Digital Technologies For Development: The Role Of Social And Cultural Structures In Influencing Experiences Of Low-Income Communities With Internet Kiosks In Uganda

Thesis

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Digital Technologies for Development: The Role of social and cultural structures in influencing experiences of low-income communities with Internet Kiosks in Uganda

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Master of Arts in International Development and Education
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Abstract

This PhD explores the complexities of the establishment and use of Internet Kiosks, a Community Technology Centre (CTC) intervention in two urban low-income communities in Uganda. The past twenty-five years have seen a rapid proliferation of CTCs as a way to bridge the digital divide in low-income communities in Africa. However, research shows that a significant gap between male and female access to ICT still exists where CTCs have been established due to the contextual issues within the social and cultural setting. To understand why this gap still exists, I investigate the complexities within the social and cultural context that influenced the access and utilisation of Internet Kiosks in urban low-income communities in Uganda, encompassing enablers and barriers.

Additionally, although many studies have reported on CTCs, the literature has focused on their role in bridging the digital divide and the tangible impacts such as the return on education and financial gain with little focus on intangible influences such as their role in facilitating soft skills development such as leadership skills, collaboration skills, communication skills and social elements. In this study, I present a case study account of the experiences of two urban low-income communities using Internet Kiosks in Uganda and demonstrate their impact on learning and influence on the quality of life.

Finally, CTC expansion and their relevance, the Information and Communication Technologies for Development (ICTD) literature has indicated these centres cannot continuously operate due to the mismatch between their design and the reality of the context. Thus, in this study, I demonstrate how power imbalance between different stakeholders, gender and age aspects influence sustainability and report on two crucial dimensions to understanding how CTC sustainability could be promoted: stakeholder engagement and technological design.

This PhD utilised a sociocultural perspective to understand participants’ lives and a qualitative multiple case study research design was used. The data generated was thematically analysed using an inductive approach.

The first key finding related to the access and utilisation of the Kiosks shows that complexities associated with age, gender and social structures within the social and cultural context determined who accessed the Kiosks and how they were accessed.
The second key finding related to the impact of the Kiosks shows that the Kiosks created numerous opportunities that afforded users in these urban low-income communities new learning opportunities, better communication, new income possibilities and soft skills development. The data also shows the Kiosks became social spaces that nurtured a sense of belonging within their communities. However, the data also indicates that some limitations were associated with them, in particular the possibility of children being exposed to unsuitable content for their age and young people encountering bullying and harassment at the Kiosks.

The third finding related to the sustainability of the Kiosks is that the asymmetrical power relations between different stakeholders influenced stakeholder engagement and technological design, which led to a mismatch between the design and the reality of the context, thereby affecting sustainability. In summary, this thesis illustrates how the specific social and cultural contexts within these two urban low-income communities in Uganda influences CTC access, impact, and sustainability.

The findings in this thesis also led to the development of a proposed framework, Context Complexities, a tool to guide CTC design, implementation, and evaluation in low-income communities in Uganda and similar low-income communities in Sub-Saharan Africa.
Dedication

This thesis is dedicated to improving the lives of low-income communities in Uganda.
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Declaration of Authorship

I declare that the work contained within this PhD is my own. Work that has been prepared for publication to date is listed below.

While the work being prepared for publication has multiple authors, I have been solely responsible for the research design, data generation, analysis, and write-up. My supervisors contributed through reflection, suggestions, and comments on draft copies of the manuscript.

Reference to Relevant Work

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‘There is no greater education than one that is self-driven’

Neil deGrasse Tyson
1. Chapter 1: Introduction

1.1. Research Motivation

Improving educational experiences in Sub-Saharan Africa to enhance the quality of life of low-income communities is an objective that I hold deeply on a personal level due to my educational experiences in Uganda. I partly grew up in Uganda and lived there for most of my childhood. In 1997, my family moved to a rural town, Gulu, in Northern Uganda. I joined a private primary school considered to be the best in town at the time. Despite holding this reputation, this school still faced infrastructural challenges like government schools. The classrooms for the lower primary level had grass-thatched roofs, and the walls were made of mud. The classes had no openings for windows, they only had a space created for entry and exit but the doors were missing. Due to this, the classes had poor ventilation and were always dark with no electricity provision. Our desks were arranged in rows and columns with no spaces between the rows but with a little space between the columns to allow the teacher to move around. Although the seating capacity of the desks was for two people, we sat three to four people per desk to accommodate everyone. The classrooms had no floors and were dusty during the dry season and muddy in the wet season.

The higher primary classes were a bit more advanced with brick walls, cemented floors, and ventilation as openings for windows were created but the doors and windows were still missing. When it rained, the roofs leaked, and the winds pushed the rain into the classrooms through those created openings for windows and doors resulting in flooding. To avoid seating at the back of an overcrowded classroom, I always reported early on the first day of the school term to secure a seat at the front desks. The school also had limited learning materials; for example, teachers had only one textbook to illustrate what they were teaching. I was fortunate that my parents bought me a few textbooks that I used with other students during the teacher illustrations as many could not afford them. It was extremely challenging to acquire an education in such conditions, and I often wished an alternative existed. The situation in government schools was worse; I had a few friends who described to me that in addition to the poor infrastructure, overcrowded classrooms, and insufficient learning materials, they lacked water in school and faced a consistent challenge of teacher absenteeism. These friends often borrowed our books so they could copy notes that they did not learn during the term, as these were examined in the end term assessment regardless of whether their teachers taught them or not. Besides, the education curriculum focused on rote learning, and the knowledge gained could not be applied in solving real life challenges to improve
the quality of life. Almost two decades later, these early experiences are still the reality for many young people in low-income contexts in Africa. I feel fortunate and grateful that I got an opportunity to attend university up to a Masters level through the generosity of a well-wisher who believed in me and got a chance to pursue a PhD through the generosity of Leverhulme Trust and the Open University. As a result, having a higher education qualification opened opportunities that enabled me to improve the quality of my life and my family's life. However, many young people from low-income communities in Uganda like myself do not have the opportunity to go beyond secondary school and, as a result, are not positioned to access opportunities that would enable them to improve on the quality of their life. Due to these personal experiences, I became committed to improving learning experiences of young people in low-income contexts to enable them to improve on the quality of their life. As many low-income communities cannot afford higher education, I focus on alternative pathways that could support them to improve their quality of life. This PhD research aimed to contribute to this objective by examining how two solar-powered Internet Kiosks provided two urban low-income communities in Uganda with an opportunity that afforded them new learning opportunities and income possibilities, thereby influencing their quality of life.

I chose Uganda as my research context due to my personal experiences with its education system and my in-depth knowledge of the local research setting and culture. In qualitative research, it has been widely emphasised that understanding the research context's social, cultural, and political environment is vital in understanding the participants under study (Lincoln and Guba, 1985; Rice and Ezzy, 1999; Papadopoulos and Lees, 2002; Creswell and Poth, 2018). I also understand and speak the local language, Luganda. Besides being a communication tool, knowledge of the local language has been identified as an essential instrument in establishing credibility in the eyes of participants (Chen and Boore, 2010; Khupe, 2017). These experiences provided me with an in-depth understanding of the nuances of this PhD study's social and cultural context. I saw this as critical in establishing relationships and gaining the trust of the low-income communities where the research took place.

To give a sense of these contexts to the reader, this chapter provides a detailed account of the educational inequalities in Sub-Saharan Africa and focused on Uganda's situation with a particular focus on soft skills development. I also highlight the quality of life of low-income communities in Uganda and the challenges they face to provide the reader with a background understanding of the life experiences of these communities. To provide the reader with an understanding of how the guiding ideas for this PhD research
emerged, a brief history of Community Technology Centres and how they support low-income communities is provided. Additionally, I highlight the gaps in the literature that this PhD aimed to address and establish the research questions for this study. I also define the key terms used in this PhD and describe the research setting. Moreover, I present my positionality to be transparent and explore ways in which my involvement may have influenced and informed this research. Finally, I present a detailed description of the structure of this thesis.

1.2. Research Context

The last few decades have seen an increased effort and commitment towards the provision of education to all children globally. These efforts entailed the Education for All (EFA) strategy established in Jomtien in 1990 that focused on provision of education by building more schools and universalising access by eliminating or subsidising school fees (UNESCO, 1990). Although primary school enrolment rates increased five times faster in Sub-Saharan Africa between 1990 and 2007 compared to between 1975 and 1990 (UNESCO, 2010), concerns about the quality of education emerged particularly in students’ literacy and numeracy achievements (Buckler, 2015). This led to the Millennium Development Goals (MDGs) adopted at the World Education Forum in Dakar in 2000 which reaffirmed to meet learning needs for all children, youth, and adults by 2015 (UNESCO, 2000). Although school enrolments increased in Sub-Saharan Africa, the data showed large disparities in enrolment still existed as the population expanded with a majority of out of school children being girls at 48% and boys at 37% (UN DESA, 2016). It also became challenging to sustain a parallel growth in the number of qualified teachers to maintain reasonable class sizes (Wagner, 2014). This challenge contributed to school enrolments not producing the anticipated learning outcomes (Barrett, 2011; Bold et al., 2017). These critical insights led to re-shaping of education targets within the current Sustainable Development Goals (SDGs) adopted in New York in 2015 (UN, 2015). The SDG target for education (SDG 4) shifted from the narrow focus on universal primary education in the MDG to a wider target on all levels of education while emphasising inclusion, quality, and equality (Unterhalter, 2019).

Despite these efforts, numerous challenges still exist including the “learning crisis” (World Bank, 2018, p.3). Although more children are attending school, data from UNESCO Institute of Statistics shows that 617 million children globally are not achieving minimum proficiency levels in literacy and numeracy with the highest number of 202 million children in African countries (UIS, 2017). Dixon (2019) points out that without these basic skills, millions of children reach young adulthood without knowing how to perform basic tasks such as calculating the correct change from a transaction, reading a doctor’s
instruction, or even understanding a bus schedule. Although the reasons for these low learning outcomes are complex, the literature suggests that shortage in resources to train enough teachers to meet the growing enrolment demand and a lack of basic resources to support formal education are key aspects contributing to the low learning outcomes (Anamuah-Mensah and Cullen, 2013; Buckler, 2015; Bold et al., 2017a; Moon and Villet, 2017; Gruijters and Behrman, 2020). Due to these challenges, many children lack basic literacy and numeracy skills even after several years of attending school (Bold et al., 2017a). In addition to technical skills such as literacy and numeracy that are at the heart of the learning crisis narrative, the inclusion of a breadth of soft skills also known as 21st century skills in SDG 4 have been emphasised as an important component of education in the rapidly changing labour market (ILO, 2017; Joynes et al., 2019; Caggiano et al., 2020). These skills have been identified to prepare individuals for lifelong learning and comprise of a broad array of competencies including computer literacy, collaboration, confidence, interpersonal and communication skills, critical thinking, creativity, decision-making, resilience, and problem-solving skills (UNESCO, 2016a; Joynes et al., 2019). It has been highlighted that these skills extend beyond the work environment by providing individuals with competencies that enable them to translate knowledge into useful practical action that impact all areas of their lives (Krautzel, 2016; Reece and Reece, 2016), thereby leading to an improvement in their quality of life (Dean, 2017; Joynes et al., 2019). Although many countries in Sub-Saharan Africa acknowledge the importance of soft skills in their public policy (Care et al., 2016), little evidence exists of how these skills have been integrated into the education curriculum in practice (Kim et al., 2019).

The second aspect to this discussion is related to the high number of out of school children in Sub-Saharan Africa. The data highlights that countries in Sub-Saharan Africa still have the highest number of out of school rates for all school age groups (32 million out of 59 million primary school age and 28 million out of 62 million adolescents) (UIS, 2019). The CREATE programme identified different patterns of exclusion from educational access defining them as “Zones of Exclusion”2 (Lewin, 2009, p.155). Key aspects that influence these different patterns of exclusion vary including poverty (Adam et al., 2016), households’ income-earning potential, child labour, parental perceptions towards education (Keiko et al., 2015), gender and racial discrimination, school costs, geographical obstacles, lack of accessibility, and

---

2 Zone 0- no pre-school access; Zone 1- children who never enrol; Zone 2- primary dropouts; Zone 3- over-age children, irregular attenders and low-achievers at primary level who are ‘silently excluded’ and learn little; Zone 4- primary leavers not entering secondary; Zone 5- secondary dropouts; Zone 6- over-age children, irregular attenders, low-achievers and those silently excluded at secondary level” (Lewin, 2009, p.156)
emergency situations caused by conflicts, natural disasters, and statelessness (UNESCO, 2017).

Due to these deficiencies facing formal education, non-formal and informal learning opportunities have become a core component of knowledge acquisition and livelihood improvement in Sub-Saharan Africa (Yasunaga, 2014; Karani and Preece, 2020). Besides, Information Communication Technology for Development (ICTD) has for a long time been associated with efforts to bridge education inequalities, and as such, having the potential to contribute to SDG 4 (Jordan, 2020). To examine this further, I focus on Uganda as the case-study country for this PhD research. The challenges Uganda faces are broadly comparable to many other countries in Sub-Saharan Africa, but the context is also important, and that is why I chose Uganda as I have personal experience with its education system and in-depth knowledge of the local context, culture, and language. The next section provides a brief context of the education system in Uganda with a particular focus on soft skills development.

1.3. Country Context: Uganda

Uganda is a low-income country in East Africa with a GDP per capita equal to approximately three percent of the global average GDP (Datzberger, 2018; World Bank, 2020). Formal education lies in the heart of the country’s development strategy and is perceived as one of the key driving factors to social and economic development (Datzberger, 2018). To meet the global education goals discussed above (see section 1.2), Uganda implemented Universal Primary Education (UPE) in 1997 (UNICEF, 2014; Ainebyoona, 2016) and Universal Secondary Education (USE) in 2007 (MoES Uganda, 2007; MoICT, 2016). The country also incorporated the SDGs in its second National Development Plan (NDP II) (2015/16-2019/20), outlining education as a key component to human capital development (GOU, 2015). Although these reforms in education yielded some results, Allen et al (2016) and Datzberger (2018) highlight that the current education system neither meets the needs of Ugandans in supporting them to improve their quality of life nor is it responsive to the social, economic, and political issues the country faces. Additionally, a symposium report published in 2017 outlined the education system in Uganda focused on memorisation of information, neglecting the soft skills competencies (LGIHE, 2017).

This focus on memorisation of information assumes that all individuals require the same knowledge to tackle life challenges (Mitana et al., 2018). However, each individual faces their own dynamic situation that requires multiple skills, including technical and soft skills, to enable them “effectively navigate their environment, work well with others, perform well and achieve their goals” (Lippman et al., 2015, p.15). While Uganda outlined in its second national development plan an objective to include the provision of
soft skills and livelihood activities to support youth in order to achieve the SDG 4 agenda (GOU, 2015), there is no clear indication of how this objective will be attained. Vandenbroucke et al (2020) argue that although Uganda has developed policies in line with the SDG agenda, many policy strategies are not or partially implemented in practice. Another critical issue relevant to this research is the massive disparity between the national policy and targets and the reality on the ground (ISER, 2019; Vandenbroucke et al., 2020).

Despite Uganda’s elaborate alignment of the national formal education policies with global educational goals, the country still exhibits one of the highest school dropout rates at primary level globally at 65% (UIS, 2016a). Out of those students who progress to secondary school, only 6% complete upper secondary education (UBOS, 2017). As illustrated previously (see section 1.2), the patterns of exclusion and the reasons for dropout are complex. However, contrary to claims that the UPE and USE programmes are free (at point of use), they have never been entirely free (Omoeva and Gale, 2016; Mutegeki, 2019). Hidden costs which parents must pay exist (Mwesigwa, 2015). For instance, parents are required to pay for examinations and monthly teacher fees, buy uniforms, learning materials, including textbooks in some cases and other materials unrelated to learning (for example, tissues, towels, brooms and in some cases bricks for classroom construction) and provide or pay for their children’s lunch (Mwesigwa, 2015). In some instances, children attempt to help their parents by earning money themselves, however earning becomes a higher priority, and eventually, they drop out of school (UNICEF, 2014; Nabugoomu, 2019).

Even with the efforts of the Ugandan government in expanding schooling opportunities and increasing school enrolments, a growing body of literature shows that many young people are passing through primary school without acquiring basic skills (Jones, 2016; Bold et al., 2017; World Bank, 2019). This is substantiated by Uwezo, a national organisation that conducts learning assessments on young people’s literacy and numeracy competence in East Africa (Uwezo, 2015). In its latest report on learning outcomes in Uganda, Uwezo found that among young people enrolled in government primary schools (primary three to seven), only three out of ten (32%) could read a primary two English story and perform primary two division (Uwezo, 2015). Additionally, only one in every eight (13%) had a primary two literacy and numeracy skill level among primary three children, and only one in every ten (10%) could read a primary two-level local language story. In primary seven, the final year of primary education, only one in every four (25%) had the minimum skill level for primary two literacy and numeracy (Uwezo, 2015). The report found that young people in low fee-paying private schools had a higher learning outcome slightly
compared to those in government schools (Uwezo, 2015). However, they still did not achieve the required minimum proficiency level in literacy and numeracy.

In an attempt to tackle these low learning outcomes, Uganda formulated a new curriculum (World Bank, 2019). However, this curriculum reform was not matched with the development and distribution of learning and teaching resources (Tromp and Datzberger, 2019). Many schools in Uganda lack basic infrastructure and resources to implement this new curriculum including a lack of access to safe water, and some have no toilets for girls (Tromp and Datzberger, 2019; World Bank, 2019; New Vision, 2020). Additionally, in many schools the class sizes are still huge, and the ratio of students to teachers is high (UIS, 2016b). The latest data from the Ministry of Education and Sports showed that the teacher-pupil classroom ratio in primary schools in Uganda was 1 teacher to 63 pupils in 2015 (MoES Uganda, 2017) and the teacher-student ratio in secondary schools not any better with an average of 1 teacher to 60 students (Evarist, 2018). This is far above the recommended international guideline ratio of 40:1 (UNESCO, 2016). Numerous schools lack the necessary learning and teaching resources, and many children cannot afford to buy instructional materials such as textbooks to fill this gap (Oryema and Picho, 2015; Malunda and Atwebembeire, 2018).

This evidence shows complex educational inequalities exist within the education system in Uganda, and it is unclear what role formal education plays in bridging these inequalities (Datzberger, 2018). The current changing environment needs a range of skills beyond the technical skills acquired through memorisation (Dean, 2017). This has led to a heightened emphasis on the content learnt in school to match what is required in the job market (Simeon-Fayomi et al., 2018). However, the current education system in Uganda is focused on memorised knowledge and does not equip young people with soft skills required to tackle challenges faced outside school (Datzberger, 2018; Mitana et al., 2018). Due to this, a growing number of youth from low-income communities in Uganda cannot secure employment, thereby are unable to improve the quality of their life (Alfonsi et al., 2020).

1.4. The Problem

African cities have been characterised by a high prevalence of densely populated areas and informal settlements that have emerged due to the absence of infrastructure, services, and the lack of job opportunities in rural Africa (UN-Habitat, 2020). In the quest to access these services and improve living conditions, many people in rural Africa have rapidly migrated to urban areas (Dodman et al., 2017; OECD, 2020). However, due to the existing weak urbanisation strategic planning, a large proportion of
the population live in congested areas and informal settlements with poorly developed infrastructure and services such as electricity, education, health facilities, roads, water supply and drainage (UN-Habitat, 2020). According to UN-Habitat (2020), Uganda has one of the highest urban populations (23.6%; 10,525,083 as of 2018) in Africa and continues to rapidly grow at 5.7 percent per year (approximately 300,000 people per year). A large share of this population lives in Central Uganda (35%) which is the location where this PhD research was conducted, with the highest concentration living in congested and informal settlements with poor living conditions (World Bank, 2015).

This rural-urban migration has facilitated some economic prospects; however, urban low-income communities still face several challenges. The key ones being the poor educational outcomes, thereby affecting their ability to be employed and become self-sustained (Renzaho et al., 2016) and high youth (18-30-year-old) unemployment rates (World Bank, 2015; Renzaho et al., 2020). Research indicates that these challenges have forced urban low-income youth to obtain money through illegal mechanisms such as selling drugs and engaging in crime such as theft and violence, and risky behaviour such as drug and alcohol abuse and gambling (Renzaho et al., 2018; Kamara et al., 2019).

To address some of the challenges discussed above, non-formal learning environments have played an essential role in providing spaces to develop soft skills that enable urban low-income youth to navigate practical life tasks and improve their quality of life (Yasunaga, 2014; Karani and Preece, 2020). In part, this has been through the penetration of the use of Information Communication and Technologies (ICTs) in low-income communities. In the last fifteen years, Africa has experienced a phenomenal growth in ICT adoption and Internet connectivity due to the expansive mobile technologies’ diffusion (Asongu and Le Roux, 2017; World Bank, 2017a; Asongu et al., 2019). This has led to the development of various sectors, including agriculture (Irungu et al., 2015; Baumuller, 2016; Emeana et al., 2020), healthcare (Abandu and Kivunike, 2017; Lee et al., 2017; Anstey Watkins et al., 2018), education (Joyce-Gibbons et al., 2018; Ngesi et al., 2018; Traxler, 2018) and the mobile money industry (World Bank, 2017a; Bahrini and Qaffas, 2019).

Despite these advances in mobile technology, a key challenge to many low-income communities owning a smartphone is the inability to afford data (GSMA, 2017). Due to this, the extent of mobile penetration remains unequal and stratified across income, education levels, gender, and geographical location (ITU, 2018). To bridge this inequality, low-income communities have been introduced to ICTs through Community Technology Centres (CTCs). CTCs are locally managed public access computers with Internet and, in some cases, have training facilities for “disadvantaged populations that would otherwise
not have such access” (Servon and Nelson, 2001, p.280). They have received considerable attention from both scholars and practitioners due to their relevance in bridging the digital divide in low-income communities where individual access to ICT was too costly (Wamuyu, 2017; Furuholt and Sæbø, 2018; Nemer, 2018a; Faroqi et al., 2019). Most studies on CTCs have focused on their positive benefits in relation to developing ICT skills and access to relevant information on education, employment, e-government services, health, current political and social affairs, and online communication with peers (Nemer, 2016; Wamuyu, 2017). To examine this further, the next section provides a brief overview of CTCs to show how the guiding ideas for exploring research questions for this PhD were determined.

1.5. Community Technology Centres

According to Molnár and Karvalics (2002), the first Community Technology Centre (CTC) was founded in 1983 in Harlem, USA, to provide ICT training to bridge the divide between low-income and high-income Americans. However, the concept of offering spaces for communities to access ICT is dated back to the first telecentres established in Vemdalem and Harjedalen, Sweden in 1985 (Molnár and Karvalics, 2002; Parkinson, 2005). Molnár and Karvalics (2002) point out that ten years after the first CTC initiation, the number of CTCs grew in Europe, noting an emergence of two types of CTCs. The Scandinavian concept with a specific social objective and the Anglo-Saxon model with a profit-driven motive. Governments in many Global North countries adopted both CTC models. Oestmann and Dymond (2001) reported that by 1994 more than 230 CTCs were built across Australia, Austria, Canada, Denmark, Finland, Germany, Hungary, Ireland, Japan, Norway, Sweden, the UK, and USA.

In the 1990s, International Organisations and Non-Governmental Organisations (NGOs) adopted the Scandinavian model introducing them to communities in the Global South, providing them with access to information on education and health, farming products and government services (Avgerou, 2008; Rega, 2010). In Sub-Saharan Africa, CTCs were introduced through the Acacia programme, a CTC intervention initiated in 1997 by the International Development Research Centre (IDRC) in partnership with International Telecommunication Union (ITU) and UNESCO (Ojo, 2005). In the first pilot phase of the programme between 1997 to 2000, a total of 35 CTCs were built in Benin, Mali, Mozambique, Senegal, South Africa and Uganda which provided ICT resources, training and outreach programmes to the local communities (Mayanja, 2001; Ojo, 2005). In Uganda, the first CTC under this programme was built in Nakaseke, Kampala and became functional in 1999 (Ojo, 2005).
Several studies assessing CTCs have reported that these spaces create better opportunities for low-income communities providing them with online resources that helped bridge formal educational deficiencies (Mitra and Dangwal, 2010; Dangwal et al., 2014) and access to information, e-government services and ICT skills (Wamuyu, 2017; Furuholt and Sæbø, 2018). Studies have also indicated that CTCs facilitate self-development (Osman and Tanner, 2017; Tabassum et al., 2019), economic impact (Abiodun et al., 2017) and have become social spaces that help address community problems (Nemer, 2018).

However, little is known about the impact of CTCs on low-income communities concerning the opportunities and limitations they bring and their influence on the quality of life. In particular, their role in facilitating the development of soft skills in relation to SDG 4 remains under-explored. At the same time, little is known about the enablers and barriers within the local context that influence the access and utilisation of CTCs in Sub-Saharan Africa. The issue of sustainability also remains a focus of great attention and has been analysed by various researchers (e.g., Heeks, 2008; 2018; Walton and Heeks, 2011; Sharma and Ray, 2019). CTCs face the issue of financial sustainability, like many ICTD interventions that fade away after external financial and technical support ends (Heeks, 2009; 2018; Pade-Khene and Lannon, 2017). Yet, limited explanation exists about how sustainability can be best attained (Sahay and Mukherjee, 2017).

1.6. Research Aims and Questions

This PhD aimed to understand the impact of two CTCs known in this research as 'Internet Kiosks' or more simply 'Kiosks' in two urban low-income communities in Uganda. The focus of this research was on Internet Kiosks due to my personal experience researching the School in the Cloud, a CTC intervention that emerged from the Hole-in-the Wall project which embedded internet computers in public walls in India. More explanation about this intervention is explained in the next chapter. This experience and research findings motivated my interest in conducting further research in this area in a context that I have an in-depth understanding of the social and cultural setting as described above (see section 1.1).

The research questions were informed by a review of the literature on CTC interventions, digital divide, ICT opportunities and limitations, and sustainability of ICTD interventions. The specific research questions addressed were:

RQ1: What contextual factors influence access and utilisation of the Kiosks at the two sites in Uganda?
**RQ2:** What are the perceptions of the impact of the Kiosks on users (young people and adults) at the two sites in Uganda?

**RQ3:** What aspects are crucial in promoting the sustainability of the Kiosks and similar CTC interventions in low-income contexts?

This PhD thesis aimed to:

- Provide detailed insights into understanding the enablers and barriers influencing access and utilisation of the Kiosks by different user groups (Chapter 6).
- Understand the perceptions of the impact of the Kiosks on young people and adults in two urban low-income communities in Uganda (Chapter 7).
- Understand the dynamic factors that influence the sustainability of the Kiosks in Uganda (Chapter 8).

To understand more about the perspectives of participants in this PhD, I utilised the sociocultural lens to explore the sociocultural elements of participants' lives to establish how the social and cultural setting influenced people's perceptions and activities. In addition, the postcolonial framing was utilised as a complementary theoretical framing in the data analysis to deeply understand power relations particularly with regards to the issue of ICTD sustainability as this has not been fully conceptualised within the sociocultural perspective. To operationalise the sociocultural framing, I adopted a qualitative multiple case study research design as the most appropriate approach for this research. It facilitated the exploration of participants' perceptions and meaning-making processes, both individually and collectively. This approach enabled me to identify similarities and differences between participants and the Kiosks through the diverse perspectives of participants at each Kiosk. The data generated from the multiple case-study was thematically analysed using an inductive approach. To provide the reader with an understanding of the key terms used in this PhD research, I define the key terms used in the next section.

### 1.7. Key terms and definitions

Information Communication Technology (ICT) in this research refers to technological tools and resources used to communicate, create, store, and disseminate information (Blurton, 2002). ICTs entail both physical technologies such as the Internet, computers, mobile devices, telephone, radio and television, and software such as applications and digital interfaces including social media (Kao, 2013).
ICT for Development (ICTD) is a research acronym in international development concerned with the use of ICT in the Global South (Walsham, 2017). Global South is a term used by the World Bank and other organisations to refer to low and middle-income countries in Africa, Asia, Latin America, and the Caribbean replacing the preceding terms of ‘Third World’ and ‘Developing Countries’ (Hollington et al., 2015). Although the term is still contested, I use it in preference of previous terms that undermined countries outside Europe, North America, and Australasia. On the other hand, Global North refers to what was previously known as developed countries in Europe, North America, Australia, and a few countries in Asia such as Japan, South Korea, and Singapore (Trefzer et al., 2014).

In this research, the term education broadly refers to formal and non-formal learning programmes and experiences for young people both enrolled in school and those who have dropped out of school, teachers, and adults in some form of education. The focus in this research on learning is not limited to the access to schooling and acquisition of knowledge and skills in a formal education environment but instead changes in individuals’ practices, behaviour, and attitude due to an external environmental interaction (Lachman, 1997; Illeris, 2014). Based on the literature, formal learning is the content learnt in school and is structured (Tamir, 1990; Gerber et al., 2001). It entails a systematic, organised and time-restricted assessment driven curriculum and instructional system delivered by teachers within a country (Caldana et al., 2021; Viberg et al., 2021). In contrast, informal learning is unplanned and unstructured and occurs spontaneously in daily activities (Livingston, 2001; Eshach, 2007). On the other hand, non-formal learning is intentional learning that occurs in situations beyond formal learning settings and is mediated with formal education tools (Eshach, 2007). Werquin (2007) outlines that non-formal learning is in the intermediate position between formal and informal learning.

The diffusion of various ICTD initiatives within the continent has influenced and enhanced informal and non-formal learning opportunities (Latchem, 2016). An example of a prominent non-formal learning environment is the Khan Academy, a non-profit educational organisation that provides free educational resources for anyone globally in majority of the subjects taught in school (Khan Academy, 2015). Another example is OpenLearn, the Open University’s website for Open Educational Resources which enables informal learners to access numerous online courses on various subjects accessed by over three million people per year (Weller et al., 2015).

Impact is a crucial focus for this research and a wide variety of definitions are used in the development sector (Hearn and Buffardi, 2016). In this research, I apply the description of impact as defined by the United Nations Development Group as follows “a change in people’s lives. This might include changes
in knowledge, skills, behaviour, health or living conditions for children, adults, families, or communities” (United Nations Development Group, 2011, p.7). In assessing impact, this research focuses on both tangible and intangible impacts. Tangible impacts are defined as quantifiable elements in terms of their value, for example, assessable return on education, financial gain, and job opportunities creation (Tabassum and Yeo, 2015; Nemer, 2018a). On the other hand, intangible impacts refer to perceived non-quantifiable gains such as the impact on soft skills development such as digital literacy, collaboration, self-esteem, confidence, communication skills, problem-solving, creativity and decision-making and social elements (Gomez and Pather, 2012; Tabassum and Yeo, 2015; Nemer, 2018a; Pandey and Gupta, 2018). Researchers such as Gomez et al. (2013) and Tabassum and Yeo (2015) highlight that it is difficult to quantify the value of intangible impacts particularly when assessing the impact of ICTD interventions, mainly due to how this data can be collected while focusing on the community’s perspectives. Mthoko and Khene (2015) suggest using a participatory approach that utilises learnings from previous trials rather than using predefined indicators. Utilising predefined measures will not cater for the diverse emergent impacts from the community perspective, therefore utilising story-based approach has been suggested as the best approach to capture the richness of the data (Tabassum and Yeo, 2015; Tabassum et al., 2019).

Soft skills refer to non-technical competencies that enable individuals to develop psychological, emotional, behavioural, and resilience skills to effectively negotiate life’s daily demands and challenges (WHO, 1994; Desai, 2010; Galagali, 2011; Sekhar, 2019). These skills include self-directed learning, creative thinking, problem-solving, leadership and communication skills (Sekhar, 2019). While a diverse range of definitions for literacy exists, in this research, I apply a sociocultural perspective to defining literacy as “social practices and conceptions of reading and writing” (Street, 1984, p.1). Although there are many definitions of computer literacy, I refer to the one provided by Son et al. (2011), who define computer literacy as “the ability to use computers at an adequate level for creation, communication and collaboration in a literate society” (p.27). The digital divide generally refers to the gaps between those who have access to ICTs and those that do not have access (Van Dijk, 2017). However, the literature has identified different levels of digital divides that will be discussed later.

In the education literature, the concept of access is complex and has several meanings. However, it is often referred to mean inclusive approaches to education to increase enrolments and attendance and eliminating all forms of discrimination within the education system (Booth and Ainscow, 2016; Bombardeli, 2020). In the context of this PhD, I use the term ‘access’ to refer to access to digital resources by different ICTD user groups to highlight the existing inequalities in utilisation.
Now that the key terms in this research have been defined and established, the next section discusses the research setting for this PhD.

1.8. Research Setting

This PhD research was conducted at two urban low-income communities in Central Uganda where Skills to Survive [pseudonym], a UK based organisation, had built two outdoor solar-powered Internet Kiosks with educational software. One Kiosk [Kiosk A] was located within a low-cost private primary school [Hillside school] and the other [Kiosk B] in a busy market area. These Kiosks were established in October 2015 to address the educational deficits in these low-income contexts (Skills to Survive ³, 2017). The founder of Skills to Survive was inspired by a TED talk in 2013 on the research that was conducted at the 'Hole in the Wall' centres in India by Professor Sugata Mitra between 1999 to 2006 (see section 2.1). Inspired by this research, Skills to Survive progressed to establish a similar project in a different context and setting (Skills to Survive⁴, 2019).

Skills to Survive partnered with a local organisation, Helping Hands [pseudonym] that was already working with the local communities where the Kiosks were intended to be established as they had prior knowledge of the context and communities. This made penetration into these communities easy since a relationship between Helping Hands and the local communities already existed. Helping Hands staff played a key role in preliminary community work, organising logistics and supporting the Kiosks' construction activities. Additionally, Skills to Survive partnered with a telecommunication company to provide wireless internet for the Kiosks. Four Kiosks comprising of internet-enabled computers and WiFi were built in four locations in Central and Western Uganda. Each Kiosk had two computers, with one side having a lowered computer screen, intended for young children to access easily and the other side of the Kiosk had a higher screen, intended for older children and adults. The computers also had charging ports, and a WiFi hotspot was also provided for people who had their own mobile devices to access free Internet.

As indicated earlier, the interest in examining the Kiosks in Uganda was informed by findings from the School in the Cloud facility in India. This experience led to my commitment in furthering this research in a context that I was comprehensively knowledgeable about and it was through my search for similar interventions in East Africa that I came across Skills to Survive who had established a similar intervention

³ Reference hidden to protect organisation’s privacy
⁴ As above
in Uganda. I contacted Skills to Survive, introduced my research proposal to them, and received interest in participating in the study (see section 3.6 for more details on how the relationship was built). Skills to Survive had established four Kiosks in Uganda (two in Central Uganda and two in Western Uganda). This PhD research examined the two Kiosks in Central Uganda.

1.9. Reflexivity

As this research is predominantly a qualitative study, it is important to be clear about my positionality as a researcher and the series of choices I made. A reflexive approach was taken, one in which the researcher discusses honestly and transparently what choices and decisions were made, how and why certain actions were taken to establish rigour for the reader to understand the degree of involvement and assess its probable influence on findings (Webb, 1992). Writing in the third person is a linguistic tool to demonstrate objectivity in research and as such is inconsistent with the interpretive approach underpinning this PhD research (Webb, 1992; Hall and Stevens, 1991; Sandelowski, 1986). The researcher is part of the study and in fact the research instrument (Erickson et.al., 2016) and it is for this reason that I have made a conscious decision to write in the first-person (I) rather than the third person (the researcher) in this thesis.

As part of establishing my reflexivity, it is essential to be clear about my prior knowledge, experience, and connection to this context so that the reader can understand some of the influences on, and choices made about the implementation of this research. The data generation and analysis were solely undertaken by myself and therefore my reflexivity will have certainly influenced the data interpretation. Reflexivity is therefore a critical aspect for all phases of the research process (Guillemin and Gillam, 2004; Bradbury-Jones, 2007; Bourke, 2014).

As established above, I partly grew up in Uganda. Although, as a child, I initially found the transition of moving to a rural town in Uganda challenging, I quickly adjusted and learnt the local language, Acholi, through my interactions with other children at school and the local culture by engaging with the wider community. When I joined a boarding school in Kampala, I interacted with more local tribes including the Baganda and learnt Luganda the local language as a subject in school and practiced it with peers and the local community during my school holidays. I immersed myself in the Buganda culture through engaging in school cultural activities and blending with the local community during my school holidays. I lived there for six years while pursuing my secondary education. This element of my positionality influenced this thesis as this enabled participants to become comfortable being open with me and
perceived me as an insider compared to a person who did not have this in-depth understanding of the context.

Prior to this PhD, I worked for various charity organisations implementing educational programmes in low-income communities in rural Kenya. Additionally, I conducted research in similar contexts to this PhD research in informal settlements in Nairobi and rural India. In addition, my prior experience with the research context and similar environments, my education training in international development and education contributed to my knowledge of the issues facing low-income contexts in the Global South.

1.10. Thesis Structure
Initially, this PhD will focus on presenting a detailed overview of the research context and establishing how the literature informed development of the research questions as well as detailing the theoretical approach and research design. Subsequent chapters will then present findings to address each research question, highlighting the specific contributions to knowledge. The final chapter draws together the findings of this PhD and extends the insights of the conclusions in the findings chapters, including identification of areas that need further exploration. A more detailed explanation of the thesis structure is provided below.

Chapter 2: Literature review
This chapter reviews and analyses empirical literature on Community Technology Centres (CTCs) in low-income communities in the Global South and seeks to understand existing digital divides where CTCs have been established. It also seeks to understand opportunities and limitations concerning young people’s use of ICT. Furthermore, it examines the literature on sustainability of ICT for Development, focusing on CTCs, explicitly examining issues that affected four critical aspects of sustainability and critically assesses the principles for digital development in relation to the sustainability aspects. This chapter also reviews literature on design approaches and specifically focusses on participatory decolonising approaches. The literature reviewed in this chapter informed the development of the research questions for this PhD and how the guiding ideas for exploring these questions were determined and outlines how this PhD intended to contribute to knowledge and understanding in this area of research.

Chapter 3: Theoretical Approach and Methodology
Chapter 3 discusses the theoretical approach used to underpin the research design employed in this thesis. The research questions for this study were developed through the interpretivist epistemological lens which informed the sociocultural perspective utilised in this research and the case-study design adopted
in this study. The chapter also discusses the reasoning behind the utilisation of an additional theoretical perspective, ideas from the postcolonial approaches to deeply understand power dynamics in relation to how it influenced access, impact and sustainability. Finally, the chapter provides a detailed account of data generation methods used, the phases of research comprising of; pilot, preliminary and main studies, and ethical considerations taken.

**Chapter 4: Data Analysis**

Chapter 4 provides a detailed description to how the data for this research were analysed using thematic analysis, providing an insight to how the data were transcribed, translated, familiarised and thematic maps were developed. It also illustrates how the post-structural concepts were utilised in the analysis to deeply understand and interpret the power dynamics between the different stakeholders of this PhD study.

**Chapter 5: Background of the Kiosks and Participants**

Chapter 5 provides a background of the Kiosks and their setting for the reader to gain an understanding of the research context. The chapter describes the processes involved in setting up the Kiosks and provides a detailed narrative of each Kiosk and its organisation. It also outlines the complexities that existed within the research context, which played a crucial role in determining the Kiosks' functionality and success.

**Chapter 6: Understanding Access and Utilisation**

Chapter 6 provides a detailed narrative of the enablers and barriers that influenced the Kiosks' access and utilisation. It provides insight into how multiple complexities linked to gender, power, and social structures influenced the Kiosks' access and utilisation. Two main themes encompassing enablers and barriers emerged from the thematic analysis. The results from the thematic analysis are presented and discussed in relation to usage and utility gaps discussed in the literature.

**Chapter 7: Perceptions of Impact: Opportunities and Limitations**

Chapter 7 provides a detailed description of the opportunities that were created as a result of the Kiosks and how these opportunities brought changes in participants’ lives. The chapter also explores the limitations that emerged due to the existence of the Kiosks. Two main themes emerged from the thematic analysis encompassing opportunities and limitations. The theme of opportunities had two sub-themes comprising of learning opportunity and influence on the quality of life.
**Chapter 8: Assessing Sustainability Aspects: Understanding the Design-Reality Gaps**

Chapter 8 provides an understanding of two interrelated dimensions, stakeholder engagement and technological design and maintenance, that emerged from the data analysis as crucial to influencing sustainability. The chapter also provides suggestions for how the contextual complexities could be addressed. Finally, the chapter draws together the findings of this PhD by presenting and discussing the proposed Context Complexities framework, which resulted from the data analysis.

**Chapter 9: Conclusion**

Chapter 9 draws together the findings of this PhD and presents an overview of the contributions, highlights the implications for CTC practitioners based on the findings in chapters six to eight and discusses the limitations of this thesis. Finally, the chapter ends with a discussion on direction of future research.
Chapter 2: Literature Review

This chapter reviews and analyses the literature on Community Technology Centres in low-resource contexts in the Global South and outlines how this PhD intended to contribute to knowledge and understanding in this research area. The chapter is organised as follows: Section 2.1 reviews and analyses empirical literature on Community Technology Centres in low-income communities in the Global South and seeks to understand existing digital divides where CTCs have been established. Section 2.2 examines relevant research on opportunities and limitations concerning young people’s use of ICT.

Section 2.3 explores the literature on sustainability of ICT for Development, focusing on CTCs and examines issues that affect four critical aspects of sustainability. It also reviews existing ICTD frameworks relevant to this PhD. Section 2.4 critically assesses the principles for digital development in relation to the sustainability aspects. Section 2.5 examines design approaches that put communities at the centre of the design process, specifically focusing on participatory design. Finally, section 2.6 discusses decolonising approaches and provides guidelines to incorporating this approach into the participatory design.

2.1. Community Technology Centres in low-income contexts in the Global South

This PhD seeks to understand the impact of CTCs on low-income communities concerning the opportunities and limitations they bring and their influence on the quality of life. To do this, it is essential to understand what the literature says about the use of CTCs in other similar low-income contexts. This review begins with examining the Hole-in-the-Wall project, which inspired the Kiosks being investigated in this PhD and progresses to examine other CTC interventions in similar low-income contexts.

The Hole-in-the-Wall project is one of the best-known CTC projects focused on young people in the Global South. Professor Mitra from Newcastle University and his colleagues embedded internet-connected computers in walls in public places in India (Mitra, 2003; 2005; Mitra et al., 2005; Dangwal and Kapur, 2008), enabling access and exploratory use of the computers and internet by people who would otherwise not have access to ICT due to the digital divide (Robinson et al., 2018). The findings from the Hole-in-the-Wall project revealed that children who used these computers learnt basic computer skills (Mitra and Rana, 2001), improved English pronunciation (Mitra et al., 2003), could make sense of some of the online materials (Mitra and Dangwal, 2010), and showed improvement in their school subjects (Dangwal and Thounaojam, 2011; Dangwal et al., 2014). Mitra (2014b) argues that children were able to achieve all the above without adult intervention. Dangwal and Kapur (2008) ascribed it to
children’s intrinsic desire to make sense of their world, acknowledging the importance of ICT in their lives and learning through exploration, experience, and collaboration. Building on this research, Mitra brought the results from the Hole-in-the-Wall experiments in India to England and adapted it for use in schools and called it "Self-Organised Learning Environments (SOLEs)" (Mitra and Crawley, 2014, p.81).

Mitra introduced the ‘Granny Cloud’ in India, which entailed volunteers, mainly retired teachers who had the time and inclination to interact with children via Skype and won the TED prize ($1 Million) in 2013 (Mitra, 2013). This enabled Mitra to establish seven SOLEs (five in India and two in England) and the Granny Cloud calling them ‘School in the Cloud’ (Mitra, 2015; 2018). Mitra also developed a ‘SOLE toolkit’ with guidelines to encourage other educators to create child-led learning environments and to share their discoveries (Dolan et al., 2013; Mitra, 2014a). SOLEs are formed when educators present learners with a challenging question referred to as the ‘big question’ and encouraging them to collaboratively work as a community to address the question using the internet (Stanfield and Unlu, 2016). In SOLEs, the educator is a facilitator and plays a minimal role (Stanfield and Unlu, 2016).

Findings from the School in the Cloud facilities suggest that students initiated their learning and developed an identity (Rix and McElwee, 2016), increased their confidence and developed communication and teamwork skills (Mohamud, 2016) and improved on their reading comprehension through conducting research on the Internet (Mitra, 2019). The SOLE approach has been embraced in various locations globally (Dolan et al., 2013; Latchem, 2016). One study conducted in Greece where SOLE was used as a cost-effective approach to learning English as a Foreign Language reported that learners reduced their dependence on the teacher and managed their learning process through peer collaboration (Lymperis, 2019). However, concerns about how much information students can obtain through the SOLE approach have been raised. Paradowski (2015) argues that Google cannot provide learners with holistic learning through the big questions but instead gives them fragmented pieces of knowledge. Additionally, some critics point out concerns about the lack of clarity in the teacher’s role in SOLE and warn that the approach may lead to social exclusion leaving learners’ needs unmet, assuming that Mitra advocates for the elimination of teachers (Dellar, 2014; Harmer, 2014; Stanley, 2014). This misinterpretation in Mitra’s work exists because the focus has been on how children can teach themselves where an unavailability of resources exists. Mitra (2015) clarifies that the concept is not meant to eliminate teachers but aims to support children and teachers in low-resource contexts.

On the other hand, the literature supporting Mitra’s work emphasises the need for children to develop a range of soft skills such as collaboration, problem-solving, critical thinking, digital literacy, research,
and information synthesis skills (Mitra and Arora, 2010; Dolan et al., 2013; Mitra, 2018; Livingstone et al., 2019) as well as confidence, self-esteem, and motivation (Hatzigianni and Margetts, 2012; Humble and Dixon, 2017). Yet, how children can be supported through the creation of pathways that facilitate the attainment of these skills is to be understood. Cantor et al (2019) point out, “there is no single ‘ideal’ development pathway for everyone; instead, there are multiple pathways to healthy development, learning, academic success, and resilience” (p.315). It is implicit in this citation that numerous channels exist in skill development both in formal and non-formal education settings. To address this need, this PhD research aims to examine how the Kiosks, a non-formal context, supported young people and adults in low-income communities in Uganda to acquire soft skills.

Despite the focus on the positive benefits of CTCs outlined earlier and the emphasis on how they bridge the digital divide, research shows that there is still unequal access to ICT even where CTCs have been established (Lwoga and Chigona, 2019; Jamu, Manda and Chirwa, 2020). The challenges that contribute to this inequality are access, quality of usage, and ICT skills to navigate them (Achieng, 2017). Studies evaluating CTCs in Malawi reported that it was mostly young men with high socioeconomic status who were the primary users of the CTCs (Kapondera and Namusanya, 2017; Kapondera and Chigona, 2017). Previous studies conducted in other Global South countries including South Africa and Namibia, which are also African countries found similar results. (Gomez, 2014; Gcora et al., 2015; Abiodun et al., 2017). Gómez (2018) and Ragnedda and Ruiu (2017) outline that the digital divide exists in three levels; access gap, usage gap and utility gap. The access gap focuses on the unavailability of ICT, usage gap concentrates on who has access and the purposes of use, and the utility gap assesses the benefits of use (Ragnedda and Ruiu, 2017). Although the access gap remains a significant challenge in low-income communities in Sub-Saharan Africa (Jamu et al., 2020), this review examines the other two levels of the digital divide; usage and utility gap in more detail since this PhD’s focus is on where CTCs exist.

2.1.1. Usage Gap: Gender Digital Divide

Studies that examined usage patterns of CTCs in the Global South report that these centres do not attract diverse groups of people within the low-income communities, but rather the users are mostly relatively educated youth (Kapondera and Namusanya, 2017; Lwoga and Chigona, 2019). The question that arises is to what extent do CTCs bridge the digital divide (Kapondera and Namusanya, 2017). Research shows that a significant gender digital divide still exists in the Global South, particularly in Sub-Saharan Africa, where fewer females have access to ICT compared to their male counterparts (Philbeck, 2017; Pew Research Centre, 2018). Data from the International Communication Union shows that the digital gender
gap increased from 15.8% in 2013 to 22.8% in 2019 in the Global South, with the most significant gender digital divide in Sub-Saharan Africa (33%) (ITU, 2019). Banaji et al (2018) highlight that part of the reason for this gender digital divide is because policy and ICT interventions focus more on creating access to ICTs without recognising the existing inequalities within the context. Concerning CTC usage, this massive gender digital divide can be attributed to several factors identified in the literature which are discussed below.

Women and girls in low-income communities face several barriers that hinder them from accessing CTCs, which have been classified as individual, institutional and structural barriers (Gcora et al., 2015; Livingstone et al., 2017; Lwoga and Chigona, 2019). Studies reported that the individual challenges include lack of ICT skills, language barriers, lack of awareness and individual perceptions (Gcora et al., 2015; Lwoga and Chigona, 2019). Some studies highlight that females may experience psychological hindrances such as a lack of confidence in their ability to learn ICT and an attitude to think that ICT is reserved for males and the educated (Danjuma et al., 2015; Singh, 2017; Singh et al., 2018).

Most institutional barriers identified such as staff shortages, scarcity of resources at the CTCs, frequent electricity outage, poor maintenance, slow internet and overpopulation at the CTCs affected all users irrespective of gender (Kapondera and Namusanya, 2017; Singh, 2017; Lwoga and Chigona, 2019). However, institutional barriers such as the physical location of CTCs may be a barrier for females as they may feel uncomfortable or find the CTCs inaccessible or where social customs and safety concerns restrict their free movement (Singh, 2017; Kuroda et al., 2019). For example, Nemer's (2016) ethnographic study on CTCs in an urban favela in Brazil found that gendered social customs played a key role in determining who used the CTC spaces. Critics of the Hole-in-the-Wall project discussed earlier argue that fewer girls than boys utilised the facility, indicating that girls were not given an equal opportunity (Arora, 2010; Clark, 2013). Trucano (2010) suggests that the community had reservations for their daughters to utilise them because they were located in public spaces, which they felt were not safe for their daughters.

Women and girls also faced structural barriers encompassing gendered social and cultural norms in patriarchal societies (Alao et al., 2017; Alao, Brink and Ohei, 2021). Davaki (2018) highlights females may face intimidation and harassment in public ICT spaces such as cybercafes, CTCs or even computer labs in schools which contributes to discouraging them from using the facility. Studies also found that many parents in low-income communities in the Global South treat girls and boys differently in relation to ICT access and often do not support their daughters using ICT either because they do not see the
importance or have safety concerns (Livingstone et al., 2017; West et al., 2019). Furthermore, some studies also identified that women and girls have significant domestic and family responsibilities that take up most of their time (Banaji, 2015; Kleine, 2015; Livingstone et al., 2017). Although Singh (2017) argues that in many cases, women and girls choose those responsibilities over their personal development leading to what is known as the "leaky pipeline phenomenon" (Singh, 2017, p.245), the situation is more complex than choosing one over the other as this PhD research will demonstrate. Therefore, to support women and girls' access and participation in CTCs, the multi-dimensional socio-economic factors and cultural context must be considered (Hafkin and Jorge, 2002).

Since the 1990s, empowerment which Luttrell et al (2009) defines as "a progression that helps people gain control over their own lives and increases the capacity of people to act on issues that they themselves define as important" (p.16) became a fundamental concept in the international development agenda (Luttrell et al., 2009). Although some efforts existed to facilitate female participation in education, health, politics and labour markets prior to 2015, a political declaration adopted by UN member states acknowledged that no country globally had entirely attained equality and empowerment of women and girls (UN Women, 2015). This led to the development of a stand-alone Sustainable Development Goal (SDG) focused on Gender Equality which entails a wide range of targets including access to education, maternal health, women’s participation in politics and access to ICT to ensure the empowerment and equality of women and girls (Stuart and Woodroffe, 2016; Güney-Frahm, 2018). However, achieving the SDG 5 targets may prove difficult if the context-specific gendered social and cultural barriers women and girls face are not considered (Agarwal, 2018).

The evidence provided above in relation to women and girls’ access to CTCs has highlighted that despite providing access to ICT, women and girls still faced barriers and suggests for an in-depth focus on how women and girls can be supported to utilise CTCs. This PhD intended to go beyond merely stating the barriers women and girls faced by demonstrating the complexities within the social and cultural context and indicating how CTC implementation design indirectly or directly maintained the existence of these barriers. The PhD aims to contribute to knowledge in this area by shifting from the focus on equality and paying more attention on equity to increase the opportunities for development of women and girls in low-income communities in Uganda and the wider Sub-Saharan Africa context.

As outlined earlier, this PhD focuses on two digital divide levels in relation to CTCs; usage gap was the first one which has been discussed above. Utility gap is the second digital divide which is discussed below.
2.1.2. Utility Gap: How do CTCs benefit users?

The social and cultural background and knowledge of CTC users influences the information they search and process which represents the benefits they derive from them to improve their life chances (Ragnedda and Ruuiu, 2017). Scholars researching CTCs in Sub-Saharan Africa have mainly reported on tangible impacts, indicating their role in bridging the digital divide and enabling low-income communities to acquire ICT skills (Wamuyu, 2017; Kuika Watat, 2020), access information and e-government services (Furuholt and Sæbø, 2018) and economic benefits and job opportunities creation (Alao et al., 2017; Uys and Pather, 2020). However, a few studies have reported on the intangible impacts of CTCs such as self-esteem, self-belief, and personal development (Osman and Tanner, 2017; Tabassum et al., 2019; Uys and Pather, 2020) and their role in providing a social space to tackle community problems (Nemer, 2018a). The literature shows there is still a gap in assessing these intangible impacts, also known as soft skills, particularly in the African context (Osman and Tanner, 2017). This PhD aimed to contribute to knowledge in this area by providing evidence that will inform how low-income communities in Uganda can be supported to acquire these soft skills.

Research shows that the increased availability of ICT globally and the creation of public ICT spaces, including CTCs, pose both opportunities and limitations for users, particularly for young people (Byrne and Burton, 2017; Livingstone et al., 2017). To understand this further, the following section reviews and analyses empirical literature on opportunities and limitations concerning young people’s use of ICT.

2.2. ICT Opportunities and Limitations

As the internet revolution advances quickly, children are reported to be often curious to learn the opportunities the new technology offers them and therefore become pioneers of new ICT innovations (Livingstone and Stoilova, 2019). The digital environment has become an essential resource for children to access information on education, health, and current affairs. It offers them an opportunity for socialisation, entertainment, and the development of soft skills such as creativity, digital literacy, and digital citizenship (Livingstone et al., 2015; Swist et al., 2015; Byrne and Burton, 2017). Despite these opportunities, a growing body of international research primarily conducted in the Global North has demonstrated that with this interconnectedness and online opportunities come a range of limitations (Stoilova et al., 2016; Livingstone et al., 2016; 2017; Smahel et al., 2020). Some as a result of the new digital era, but many shaped by children's existing offline vulnerabilities, which increases their chances of encountering negative experiences online, and they may not have a support system to assist them with managing these limitations (Livingstone et al., 2018; Livingstone, 2019). Even in the Global North
context, Livingstone and Stoilova (2019) argue that a gap still exists in the data generated by international bodies like the International Telecommunications Union (ITU), a specialist department within the UN responsible for collecting ICT data on the negative experiences children encounter online.

Furthermore, Livingstone et al. (2017) emphasise that a gap in literature analysing the multifaceted factors associated with children's internet usage specifically examining online opportunities and limitations exists in the Global South. Moreover, a considerable amount of advice on online safety is directed to parents; however, not all parents have the capacity to implement the guidance, particularly in low-income contexts in the Global South (Livingstone, 2019). Parents are not in a position to implement the advice as they themselves may not understand how the technology works (UNICEF, 2017) and may not know how to read and write. Equally new technological advancements are progressing quicker than sufficient policy and regulation (Livingstone and Stoilova, 2019). For example, the General Data Protection Regulation was only implemented in May 2018 after decades of technology advancement replacing the EU Data Protection Directive established in 1995 (Livingstone et al., 2018). In Sub-Saharan Africa, the process of establishing laws on online safety has been much slower and limited in scope (Samme-Nlar, 2020). For example, in Nigeria, cybercrime laws were only passed in 2015 and little evidence exists concerning their implementation and effectiveness (Livingstone, 2018). Kenya launched a campaign called "Be the Cop" (CAK, 2018, p.1) in 2015 that aimed to raise young people's awareness of negative online experiences such as solicitation of minors, cyberbullying, identity theft, online fraud, and pornography to equip them with knowledge and skills for safe internet use. However, this campaign started implementation in 2018 through the Communications Authority of Kenya (CAK, 2018), and no data exists yet on evaluating its effectiveness. Finally, Uganda, the focus country of this PhD, has basic legislation governing the use of ICT, such as the Uganda Communications Act and the National Information Technology Authority Act, which provide guidelines for organisations, companies, and individuals (Republic of Uganda, 2013; 2014). However, no policy has yet been established, specifically focusing on children's online safety needs.

Furthermore, it has been suggested that national policies tend to assume that children's Internet access only occurs in specific monitored environments (Byrne and Burton, 2017). However, this is not always the case, particularly in the Global South, where access to the Internet for some children is more readily available in public spaces such as the CTCs discussed above. Banaji et al (2018) also argue that interventions educating children on negative online experiences are few in the Global South and are inhibited by social and cultural norms which shun away from discussing aspects such as pornography.
and sexual content with children. Due to these limitations, children are not equipped with the skills to navigate negative online experiences and therefore may be exposed to a risk of harm (Livingstone et al., 2016; Livingstone and Stoilova, 2019). Considerations to how and where children access the Internet can impact how policies that target responsible usage and online safety are designed and how they are implemented across diverse environments with internet access (Byrne and Burton, 2017), including unsupervised settings such as CTCs, the focus of this PhD. The evidence presented above has demonstrated that data on the limitations that come with ICT adoption is still lacking in the Global South. Due to this gap in data, there are few efforts focusing on educating young people on online negative experiences. This PhD aimed to generate data on ICT opportunities and limitations, specifically focusing on the CTC environment in the Ugandan context which will inform initiatives that educate children on online safety. This research also intended to offer suggestions that will inform CTC practitioners’ decisions on how they can maximise the opportunities CTCs bring and minimise limitations through their design and implementation using a context appropriate approach.

As outlined earlier, a broad consensus exists among researchers on the relevance of CTCs as a key effort in ICT diffusion and implementation in low-income communities (Gomez, 2014; Manniko-Barbutiu et al., 2017; Wamuyu, 2017; Nemer, 2018a). However, the literature shows that these facilities have been criticised for not being sustainable, particularly in the Global South context, where they are initiated by implementers external to the local communities (Faroqi et al., 2019). The following section explores the literature on the sustainability of ICTD with a focus on CTCs to understand these issues.

2.3. Sustainability of ICT for Development: Community Technology Centres

The term sustainability has evolved in the broader ICT for Development (ICTD) literature (Pade-Khene and Lannon, 2017). In this PhD, I draw on sustainability as the capacity of a project to continuously operate in the context where it was established without hampering individuals’ future opportunities to benefit from the original intervention (Pade-Khene et al., 2011). The ICTD literature identifies five key types of sustainability that influence each other; social, organisational, technological, financial and policy (Best and Kumar, 2008; Da Silva and Fernández, 2016b; Mishra and Unny R, 2018; Faroqi et al., 2019). Considering these sustainability types, this PhD focused on four types: social, organisational, technological, and financial sustainability, which were identified to be directly associated with the Kiosks being examined. These are discussed in detail in subsequent sub-sections. I refer to the wider literature on sustainability of ICTD as research specifically focusing on CTC sustainability is scarce.
2.3.1. Social sustainability

Social sustainability involves obtaining local community buy-in (Heeks, 2014; Da Silva and Fernández, 2016a; Bon et al., 2019), which can be achieved through an in-depth understanding of the local social setting and cultural practices (Baduza and Khene, 2019; Bon et al., 2019). Despite the huge emphasis on applying a context-specific approach (Winschiers-Theophilus et al., 2015; Baduza and Khene, 2015; Andoh-Baidoo, 2017) in the literature. Many authors continue to identify gaps in understanding the social and cultural contexts of the local communities where ICTD projects including CTCs are implemented which has been attributed to a lack of learning from past interventions (Heeks, 2018; Walton and Heeks, 2011; Andoh-Baidoo, 2017; Pade-Khene and Lannon, 2017; Brown and Mickelson, 2019). Heeks (2009) argues that many ICTD, including CTCs, are not sustainable because the implementing organisations and funders often focus on a quick fix of the problem without delivering a comprehensive system that will last after the organisations exit the field and the funding ends.

Hong et al (2014) argue that contextualisation involves forgoing generalisations and understanding the specific factors within a setting. It requires engaging with communities from the project initiation throughout its lifecycle to promote a people-centred approach rather than the predominant task-based approach that many ICTD interventions apply in the quest to meet donor requirements (Mthoko and Khene, 2018; Lorini et al., 2019; Pade-Khene and Lannon, 2017). The literature outlines three key aspects to consider when engaging with stakeholders (Pires and Fernández, 2016; Rose et al., 2018) as follows:

- Communicate the objectives of the ICTD interventions with stakeholders and inform them how the project will benefit them.
- Identify the specific stakeholders of the ICTD intervention and outline relationships between the various stakeholders if the project involves more than one group.
- Outline how engagement with diverse stakeholders will affect the project's outcome and what actions will be taken to manage stakeholders with conflicting interests?

However, stakeholder engagement is complex in practice due to the dynamics in the local contexts. Little guidance exists in the literature on how this complex process can be implemented, leading to confusion. One such case is described by Brown and Mickelson's (2019), who found in their assessment of a community based ICTD project in rural Nepal that the intended beneficiary community did not gain from the project since the community that was consulted was not the same as the beneficiary community. Zaman et al (2016) highlight failing to understand the local context increases the likelihood of conflicts and potential harm occurring. Due to this, the ICTD project, including CTCs, may instead bring some
unintended negative consequences (Dearden and Kleine, 2020). Furthermore, the literature highlights that power relations between the different stakeholders are often overlooked, particularly between ICTD practitioners who have control over the resources and the communities where interventions are established and, as a result, affect the outcomes of ICTD projects, including CTC interventions (Lin et al., 2015; Chipidza and Leidner, 2019). This PhD research aimed to demonstrate how power relations influence CTC interventions' social sustainability, with a specific focus on the Kiosks in Uganda.

2.3.2. Organisational sustainability

Organisational sustainability is related to the management practices, monitoring, evaluation, model choices and long-term sponsorship (Da Silva and Fernández, 2016b). This aspect is related to the social sustainability discussed above, and the literature highlights that many practitioners implementing ICTD projects, including CTCs, focus on accomplishing the task using a top-down approach without adequately engaging with the local communities to understand their needs (Singh and Flyverbom, 2016; Keijdener et al., 2018). As a result of the top-down approach, the communities' contribution is confined, limiting ownership and sustainability (Pade-Khene and Lannon, 2017; Manniko-Barbutiu et al., 2017). In one such example, Pariyar et al (2018) found in their assessment of CTCs in Malaysia using Cause and Effect Chain Analysis that the top-down approach limited youth in engaging with the offered programmes at the centre. For this reason, programme uptake was low. Mishra and Unny R (2018) highlight that organisational sustainability also encompasses providing the local community with training on operating and repairing CTC equipment. The literature suggests that this active community participation fosters local management of the ICTD project when the external implementing organisation exits the field (Harris, 2016; Manniko-Barbutiu et al., 2017). As a result, the local community management influences the long-term existence of the CTC intervention.

2.3.3. Technological Sustainability

Technological sustainability is related to having existing technology that works, has connectivity and equipment support such as hardware, software, and services (Da Silva and Fernández, 2016). Researchers identified that many ICTD projects including CTCs fail, this is due to a disconnect between ICT design and infrastructure and the reality of the intended end user communities (Kyakulumbye and Pather, 2019; Marjanov, 2019) leading to a “design-actuality gap” (Heeks, 2002, p.108). Heeks (2002) argues that the match or mismatch between the local context and ICT design dictates its success or failure; the wider the gap between the local reality and ICT design, the higher the chances of its failure and the narrower the gap, the high likelihood that it will succeed. This design-actuality gap is specifically relevant in the
Global South, the context of this PhD where most of the ICTD interventions are designed outside the context mostly in the Global North where the social and cultural setting is different, thereby impacting the success of the project (Choi et al., 2016). Bentley (2017) argues that this approach of transporting interventions across contexts fails to acknowledge the existence of different structures and how they influence the people within it. Due to this mismatch between the local reality and technology design, many CTC interventions continue to fail.

2.3.4. Financial sustainability

Financial sustainability pertains to having financial support that ensures continuous functioning, maintenance, and improvement of ICTD, including CTCs (Da Silva and Fernández, 2016b; Sharma and Ray, 2019). Researchers point out that the failure of many ICTD projects, including CTCs, is a result of the lack of maintenance by implementing organisations and funders after the initial investment of providing hardware, software, some administrative support, and connectivity only being funded for a limited period (Gurstein, 2011; Pade-Khene and Lannon, 2017; Marjanov, 2019; Sharma and Ray, 2019). Gurstein (2011) argues that an assumption exists that CTC interventions can magically become social enterprises that can generate revenue from their local communities to cater for access, coverage, pay rent, cover costs for repair and replacement and even pay for staff salaries. For example, in his study on CTCs in a low-income community in Brazil, Nemer (2018a) found that the centres did not generate sufficient income to cover their costs.

To address the sustainability issues discussed in this section, some frameworks to guide design and implementation of ICTD projects are reviewed. This PhD research specifically focused on three frameworks that provide guidelines for a context-specific approach. The table below provides an overview of each framework and identifies the gaps that this PhD aimed to contribute towards.
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<th>Framework</th>
<th>Description</th>
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| Capable and Convivial Design (CCD) (Johri and Pal, 2012) | CCD framework focuses on the design of ICTD interventions and encompasses four components: accessibility easiness, expressive creativity, relational interactivity, and ecological reciprocity.  
  - Accessibility easiness outlines the ICT should be convenient for anyone to use.  
  - Expressive creativity emphasises that ICT should support self-expression and creativity.  
  - Relational interactivity highlights that the ICT should encourage collaborative work.  
  - Ecological reciprocity indicates the ability of the ICT to facilitate a peer-learning environment. | Design of context-relevant ICTs    | The framework provides guidelines on developing context relevant ICTD designs. However, other aspects within the design such as the processes involved in stakeholder engagement are not considered. Additionally, the processes involved in implementation and impact evaluation are not covered in this framework. |
| DEMIR (Definition, Exploration, Modelling, Implementation, Review) framework (Lannon, 2016) | DEMIR framework provides guidelines on developing capacity building ICT projects and encompasses five stages:  
  - Definition involves identifying the project’s overall objectives. | Assessment of capacity building ICT projects | The stages outlined in this framework are very general and does not provide guidelines on how to manage the complexities in the field in relation to |
| RICT-CEF (Rural ICT Comprehensive Evaluation Framework) (Baduza and Khene, 2015) | This framework was first proposed in 2012 (Pade-Khene and Sewry, 2012) and encompasses three aspects of evaluation; overall evaluation plan, evaluation lifecycle and iterative design. The current paper (Baduza and Khene, 2015) provides guidelines on the evaluation lifecycle and highlights three key aspects that are relevant to evaluating ICTD projects as follows; Baseline Study, Needs Assessment, Programme Theory Assessment, Outcome Impact Assessment, Efficiency Assessment and Final Scalability Assessment. | ICTD design, implementation, and evaluation. | ICTD projects evaluation plan | The framework provides guidelines on evaluation lifecycle. However, it does not elaborate on how each aspect is implemented and who is involved in each phase. |
The evidence in this section highlighted gaps in the design, implementation, and evaluation of ICTD projects, including CTCs. Although some frameworks were developed, this review has indicated gaps in the existing frameworks relevant to this PhD. The main shortcoming identified in the existing frameworks was that they provide general guidelines and do not specify the complex processes involved in the design, implementation, and evaluation, specifically the complex power dynamics between different stakeholders to attain sustainability. A reference point to further explore sustainability are the nine principles for digital development which were developed by a group of development organisations and donors. The following section critically assesses them in relation to the four sustainability aspects discussed above.

2.4. Principles for Digital Development: A Critical Assessment

The nine principles for digital development were formulated in 2012 by a group of donor and multilateral organisations, and in 2015 USAID recruited fifty more organisations who signed formal adherence to the principles which are listed below (Adele, 2016; Bon and Akkermans, 2019).

1. Design with the User
2. Understand the Existing Ecosystem
3. Design for Scale
4. Build for Sustainability
5. Be Data-Driven
6. Use Open Standards, Open Data, Open Source and Open Innovation
7. Reuse and Improve
8. Address Privacy and Security
9. Be Collaborative

The first principle, 'Design with the User', outlines identifying user needs through conversation, observation, and co-creation (Adele, 2016). The second principle, 'Understand the Existing Ecosystem', involves understanding the local context, intended users' needs and challenges, existing policies and regulations (HDIF, 2017; Bauer et al., 2018). The third principle, 'Design for Scale', emphasises the importance of evaluation from the beginning of the ICTD project (Adele, 2016). The fourth principle 'Build for Sustainability', stresses the importance of planning for sustainability from the beginning of the ICTD intervention by planning for long-term financial sustainability, utilising and investing in local communities and engaging with local investors accelerate its growth (Adele,
The fifth principle, 'Be Data-Driven', outlines evaluating the ICTD initiative at specific milestones focusing on outcomes instead of outputs. It involves using evaluation outcomes to inform management of the ICTD initiative at all levels and using this data to bridge research gaps (Adele, 2016).

The sixth principle, 'Use Open Standards, Open Data, Open Source and Open Innovation', highlights the importance of having open access systems where data can inform the wider community utilising the ICTD intervention. It also involves allowing other practitioners who may find the ICTD intervention relevant to their work to access the data to inform their interventions (Adele, 2016; Bauer et al., 2018). The seventh principle, 'Reuse and Improve', focuses on designing ICTD initiatives that use, enhance, and extend existing initiatives and learning from past interventions to minimise chances of failures (Adele, 2016). The eighth principle, 'Address Privacy and Security', involves evaluating and mitigating risks to the security of the users of the ICTD initiative by considering the context and needs for individuals' physical safety and privacy to identifiable information (Adele, 2016). Finally, the ninth principle, 'Be Collaborative', highlights the importance of understanding how the ICTD intervention contributes to broader development, engaging with practitioners working in the same area of development and sharing experiences and insights. It also involves recording findings, preparing reports, and sharing best practices widely (Adele, 2016; HDIF, 2017).

Despite these principles' good intentions, a question remains on how they are translated into practice (Bon and Akkermans, 2019). The ICTD practitioner community established that the principles’ high-level statements are not sufficient in ensuring the sustainability of ICTD interventions (Adele, 2016). A critical aspect that has been raised is that the principles within themselves were not designed with the users, i.e., ICTD practitioner community and researchers highlight that the actions of development organisations and donors undermine the statements within the principles such as 'design with user' and 'be collaborative' (Bon and Akkermans, 2019; Roberts, 2020). Furthermore, it is argued that the implementation of ICTD interventions and practicalities in the field are much more complex, and these principles by themselves do not consider the wider multifaceted disparities that may arise due to gender, race, unequal power relationships and disability (Roberts and Hernandez, 2019; Roberts, 2020). Roberts and Hernandez (2019) argue that without explicitly
reflecting on these crucial complex aspects within the low-income communities, the principles contribute to existing inequalities leading to a range of digital technology access and experiences.

The principles have also been critiqued for taking a one size fits all approach, ignoring the complex social, cultural, and political structures within different contexts (Roberts, 2020). Given the highlighted gaps in the principles for digital development, the diverse complexities within a context must be considered for all the four sustainability types discussed above to be achieved.

Although this was not an initial aim of this PhD, a critical review of the ICTD frameworks presented earlier and the principles for digital development informed by the data from this study identified a need to develop a framework that addresses some of these gaps. The next section explores the literature on design approaches to guide the framework development process.

2.5. Design Approaches

The ICTD literature discussed in the previous section highlights that a critical factor towards sustainability of ICTD interventions, including CTCs, is involving the stakeholders throughout the project lifecycle. For this reason, two design approaches that put stakeholders at the core of the design phase were considered in this review: participatory and user-centred designs. In the user-centred design, end-users feedback is sought at different design phases, and the design is adjusted based on users experiences and feedback (Gould et al., 1997; Gulliksen et al., 2003). This shows that users’ needs are put at the forefront of the design process. However, the end-users are treated as subjects who test and evaluate the developed intervention rather than participate in providing input at the initiation phase (Sanders, 2008; Dell’Era and Landoni, 2014).

In contrast, participatory design encompasses a set of theories and principles that emphasise co-creation with end-users throughout the project lifecycle (Muller and Kuhn, 1993; Schuler and Namioka, 1993; Simonsen and Robertson, 2013). This means that in the participatory design, end-users are involved in the initial stages of the design process and are considered as partners who contribute to the decision-making process rather than feedback subjects (Sanders and Stappers, 2008; Dell’Era and Landoni, 2014; Smith, Bossen and Kanstrup, 2017). Participatory design approaches, therefore, provides the end-users with an equal opportunity to contribute towards the design of the intervention, and as a result, the power imbalances between developers and end-users are minimised (Bannon and Ehn, 2013). This approach empowers end-users and provides an
environment for shared learning where trust and mutual respect is nurtured, leading to the development of sustainable context-relevant interventions (Sanders and Stappers, 2008; Simonsen and Robertson, 2013; Bassetti et al., 2019).

However, ongoing discussions about participatory research in the Global South highlight that the design practices are based on a Global North social and cultural understanding, thereby still inherently encouraging neo-colonial practices (Bidwell, 2016; Escobar, 2018; Smith et al., 2020). These gaps in decolonising design are not only present in participatory design but are evident in other spheres such as the approaches used by international organisations implementing ICTD projects, including CTCs, the institutionalisation of aid and the promotion of consumerism culture globally (Smith et al., 2020b). The next section discusses decolonising approaches suggested in the literature.

2.6. Decolonising Approaches

Zavala (2013) argues that decolonising participatory design is about honouring the communities’ perspectives where the intended intervention will be introduced and providing the diverse stakeholders with a space to share their knowledge, experience and to co-create the design with them. Researchers working in the Global South recommend practitioners use postcolonial methodologies derived from the postcolonial theory in design approaches to understand the intercultural differences (Irani et al., 2010; Brereton et al., 2014; Mainsah and Morrison, 2014). This approach also reveals for practitioners knowledge and assumptions about their own cultures (Irani et al., 2010). Winschiers-Theophilus et al (2019) argues that culture is a critical component in the design approach because the designers and communities they are working with come from diverse cultures and have different value systems. Applying the postcolonial methodologies to the ICTD projects' design raises awareness and improves understanding between the cultures working together (Winschiers-Theophilus et al., 2019). For this to occur, the literature on postcolonial participatory design proposes that practitioners create spaces where multiple voices are heard through constructive engagement with the communities (Winschiers-Theophilus et al., 2019; Smith et al., 2020). Winschiers-Theophilus et al (2019) advocates for a "transcultural approach" (p.420) where cultural awareness is at the centre of the design approach and incorporating local values and practices within the processes. Finally, the literature proposes adopting ethical strategies that focus on the communities' social realities (Loi et al., 2018) when designing ICTD interventions with them.
This review informed the creation of the proposed Context Complexities Framework that I developed from building on the data from this study. The framework aims to bridge the shortcomings of the previous frameworks discussed above and some of the gaps in the principles for digital development by providing practical guidelines to implementing a decolonising participatory methodology in low-income contexts in Uganda and similar communities in Sub-Saharan Africa to promote sustainability of CTCs.

2.7. Chapter Summary

Despite the numerous studies on CTCs conducted in the Global South, this chapter has shown the focus has mainly been on the tangible impacts they provide to low-income communities, particularly ICT access. This review has demonstrated a few studies conducted in some African countries have focused on their intangible impacts, also known as soft skills. However, the literature available in this area is still scarce. For this reason, this PhD aimed to inform understanding of how CTCs can support soft skills acquisition in low-income communities in Uganda.

This review also identified persistent inequalities in ICT access, even where CTCs were established, resulting in digital divides known as usage and utility gap. The literature shows that mainly women and girls in the Global South face several barriers that hinder their utilisation of CTCs, which suggests the need for a comprehensive understanding of how women and girls can be supported in these contexts to access CTCs. The findings in this PhD aimed to contribute to this area by presenting detailed insights into understanding how women, girls and children can be supported to utilise CTCs, i.e., the Kiosks in Uganda. Through this data, this PhD intends to shift the discussion from just focusing on equality but instead paying more attention to providing equitable access to CTCs.

The evidence on children's use of ICT, particularly the Internet and associated digital interfaces, shows that ICT poses both opportunities and limitations. However, much of this evidence is limited to the Global North. Nevertheless, data on the limitations that come with ICT adoption still lacks in the Global South. Due to this data gap, a few interventions exist that educate young people on negative online experiences. This PhD intends to generate data on ICT opportunities and limitations, specifically focusing on the CTC environment in the Ugandan context, which aims to inform the development of initiatives that educate children on online safety. This PhD also aimed to offer suggestions that will inform CTC practitioners’ decisions on how they can maximise the
opportunities CTCs bring and minimise limitations through their design and implementation using an appropriate context specific approach.

Given the pervasiveness of the unsustainability of CTCs emphasised in the literature, this review discussed key issues hindering four types of sustainability. It highlighted suggestions identified on how sustainability can be achieved. However, little discussion exists on how this can be accomplished in practice, specifically in CTC spaces. In exploring this further, the chapter examined three ICTD frameworks relevant to this PhD. The main shortcoming identified in all of them is that they provide general guidelines and do not provide practical aspects to how complex issues within the context, such as power dynamics between different stakeholders, can be addressed to achieve sustainability. To further examine sustainability, the review critically assessed the principles for digital development. A shortcoming identified is the complex aspects within the context that this PhD intends to focus on, specifically power imbalance between different stakeholders and the gender and age aspect.

The review focused on the literature on participatory design, specifically focusing on decolonising approaches, which emphasise considering the communities that ICTD practitioners work with as partners in the co-creation of the ICTD intervention, i.e., CTCs and honouring the voices of the diverse stakeholders. This approach aims to inform how complex aspects within the context can be understood. It was not an initial aim of this PhD to develop a framework; however, the data identified a need to create a framework that addresses the gaps identified above. This review informed the development of the proposed Context Complexities Framework which aims to guide CTC practitioners in low-income contexts in Uganda and similar low-income communities in Sub-Saharan Africa to promote sustainability.

This comprehensive literature review informed the guiding ideas, and the gaps in the literature were identified, which led to the development of the research questions for this PhD as follows:

**RQ1:** What contextual factors influence access and utilisation of the Kiosks at the two sites in Uganda?

**RQ2:** What are the perceptions of the impact of the Kiosks on users (young people and adults) at the two sites in Uganda?
**RQ3:** What aspects are crucial in promoting the sustainability of the Kiosks and similar CTC interventions in low-income contexts?

The literature reviewed in this chapter informed the guiding ideas for this research. The next chapter presents the theoretical and methodological approach of this research to illustrate how this PhD aims were achieved. This is to ensure clarity on this PhD's theoretical foundation and a methodology that aligns with the theoretical approach.
Chapter 3: Theoretical and Methodological Approach

In this chapter I establish my theoretical underpinning and provide a detailed description of how these perspectives framed the methodological approach of this study. Section 3.1 discusses the rationale for the approach adopted and discusses the sociocultural perspective which I utilise as a lens to better understand the social and cultural context. I also discuss the justification for incorporating a complementary theoretical lens, the critical postcolonial view as this research evolved to understand power dynamics within the social and cultural context of this research. Thus, I use the sociocultural approach drawing upon ideas from postcolonial approaches to develop a conceptual framework that explicitly links the research questions to the methodological approach adopted.

Section 3.2 presents the multiple case-study design adopted and linked to the sociocultural lens. Subsequent sections 3.3 and 3.4 provide an overview of data generation phases and methods used respectively. This is followed by a detailed account of all data generation phases; pilot study (3.6), preliminary study (3.7), and main study (3.8) and ethical considerations taken. Finally, the chapter closes establishing how credibility and confirmability were enhanced in this research.

3.1. Theoretical Framing

It has been widely acknowledged in the literature that the theoretical stance underpinning research should be made explicit (Hew et al., 2019; Avenier and Thomas, 2015; Blaxter et al., 2010). The theoretical stance encompasses the researcher’s underlying philosophical beliefs about the nature of the social world and understanding of how knowledge is constructed (Twining et al., 2017). The nature of reality can be seen to be on a scale moving from reality being viewed as an objective and quantifiable world driven by natural rules and mechanisms, a positivist position, to a completely subjective entity with multiple realities based on experience, local contexts and dependent on social constructions of the context, an interpretivist position (Guba and Lincoln, 1994; Bryman, 2016).

My assumption about the nature of reality is that “multiple realities that can be studied holistically and, the knower and known are inseparable” (Lincoln and Guba, 1985, p.37). I ascribe to an interpretivist epistemological stance as opposed to the positivist stance which assumes the knower and the known are independent entities (Guba and Lincoln, 1994). Interpretivism makes sense of
data through understanding the participants involved and their social contexts (Bryman, 2016). The research questions for this study were therefore developed through the interpretivist epistemological lens, focusing on how the social and cultural context of participants influenced their perceptions of the Kiosks and interaction with them.

I believe knowledge is constructed as a result of social interaction, interpretation and understanding (Vygotsky, 1962). I draw on the sociocultural perspective to understand how the social and cultural structures informed participants meaning making processes, their perceptions of the Kiosks and interaction with them. In proposing the sociocultural view of context, Lave (1988) emphasises the need to understand the broader cultural system where beliefs about ways of being in the world are created, and how they give meaning to the ways in which people interact. Lave and Wenger (1991) point out the environment in which these beliefs are constructed is integral and inseparable to understanding this social practice.

The sociocultural perspective therefore recognises that individuals are embedded within their context and are influenced by the cultural and social practices of the society they live in (Vygotsky, 1987). It views knowledge construction as a process of enculturation that incorporates tools in social contexts that are valued by the cultural community under study (Brown et al., 1989; Greeno, 1998). Tools are conceived as organising resources that are integrated in the processes that participants make meaning (Lave, 1988). These encompass symbols, tools (Greeno, 1998) and other devices including ICT. Meanings are constructed through “the process by which people interpret situations, events, objects or discourses, in light of their previous knowledge and experience” (Zittoun and Brinkmann, 2012, p.1809). This proposition is crucial to this PhD as it provides a foundation to understanding how the research context influenced the communities’ perception of the Kiosks and determined how they engaged with them.

Furberg (2009) points out that “meaning is dialogically constituted in specific practices and meaning making involves complex interaction between people and the organisation of the setting” (p.9). For instance, to establish how a new ICT intervention fits in the local context where it was introduced, understanding the local community's interaction patterns and the influence of the power dynamics within a context is important (Ansari et al., 2010; Lempiälä et al., 2019). To understand this aspect, this research focused on these sociocultural aspects; first, it draws on learning as a dynamic and
dialogical meaning making process that is deeply rooted in social and cultural context (Lave and Wenger, 1991). In this PhD research, learning refers to how participants engaged with the Kiosks and the meanings assigned to how these facilities served them in achieving their desired goals, i.e., perceived impacts. This lens provided me with an understanding of how sociocultural factors such as gender, identities and power relations influenced users, non-users, and overall communities’ perceptions towards the Kiosks, enabling me to create a link between their understanding, assigned meaning and usage of the Kiosks.

Secondly, it draws on the idea that learning is a social movement where knowledge is co-constructed as individuals learn from others during experience and is situated in a specific context (Lave and Wenger, 1991). This focus enabled me to understand participant narratives of peer learning processes that occurred at the Kiosks. The sociocultural approach also enabled me to understand the gaps in knowledge and processes that contributed to the sustainability issues the Kiosks faced to establish the design-actuality gaps linking it to section 2.3 in the literature. Therefore, the sociocultural approach enabled me to clarify how the Kiosks became a tool that facilitated tasks/activities meaningful to users and the content different user groups, such as in-school users, out-of-school users, teachers, and community users accessed, to establish the impact of the Kiosks.

Based on my reading of the sociocultural literature, I spent time clarifying my understanding of the sociocultural perspective by explicitly linking the research questions and the data needed with the key elements of the sociocultural perspective. However, as this research progressed, I recognised there was need to incorporate an additional theoretical lens that acknowledged power relations as this was not fully conceptualised in the sociocultural perspective. To address all research questions holistically, it was important to acknowledge and examine power relations between Skills to Survive (an international organisation) and Helping Hands (a local organisation). It was also crucial to understand the dynamics between these two organisations and the local communities as well as the linkages between different user groups within the communities. To understand these power dynamics more profoundly, a critical postcolonial lens was adopted. This lens was relevant in critically understanding the influences of an imbalanced power relationship with regards to the issue of sustainability. I argue that it is not possible to critically understand these power dynamics between Global North researchers and practitioners and the low-income communities in Sub-Saharan Africa where ICTD interventions are deployed without considering the history of colonialism. Scholars in
the ICTD field (such as Walsham, 2012; Lin et al., 2015) also point out that the high failure of ICTD interventions is due to a gap in understanding the underlying macro socio-political context that influence the conceptualisation, design, and implementation of the ICTD intervention.

Postcolonialism stresses that there is no positioning outside power and highlights that the power relations between Global North researchers and practitioners and Global South communities and within the communities themselves is deeply contextual, uneven, and complex. Chipidiza and Leidner (2019) point out that the the negative effects of colonialism are still evident in former colonies through power asymmetries. This privilege cannot be minimised or revoked despite rebuking the oppressive hierarchies (Memmi, 1969; Loomba, 1998; Chowdhury, 2006). Discourses on postcolonial theory and postcolonial participatory approaches are diverse and have emerged from several multi-disciplinary perspectives. However, they all emphasise the need to revisit and examine the colonial past and contextualise its effects on formerly colonised regions to deeply understand how colonial ideologies and influences are still embedded in the social and cultural context specifically in relation to power and control. Like the sociocultural perspective, postcolonial participatory approaches emphasise the importance of understanding the social and cultural realities of local contexts. However, postcolonial approaches provide an added lens by contextualising the philosophical, social, and cultural influences that were shaped by colonialism and establishes how these influences interplay with the global power relations, globalisation and interconnected contextual aspects including the socio-economic, cultural, and political facets. Many scholars (such as McLeod, 2013; Strongman, 2014; Lee, 2017 among others) have provided extensive accounts on how postcolonial approaches brings issues of covert oppression that still exist in majority of Global South countries into a sharper focus.

In the context of this research, these ideas from postcolonial participatory approaches provided an understanding to how colonial ideologies and thinking shaped the social, economic, cultural, and institutional systems in Uganda through power structures. Utilising these concepts enabled me to deeply examine the unequal power relations between Skills to Survive, Helping Hands and the communities, organisational interests and ideological influences behind the design and implementation of the Kiosks and interpret how these influenced the decision-making processes. It also provided a narrative to how these factors influenced access and processes at the Kiosks, impact, and sustainability. To demonstrate the interlinkage between different stakeholders i.e., individual
users, the community, and the kiosks, I started by developing an illustrative representation (figure 3.1) showing the interactional link between the Kiosks, individual users, and overall community and linking it to the key elements of the sociocultural framing before the data was generated. However, as the research evolved and the power dynamics between Skills to Survive, Helping Hands and the communities became explicit during the data generation, it became important to expand the theoretical perspective to consider these concepts. This will become clearer in the analysis chapter where I demonstrate how the analysis benefitted from a complementary theoretical perspective specifically utilising post structural concepts to examine power dynamics.

**Figure 3.1: Simplified representation of the data that needed to be generated linked to the key elements of the sociocultural perspective**

![Sociocultural Environment Diagram](image)

The research context is the broader environment within which participants in this PhD research were situated, i.e., urban low-income communities in Uganda as explored in the literature (see sections 1.3 and 1.4). Within this research context lies the sociocultural environment comprising the norms and practices that shaped participants beliefs and behaviour, which determined how the Kiosks were perceived within the local context and the interpretations assigned to them, thereby
determining who accessed them and how they were used. The individual users were situated within the sociocultural environment and had views about the Kiosks' purpose in enabling them to achieve their desired goals (assigned meaning) which determined the content they accessed to accomplish these goals. They also identify the aspects that enabled and hindered their use of the Kiosks. The community also influenced individual users, for example, school, teachers, and parents, on what content to learn, and the individual users influenced the community through sharing the content they learnt. The community (non-users) also had views about the Kiosks, thereby assigning meaning to them. Finally, the Kiosks (A and B) were tools that facilitated access to resources and integrated individual users and the community's meaning-making processes.

This PhD’s research questions addressed the ways in which the different components in figure 3.1 influence and interrelate with each other. RQ1 focused on the contextual factors that influence access and utilisation of the Kiosks for individual users and the community within and across Kiosks. RQ2 identified the perceptions of impact of the Kiosks on users (individual users i.e., young people and adults). RQ3 focused on assessing sustainability aspects within and across Kiosks. To reinforce the methodology, explicit links were made between the components in figure 3.1 and individual data generation methods. This will be presented later in the chapter. But first, I describe the methodology adopted in this PhD.

3.2. Qualitative Methodology

Based on the philosophical position described above, a qualitative methodology was the most appropriate approach for this research. The qualitative approach seeks to understand participants’ perspectives, their roles and activities, their meaning making processes and knowledge construction within the context (Merriam and Tisdell, 2016). As Twining et al (2017) suggest, this meaning is subjective and context dependent. This approach uses the researcher as a research instrument to investigate the complexity of participants’ perceptions of the setting through interaction and a systematic interpretation of the phenomena under study (Denzin and Lincoln, 2005; Creswell and Poth, 2018; Mohajan, 2018; Merriam and Grenier, 2019).

To achieve this, I encouraged a dialogue between myself and the participants through qualitative methods enabling me to understand their perspectives, local social and cultural context, and actual experiences in their natural state. In addition, my prior experience with the context and knowledge
of the local culture and language (see section 1.1) provided me with a foundation for in-depth interpretation of participants’ perspectives. To operationalise this PhD’s conceptual framework in order to address the research questions, a specific research design was required in line with the qualitative methodology. This is discussed below.

3.3. Case-Study Research Design

Given that the research questions for this PhD focused on investigating perceptions, I considered narrative inquiry and phenomenology research designs (Creswell and Poth, 2018) as they aligned with the theoretical approach adopted in this research. Narrative inquiry focuses on understanding individuals’ life experiences and stories (Daiute, 2014). While all qualitative research has a narrative aspect as they seek to understand individuals’ experiences, narrative inquiry focuses explicitly on individual experiences and spends little attention on the context. Phenomenology seeks to understand a specific group's experiences about a context, situation, or event (Creswell, 2018). Although all qualitative research has a phenomenological aspect because they focus on providing a rich narrative of the context and participants involved (Denzin and Lincoln, 2011), this aspect is used in phenomenology as a data generation approach (Padilla-Diaz, 2015). I deemed both approaches unsuitable for this PhD study due to the likelihood of generating very focused data that emphasised the individuals experience without the context and, therefore, would not holistically address the research questions.

The final research design I considered was the case-study research design. It enabled me to understand the similarities and differences within and across the Kiosks through participants diverse perspectives of each Kiosk. The case-study research design facilitated an understanding of the factors that supported and hindered engagement with the Kiosks, their impacts and aspects that influenced the Kiosks' sustainability. Case studies combine several methods to obtain a holistic understanding of the context and participants (Merriam, 1998; Yin, 2018). Yin's (2014) defines the case-study research design as "an empirical inquiry that investigates a contemporary phenomenon (the 'case') in depth and within its real-world context especially when the boundaries between phenomenon and context may not be clearly evident" (p.16). Case-study design has been recommended as an appropriate approach to study social situations as it aids in unfolding the forces that take shape within a context (Creswell and Poth, 2018; Yin, 2018). This proposition fits well with the interpretivist paradigm, sociocultural approach and critical postcolonial view, and the
A crucial aspect of the case study research design is the identification of cases (Creswell and Poth, 2018) and whether the study encompasses single or multiple cases (Stake, 1995; Baxter and Jack, 2008). The decision for the study to entail single or multiple cases is guided by the overall research purpose (Crowe et al., 2011). In this study, the research questions played a crucial role in determining the choices related to the case selection, types of cases and the number of cases. A multiple case study research design was selected to enable analysis within and across cases to understand the participants, Kiosks, and their context. Yin (2018) clarifies that multiple case studies can either be used to establish similar findings within cases or contrasting results between cases. This PhD employed a multiple case study approach to identify both similar and contrasting findings within and across cases. However, it was not a comparative case study of participants, each participant was a case in his/her own right when addressing RQ1 and RQ2. On the other hand, when addressing RQ3, the two Kiosks were compared.

By adopting a multiple case study research design, individuals' diverse perspectives were captured through triangulation of multiple data sources. Stake (2005) defines triangulation as "a process of using multiple perceptions to clarify meaning, verifying the repeatability of an observation or interpretation" (p.454). Patton (2002) outlines that triangulation mitigates the limitation that research findings for a study are an artefact of a single method or single source. The multiple case study employed in this PhD research facilitated using a range of data generation methods which provided me with a rich understanding of the participants and the context.

Another important consideration for the case study design is the clarification of the case boundary that Crowe et al (2011) identify as the social group, organisation or geographical context being
studied; the types of data being generated; and priorities for data generation and analysis. In this study, the research questions determined the case boundaries as follows:

- The first two research questions (RQ1 and 2) sought to understand the Kiosks' participants' experiences. To establish this, I focused on the research questions' elements for example, for RQ1, the factors that supported and hindered access and utilisation of the Kiosks to clarify the boundary that determined the unit of analysis as the users and non-users (young people and adults), the Kiosks, and their setting.

- The third and final research question focused on understanding the Kiosks' sustainability, which defined the unit of analysis as the Kiosks and their setting.

The case-study research design has however been criticised for not being generalisable (Yin, 2018). Nevertheless, critiques often understand generalisation through one type of lens, a statistical-probabilistic generalisability (Smith, 2018). This lens is problematic in all qualitative research as the theoretical underpinning framing qualitative work is that multiple realities exist and knowledge is constructed with researchers rather than discovered in an objective way (Lincoln et al., 2017). Qualitative studies aim to provide a robust account of people’s experiences and perceptions to gain an understanding of a situation or object of study (Hallberg, 2013; Smith, 2018). By using the same standards used in judging quality for quantitative studies, qualitative research sets itself up for failure as this does not align with the authentic nature of qualitative procedures (Kitto et al., 2008). For this reason, qualitative researchers demonstrate transparency by providing detailed descriptions and interpretations of people’s experiences and the object of study (Polit and Beck, 2010) and reflections on their positionality (Bourke, 2014). By providing this rich description, researchers enable the reader to understand the actual state of the context, participants, and the researcher, thereby allowing the reader to make their conclusions. To operationalise the conceptual framework presented in Figure 3.1, explicit links between elements of the framework and the multiple case study design were made in order to generate data that addressed the research questions. This is presented in the table on the next page.
<table>
<thead>
<tr>
<th>Key link with Framework</th>
<th>Who</th>
<th>Data to be generated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual users</td>
<td>Young people</td>
<td>Focus group discussions (up to 60 minutes)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Individual interviews with young people (up to 45 minutes)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Individual interviews with young people’s parents/parents/carers (up to 45 minutes)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Individual interviews with young people’s teachers (up to 60 minutes)</td>
</tr>
<tr>
<td>Adults (community users and teachers)</td>
<td></td>
<td>Individual interviews with teacher users (up to 60 minutes)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Individual interviews with community users (up to 60 minutes)</td>
</tr>
<tr>
<td>Community</td>
<td>Kiosks’ gatekeepers (local community)</td>
<td>Individual interviews with caretakers of the Kiosks from the local community (up to 60 minutes)</td>
</tr>
<tr>
<td></td>
<td>Non-users</td>
<td>Individual interviews with young people who were non-users (up to 30 minutes)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Individual interviews with adults who were non-users (up to 30 minutes)</td>
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<tr>
<td></td>
<td></td>
<td>Field notes collected from interaction with adult community members who lived or worked near the Kiosks but were non-users</td>
</tr>
<tr>
<td>Kiosks (tool)</td>
<td>Kiosks’ gatekeepers (organisations), their website and published report</td>
<td>Document Analysis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Individual interview with Skills to Survive (UK) representative (up to 60 minutes)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Document Analysis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Individual interview with Helping Hands representative (Uganda) (up to 60 minutes)</td>
</tr>
<tr>
<td></td>
<td>Kiosk A and B</td>
<td>Focus group discussions with key stakeholders of each Kiosk (up to 60 minutes)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Individual interviews with community members who were involved with the development of the Kiosks (up to 60 minutes)</td>
</tr>
</tbody>
</table>
The key link with the framework column outlines the data that needed to be generated, as shown in figure 3.1. The Who column refers to the individuals who were involved in the research. Finally, the data to be generated column refers to how the data was generated.

Inevitably variations in the data generation across Kiosks existed in practice due to the reality in the field. For example, the locations of the Kiosks determined access to the participants. Due to this, more participants were accessible at Kiosk A as it was in a school compared to Kiosk B which was by the market. These aspects of the reality in the field in relation to data generation are further discussed in later sections (see sections 3.7 and 3.8). The next section presents an outline of the data generation phases and participants that were involved in this PhD research.

3.4. Overview of Data Generation Phases and Research Participants

This study evolved through three data generation phases:

- A pilot study (see section 3.6) that aimed to test and refine the research methods and data collection instruments.
- A preliminary study (see section 3.7) that aimed to establish the research sites, identify potential participants, test the research methods, and commenced the data generation.
- A main study (see section 3.8) that addressed the research questions.

Figure 3.2 below provides an outline of the data generation phases, purposes and research participants for each phase. The content in this figure and the chronological steps in each data generation phase will be discussed in detail in later sections (see sections 3.5, 3.6 and 3.7).

**Figure 3.2: Data Generation Phases**
3.5. Methods

In order to generate data that addresses the research questions, different methods were considered. The subsections below provide a detailed account of the data generation methods: document analysis (3.5.1), focus groups (3.5.2), interviews (3.5.3), and field notes (3.5.4). The subsequent data generation phases will discuss in detail how these methods were employed in each stage.

3.5.1. Document Analysis

Document analysis was used to establish a foundation to understand the context of research by providing background information about how the Kiosks were designed, who used them and how they were used. Merriam (1988) suggests that “documents of all types can help the researcher uncover meaning, develop understanding, and discover insights relevant to the research problem” (p.118). In this research the analysed documents comprised of the information on Skills to Survive website (pseudonym) and a published analysis report. The table below outlines the documents and their purpose within this PhD.

Table 3.2: Outline of Document Analysis

<table>
<thead>
<tr>
<th>Analysed Document</th>
<th>Purpose of the Document within the study</th>
</tr>
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</table>
| Skills to Survive website information. | • The information on the website provided an overview of the objectives of the project i.e., Kiosks and how they worked. This provided me with initial background information on the research context.  
• This information also provided initial background information on the processes that were involved in the initiation and implementation of the Kiosks. This prompted questions to be asked on how the local partner organisation and local communities were involved in this process. This information fed into addressing RQ3 |
| An analysis report by Skills to Survive published in 2017 of the kiosks’ use after one-year deployment. | • Provided information on the location of the Kiosks and who used them. This prompted questions that needed to be asked in relation to the impacts of the Kiosks which fed into RQ2. |
3.5.2. Focus Groups

The interaction between focus group participants provides an understanding of the phenomenon under investigation and reveals where consensus and contradiction exist (Traynor, 2015). The phenomenon under investigation in this PhD research were the Kiosks and their context. Focus groups were used as a scoping tool to identify potential participants for the main study and to generate initial data for the research questions. The focus groups were also used to identify participants who were willing to take part in individual follow-up interviews to understand their’ perspectives and the context in depth. The focus groups revealed meaning making in a social dialogue in which both individual and shared perspectives were constructed (Lunt and Livingstone, 1996; Freeman, 2013).

Establishing this link between participants’ perceptions and their social and cultural context was in alignment with the sociocultural perspective. It demonstrated how the context influenced individuals’ beliefs and experience of the world. The focus groups also established how participants made sense of the Kiosks and highlighted how they made their interpretations visible to other participants and me during the discussions, enabling me to understand the meanings associated with the Kiosks and how they were used.

Initial testing of the focus group method was conducted during the pilot study, although the data generated in the pilot was not analysed (see section 3.6). A total of thirteen focus group discussions were conducted during the preliminary and main studies. I followed Kamberelis and Dimitriadis’ (2013) recommendation to create comprehensive focus group guides with clear guidelines on the organisation of focus groups and areas to be covered. Three focus group guides were developed; one for the pilot study focus groups with young people, one to guide the preliminary study focus groups with young people, and one to guide the focus groups conducted during the main study (see Appendix I for pilot study guide, Appendix III for preliminary study guide and Appendix IV for main study). The areas that were covered in the guides were as follows:

- Revealed huge gender disparities existed in their use. This prompted questions that needed to be asked in relation to enablers and barriers to accessing and utilising the Kiosks. This information fed into RQ1.
• General questions to understand participants’ perceptions and experiences of using or not using the Kiosks.
• Positive impacts of the Kiosks/ negative impacts and how they tackled them.
• Similarities and differences of the Kiosks.
• Information about factors at each Kiosk that enabled or hindered their use.

The data generated from the focus groups addressed all the three research questions for this study and was combined with the data from other methods. A detailed explanation of how focus groups were employed at each phase of data generation is presented in sections 3.6, 3.7 and 3.8.

3.5.3. Interviews

Interviews established a more detailed and nuanced description of the social situation and participant experiences by further exploring the concepts that emerged from the focus groups. Interviews generate data in the participants' words and expressions in a one-to-one directed conversation, which allows for an interpretation of what is being studied while addressing the research questions (Powney, 1987; Bogdan and Bilken, 2007; Yin, 2013). In this PhD research, the interpretation involved the individual experiences of utilising the Kiosks and their impact and understanding the issues that affected the Kiosks' sustainability from the individual participants. I applied Rubin and Rubin's (1995) topical interviewing technique to guide the interviews, which comprised of what, when, how, and why questions. The questions were semi-structured with guiding topics related to the Kiosks and their contextual environment. This approach facilitated a dialogue between the participants and me and provided an opportunity for follow-up questions based on their responses.

The main group of interviewees were frequent users of the Kiosks who comprised of young people and adults. However, to efficiently address all research questions, it was crucial to interview the Kiosks' gatekeepers' representatives, consisting of representatives from Skills to Survive, Helping Hands and the local communities. It also involved interviewing young people's parents and teachers, and non-users. I developed interview guides for the different groups of participants, which I loosely followed to structure the conversations with participants (see Appendix VI and VII). Prompts from the focus groups guided the interviews with young people who were users of the Kiosks. The interviews with their parents/carers and teachers were steered by the topics that emerged from young people interviews. The interview guides and questions served as checkpoints (McCracken, 1988) within the flow of a natural conversation (Arsel, 2017), thereby allowing me to understand
participants experiences of using the Kiosks. A detailed description of how interviews were employed at each phase of data generation is presented in sections 3.7 and 3.8.

3.5.4. Field Notes
Taking field notes to document important contextual information fitted well with the theoretical interpretivist design framing this study and my reflexivity. Following Creswell and Poth’s (2018) recommendation on the importance of field notes in providing a rich context for analysis, I wrote about the study’s context entailing structural and organisational features within and surrounding the Kiosks and Hillside school (pseudonym) during fieldwork. The field notes also covered information on the geographic setting, overall demographics of the communities where both Kiosks were located and surrounding areas and, the social and cultural practices. This approach enabled me to reflect on the events that were happening at the Kiosks and their surroundings, participants’ perspectives, their social relationships, and meanings attached to the Kiosks in relation to the social and cultural context. The field notes provided additional information to create a more detailed description of the participants and the context (see Appendix VIII for field notes examples).

3.6. Pilot-Study
As outlined in section 3.3, a decision to conduct a pilot study was made to test data collection instruments and refine data generation methods. The initial plan for the main study was to conduct observations of young people working around the computers at the Kiosks. Therefore, the focus of the pilot study was to establish how to best capture video data of young people and to enhance my skills in conducting focus groups. To minimise the anticipated risk of mugging/theft at the research sites in Uganda, the use of a simple recording instruments was considered; a concealed pen camera for recording video data and a USB flash drive audio-recorder to audio-record focus group and interview data (see figure 3.3 and 3.4 in Appendix I). All appropriate permissions for video and audio recording were accounted for in the ethical considerations (see subsection 3.7.2).

To access a pilot study site, I introduced my research to members of the Centre for Research in Education and Educational Technology (CREET) at The Open University via an email and requested to be introduced to school contacts in England that may be interested in taking part in the pilot study. After some successful email introductions to schools, I contacted various schools and received the interest to participate in the pilot study from two schools. Purposive sampling based on the
availability and willingness of young people to participate in the study was utilised, a recommended technique to recruit participants to generate relevant information (Morgan, 1988; Palinkas et al., 2015).

I conducted one overall pilot study with two primary schools in England in July 2017. In each school, two groups of four Year 6 students sat around an internet-connected laptop and were given 45 minutes to solve a complex problem related to their school subjects collaboratively. Thereafter, students were asked to present their findings to their peers. I used laptops in place of the Kiosks; however, these were not the same but still offered the opportunity to test out the video capture (see Appendix I for observation guide).

Subsequent to this, one focus group discussion entailing the eight students from both groups was conducted for 60 minutes. Conducting these focus group discussions provided me with an opportunity to test my skills in mediating focus groups. The focus groups were audio-recorded using a USB flash drive audio-recorder (see figure 3.4). The emphasis was to ensure it was an appropriate device to use for fieldwork in Uganda to minimise notetaking while conducting focus groups and interviews. This was a more reliable method of data storage as I could concentrate on listening to participants without the interruption of trying to take notes. This USB flash drive audio-recorder became a suitable data collection instrument for fieldwork in Uganda.

The experience of conducting the focus groups enabled me to reflect on refining my mediating skills through using the moderator technique, a method used to direct the flow of the focus groups (Tausch and Menold, 2016). A limitation faced during the focus group discussions was a dominant person overriding other participants in both schools. To mitigate this limitation, I planned to:

- Conduct the focus groups in smaller homogenous groups considering the gender and age groups in line with Uganda's local cultural context.
- Engage shy participants through prompting for further information.
- Deal with dominant participants by acknowledging their opinions and seeking views from others.
- Summarise extended unclear explanations by participants to ensure both myself and the other group members understood their point.
Another limitation faced during the pilot study is that the concealed camera became unreliable, and difficulties in capturing both what was happening on the screen and between users were experienced. Therefore, I concluded that this instrument was not suitable for data collection. The pilot study also highlighted that two cameras would be necessary for each observation during the main study; one to capture the computer screen and the other to capture participants’ interaction around a computer. These methodological findings informed the preliminary study which is discussed in the next section.

3.7. Preliminary Study

This section discusses the preliminary study describing its aims, participants, methods used and outcomes of the study. The objectives of the preliminary study were:

I. To get an overview of the two research sites, establish positive links with the communities involved and gain informed consent from the key gatekeepers.

II. To identify potential participants, get informed consent from participants and their parents where appropriate and conduct preliminary focus groups with participants.

III. To further refine the methods and instruments of data generation for the main study, for example, the technicalities of conducting focus groups and interviews and how to best set up the observation cameras at each Kiosk.

IV. To commence data generation about the context which was critical to the sociocultural framing adopted.

As outlined earlier (see section 1.8), I introduced my research proposal to Skills to Survive and sought their permission to access the research sites. This was done through an initial email contact that led to an initial call where I verbally explained my research and gathered initial preliminary data on how the project was initiated and the partnership with Helping Hands was formed. Skills to Survive then introduced me to Helping Hands who supported me in accessing the research sites. To gain access to potential participants of the study, I followed further protocols in building rapport with the communities involved. This is described in the next section.

3.7.1. Establishing positive links with the local communities

To establish credibility and trust between myself and the communities involved, I adopted measures that suited the context's reality. I immersed myself in the communities where the Kiosks were
located by accepting the invitations and offers extended to me to build trust and rapport with the local communities and to better understand their real-life experiences. This involved accepting invitations for tea in some young people’s homes when I conducted interviews with their parents. The parents preferred the interviews to be conducted on the veranda in front of their homes or local businesses, either we (the participant and I) would sit on a mat on the floor or the participant brought chairs. In one instance I was offered a bunch of ‘matooke’ (green plantain) the local staple food and jackfruit since the parent learnt I liked them. In addition, sometimes while walking through villages within the peri-urban environment with Ms Jane (one of the local community Kiosk gatekeeper who assisted in directing me to the venue of interviews with the study participant parents), we would meet with people harvesting jackfruits and were offered a slice of jackfruit each.

I was also invited to accompany a senior staff member of Hillside school and a group of women campaigning for her to become the woman representative for their constituency. I only accompanied them because I saw this as an opportunity to build rapport and integrate with the local community. I did not actively participate in the campaigns and only walked alongside the teachers who accompanied her. All the above opportunities were extended contact that provided me with an opportunity to nurture trust and credibility between myself and the communities involved in the research as well as a further glimpse to understanding their real-life experiences.

I accepted every invitation that was offered to me so that I could ensure my research mirrored the communities’ real-life experiences. In addition, my understanding of the context and knowledge of the local language and culture placed me in a more accessible position to easily gain trust and credibility from the potential participants and parents (for young people under 18 years) to consent to take part in the study. Before the participants involved in this study were contacted, ethical clearance was obtained at the organisational and community level, and a procedure was followed to recruit participants. These are discussed in the next section.

3.7.2. Ethical Considerations and Participant Recruitment
Addressing what Guillemin and Gillam (2004) and Kubanyiova (2008) refer to as “macroethics” (Kubanyiova, 2008, p.505) involved obtaining ethical approval from both the organisation that set up the Kiosks i.e. Skills to Survive (pseudonym) (see Appendix II) and The Open University’s Human Research Ethics Committee for each of the three studies, i.e. pilot, preliminary and the main
studies. The “microethics” (Guillemin and Gillam, 2004, p.265) involved my prior experience and understanding of the context, which enabled me to approach the field with flexibility and sensitivity. This proposition is in line with my theoretical approach and methodology which emphasises the importance of understanding the social and cultural context of the research participants. It also aligns with Hammersley and Atkinson (2019) who argue that realities in the Global South involves considering multidimensional factors beyond obtaining signatures on forms. Below is a detailed description of the ethical considerations that were adopted to suit the research context.

As a representative of the Open University (UK), I adhered to the university’s mandatory ethical procedures and prepared detailed documents (printed on Open University letterhead) that explained the project in-depth to potential participants and sought to obtain informed signed consent. Taking into account the social and cultural context was paramount to this study, in doing so, I adopted a flexible approach when seeking consent that suited the practicalities of the field. Shapiro and Meslin (2001) argue that the preliminary decision making for informed consent in the Global South is often vested in the community leaders rather than the individual. This was also evident from my prior experience working in contexts similar to the research location. It was therefore essential for me to obtain permission from gatekeepers, including Skills to Survive, Helping Hands, community leaders and Hillside school management before approaching the participants.

A key objective of the preliminary study was to establish rapport with the gatekeepers and trust with the communities involved in this research. I had initial meetings with the gatekeepers at the beginning of the preliminary study where I explained the project, its research design, and objectives. The participants for this study were selected using two ways of purposeful sampling; the first approach was through the gatekeepers who helped to identify the initial potential participants who were users of the Kiosks and introduced me to them. I then approached them and their parents (for young people) to participate in the study. The second approach was through the initial potential participants who identified other users and non-users of the Kiosks who were approached to take part in the study. Applying purposeful sampling as an approach to recruit research participants enabled me to generate relevant rich data that addressed the research questions. Additionally, as indicated above, given the dynamics of the communities, and setting of the context, it was impossible to access the potential participants directly. However, a possible bias to this method was
the likelihood of obtaining active users of the Kiosks who experienced positive impacts. To mitigate this limitation, I ensured to include non-users of both Kiosks in the study.

During the recruitment, I explained the research objectives, design and methods involved to potential participants in both English and Luganda for those who were illiterate. I then sought written informed signed consent for those who could read and understand the form and verbal consent for those who could not read the forms due to illiteracy. I clarified to potential participants that their involvement in this research was voluntary, and they had the right to withdraw from the study at any point before transcripts were anonymised. I provided them with my Open University email and local mobile number to request this if they wished to withdraw from the study. I clarified all the above in my ethics clearance form and was granted permission by the Human Research Ethics Committee at the Open University to conduct this research (HREC/2018/2747/Mohamud).

Following Creswell and Poth’s (2018) recommendation that prolonged engagement helps to establish rapport, I spent the first two weeks of the preliminary study establishing trust and credibility with the communities that were involved in this research as demonstrated in the previous section. Throughout the fieldwork of this research, I immersed and assimilated with the local culture by communicating in the local language (Luganda), dressed like a local, walked through the localities with people who belonged to those communities and used the local motorbike transportation ‘boda-boda’ where necessary. Concealing the identity of the organisations and all participants who took part in this PhD research was important in ensuring their privacy was protected and were not exposed to any discomfort within their communities. All names used in this thesis are pseudonyms.

Additionally, some safeguarding concerns were identified during the study where young people indicated being beaten by adults at the Kiosks and girls noted being harassed by male users of the Kiosks. Furthermore, there was the risk of users of the Kiosks being electrocuted due to the exposed wires. I reported the abuse issues to the committee overseeing Kiosk A and Hillside school management for Kiosk A and Helping Hands for Kiosk B as there was no committee overseeing this Kiosk. I also reported the issue of exposed wires and risk of being electrocuted to Helping Hands and Skills to Survive. However, I found that the authorities I reported to were already aware of the
abuse issues and noted they were working towards addressing them. The next section discusses how data for the preliminary study was generated.

3.7.3. Preliminary Study Data Generation

The data generation for the preliminary study took place within five weeks (including trust building with the community which took place in the first two weeks) in January and February 2018 and was guided by the multiple case study data generation model presented earlier (see table 3.1). The data generation methods entailed focus groups with young people and preliminary interviews with Kiosks’ gatekeepers comprising of organisation gatekeepers i.e., Helping Hands and Skills to Survive and local community Kiosks caretakers (committee). In addition, the initial introductory call with Skills to Survive Founder generated some preliminary data on how the project was initiated. The data generated from the preliminary study aimed to address this PhD’s initial research questions which were further refined in light of the findings from this field visit. These initial research questions were:

RQ1a: What impact, if any have the Kiosks at two sites in Uganda, had on school-going users lives so far?

RQ2a: To what extent are the Kiosks at the two sites in Uganda complementing formal education?

RQ3a: How does gender impact on the findings for questions one and two (if at all)?

As described above (see subsection 3.5.3) topical interviewing technique was applied when generating data. To address the initial research questions, both the focus groups and interviews were guided by a set of questions that helped steer the discussions. The following questions guided the focus groups with young people:

- Tell me about your experience using the Kiosks.
- How long have you been using it for?
- What purpose/s do you use it for?
- Does the Kiosk complement or distract your formal education?
- As a male/female do you get adequate opportunity to use the Kiosk(pseudonym)?
- What led to the Kiosks getting spoilt? (Added during fieldwork as I found out upon my arrival that the computers at the Kiosks were non-functional).
The focus group discussions were conducted in a quiet location familiar to participants; a classroom or the church at Hillside school for Kiosk A users and a nearby church for Kiosk B users and lasted between 45 and 60 minutes. The preliminary interviews occurred at a convenient location for gatekeepers, Helping Hands Office (pseudonym) for the representative from Helping Hands and an office at Hillside school for gatekeepers at Kiosk A. The interview with Skills to Survive Founder was conducted after the preliminary study. All focus groups and interviews were audio recorded and permission to do so was sought (see subsection 3.7.2). The preliminary interviews were guided by the interview questions presented below. The representative from Skills to Survive was asked the first set of questions, Helping Hands representative the next set, and finally, Kiosk A committee members were asked the last set of questions. The responses to these questions provided background information about the Kiosks and the processes that were involved in their design and implementation.

**Skills to Survive**

- Tell me about your journey as Skills to Survive in relation to the Kiosks (pseudonym).
- How did you partner with the local partner, Helping Hands (pseudonym)?
- How did you engage with the local communities?
- What was done to understand the context before the Kiosks were built?
- What are the triumphs and challenges faced in this project?
- What have you learnt from this experience?
- Do you have any other partnerships besides Helping Hands?

**Helping Hands**

- How was the partnership between Skills to Survive (pseudonym) and Helping Hands (pseudonym) established?
- How did you engage with the local communities?
- What are the triumphs and challenges faced in this project?
- Tell me about your journey as Helping Hands (pseudonym) in relation to the Kiosks (pseudonym).
• What are the issues causing the breakdowns of the Kiosks? (Added during fieldwork as a result from findings of observations within the field and data from focus groups with young people).
• How was the local community involved in the initial planning of the Kiosks?
• How was the process of building the Kiosks established?

Kiosks committee representatives
• When was the committee formed and who does it contain?
• What role does the committee play?
• How often do you meet?
• As a committee member, what are the good and bad experiences you have had?

The table presented below provides an outline of the data generation activities that were undertaken during this phase, participants involved, and initial research questions addressed (labelled as RQ1a, 2a and 3a).

Table 3.3: Preliminary Study Data Generation Overview

<table>
<thead>
<tr>
<th>Kiosk</th>
<th>Fieldwork Activities</th>
<th>Participants Involved</th>
<th>Initial Research Question(s) Addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kiosk A</td>
<td>Two single sex focus groups with fourteen participants in total, each lasting up to 45 to 60 mins</td>
<td>7 boy users- FGD1 7 girl users- FGD2</td>
<td>RQ1a and 2a</td>
</tr>
<tr>
<td>Kiosk A</td>
<td>Preliminary interviews with Kiosk committee members and teachers, each lasting 30 to 50 mins</td>
<td>1 male community user and committee member 2 female teachers and committee members</td>
<td>RQ1a, 2a and 3a RQ1a, 2a and 3a</td>
</tr>
<tr>
<td>Kiosk A and B</td>
<td>Interview with Helping Hands representative which lasted for 60 mins (The same person provided information for both Kiosks)</td>
<td>1 male representative</td>
<td>RQ1a, 2a and 3a</td>
</tr>
<tr>
<td>Kiosk B</td>
<td>Two single sex focus groups with ten participants in total, lasting 45 to 60 mins</td>
<td>5 boy users- FGD1 5 girl users- FGD2</td>
<td>RQ1a and RQ2a</td>
</tr>
</tbody>
</table>
As outlined earlier in this PhD’s case-study model (see text after table 3.1), there were variations in the data generation due to the realities in the field. Although I aimed to recruit the same number of participants at each Kiosk, it became clear to me that the location of the Kiosks played a key role in determining access to potential participants. For this reason, more potential participants could be identified at Kiosk A as it was in a school compared to Kiosk B which was by the market.

The other factor that determined access to potential participants was the functionality of the Kiosks. Upon my arrival, I found that both the WiFi and computers at Kiosk B were non-functional, and due to its location (a market area) and the absence of organisational structure to assist with identifying potential participants, it was more challenging to identify sufficient potential participants.

### 3.7.4. The modification of research questions following the preliminary study

The findings from this preliminary study indicated that the Kiosks were used by other community members beyond school-going children. I learnt that young people who were out of school (some attended school sometimes), teachers at Hillside school and adult community members utilised them. This led to the change of the initial RQ1 in alignment with these findings to reflect all user groups who utilised the Kiosks. The focus therefore shifted from assessing only the impact on school-going users to a broad understanding of the impact on all user groups who utilised the Kiosks including teachers, out-of-school children, and adult community users. Thus, the initial RQ2 focusing on how the Kiosks complemented formal education was combined with RQ1. Therefore, this first research question changed to:

> What are the perceptions of impact of the Kiosks on users (young people and adults) at the two sites in Uganda?

Additionally, the focus groups with young people revealed some contextual barriers that hindered their access and utilisation of the Kiosks. It became important to understand these aspects from their perspective in order to identify the sociocultural practices that must be considered to encourage ICT
access and utilisation among low-income communities. This led to development of another research question which encompassed the numerous aspects that influence access and utilisation including gender. Thus, the initial RQ3 looking at gender aspects was replaced with:

What contextual factors influence access and utilisation of the Kiosks at the two sites in Uganda?

Finally, although the WiFi at Kiosk A was working, the computers at both Kiosks were non-functional. It was therefore impossible to conduct observation of the Kiosks being used as planned in the pilot study. This experience of finding non-functional computers at the Kiosks led to the development of an additional research question focusing on the sustainability of the Kiosks as follows:

What aspects are crucial in promoting the sustainability of the Kiosks and similar CTC interventions in low-income contexts?

The focus of this research also changed from observing how the Kiosks impacted on users to exploring their perceptions and generating self-reports through focus groups and interviews on the impact of the Kiosks on them. Field notes were also taken to document background information including geographic settings, overall demographics of the communities where both Kiosks were located, their social and cultural practices and surrounding areas.

3.8. Main Study

The data generation for the main study began as soon as I entered the field on the second visit as I had established trust and credibility with the communities involved and laid the foundation for this research during the preliminary study (see subsection 3.7.1). The data generation took place over two months between May and July 2018 and was guided by this PhD’s multiple case-study data generation model (see table 3.1). The methods involved document analysis, focus groups and interviews with participants and recording of field notes. Focus groups and interviews with young people at Kiosk A took place in a classroom or the church at Hillside school and a nearby church for young people at Kiosk B lasting for about 45 minutes. The same questions that were asked during focus groups in the preliminary study were used for the focus groups in the main study to ensure the data was matched with previous focus group data. This data was still relevant to the research despite the refinement of research questions.
To address the new research questions, all interviews were guided by a set of topical questions. The interviews with young people’s parents and teachers were conducted where they felt comfortable for the parents (either at their homes or local businesses) and teachers (in their respective schools) lasting between 30 to 60 minutes. Finally, the stakeholder focus group exploring the crucial aspects that were important in promoting the sustainability of Kiosk A was conducted in a classroom at Hillside School and lasted for 90 minutes. Due to the challenges that faced Kiosk B, it was impossible to conduct a similar stakeholder focus group as there were no stakeholders such as a committee overseeing the Kiosk like in Kiosk A.

The refined research questions above guided the discussions in this phase of data generation. The table below provides an overview of the data generation activities undertaken during the main study, participants involved, and the new research questions addressed as follows: (labelled as RQ1, 2 and 3 in the table to differentiate from initial research questions).

RQ1: What contextual factors influence access and utilisation of the Kiosks at the two sites in Uganda?

RQ2: What are the perceptions of the impact of the Kiosks on users (young people and adults) at the two sites in Uganda?

RQ3: What aspects are crucial in promoting the sustainability of the Kiosks and similar CTC interventions in low-income contexts?

### Table 3.4: Main Study Data Generation Overview

<table>
<thead>
<tr>
<th>Kiosk</th>
<th>Fieldwork Activities</th>
<th>Participants Involved</th>
<th>New Research Question(s) Addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kiosk A</td>
<td>Two single-sex focus groups with five participants in total, lasting 45 mins</td>
<td>3 boy users- FG1 2 girl users- FG2</td>
<td>RQ1, 2 and 3</td>
</tr>
<tr>
<td>Kiosk A</td>
<td>Individual interviews with Kiosk school–aged users of the Kiosks (both in-school and out of school) who were frequent users, lasting 30-45 mins</td>
<td>12 boys (9 enrolled in school and 3 out of school)</td>
<td>RQ1, 2 and 3</td>
</tr>
<tr>
<td>Kiosk A</td>
<td>Individual interviews with young people’s teachers, lasting 30-60 mins</td>
<td>10 girls (8 enrolled in school and 2 out of school)</td>
<td>RQ1, 2 and 3</td>
</tr>
<tr>
<td>Kiosk A</td>
<td>Individual interviews with young people’s parents, lasting 30-45 mins</td>
<td>7 teachers (4 of them were users of the Kiosk A)</td>
<td>RQ1, 2 and 3</td>
</tr>
<tr>
<td>Kiosk A</td>
<td>Individual interviews with community users, lasting 30-60 mins</td>
<td>13 parents</td>
<td>RQ1, 2 and 3</td>
</tr>
<tr>
<td>Kiosk A</td>
<td>Individual interviews with non-users, lasting 15-20 mins</td>
<td>4 community users</td>
<td>RQ1, 2 and 3</td>
</tr>
<tr>
<td>Kiosk A</td>
<td>Focus group with stakeholders, Helping Hands representative, committee representatives, teachers, and students, lasting for approximately 90 mins</td>
<td>2 boys</td>
<td>RQ1 and 3</td>
</tr>
<tr>
<td>Kiosk A</td>
<td>Interviews with adult non-users who played a role in the implementation/maintenance of the Kiosk</td>
<td>2 girls</td>
<td>RQ1 and 3</td>
</tr>
<tr>
<td>Kiosk B</td>
<td>One single-sex focus groups with five participants in total 30-45 mins</td>
<td>10 participants</td>
<td>RQ1 and 3</td>
</tr>
<tr>
<td>Kiosk B</td>
<td>Five individual interviews with active school-aged users (both in school &amp; out of school)</td>
<td>5 boy users- FG1</td>
<td>RQ1, 2 and 3</td>
</tr>
<tr>
<td>Kiosk B</td>
<td>Individual interview with community user</td>
<td>4 boys (3 enrolled in school and 1 out of school)</td>
<td>RQ1, 2 and 3</td>
</tr>
<tr>
<td>Kiosk B</td>
<td>Individual interviews with non-users, lasting 15-20 mins</td>
<td>1 girl (enrolled in school)</td>
<td></td>
</tr>
</tbody>
</table>

Differences in the number of participants who took part in this study from each Kiosk existed due to the inaccessibility of participants who used Kiosk B as explained in the previous section.

### 3.9. Credibility and Confirmability

Lincoln and Guba (1985) emphasise that credibility is one of the most important aspects of establishing trustworthiness in a study. A credible study is one that shows a detailed description of how the data was collected, analysed and interpreted (Yin, 2016). The literature suggests several
strategies to enhance credibility. Lincoln and Guba (1985) and Erlandson et al (1993) recommend extended engagement between the researcher and participants. In this research, extended engagement was achieved through the preliminary study where I built trust and rapport with the local communities involved in this study prior to the main data generation. In this research, adopting a multiple case-study approach, triangulation of different data sources, extending the analysis across all the cases and providing a detailed account of the steps involved in the research process were employed to enhance credibility and transparency.

3.10. Summary

To understand the research context and participants holistically, it was important for me to adopt an approach that aligned with my interpretivist paradigm. I considered the sociocultural perspective which enabled me to understand how sociocultural factors such as gender, identities and power relations influenced users, non-users, and overall community perceptions towards the Kiosks. This enabled me to create a link between their understanding and assigned meaning of the Kiosks and their usage in order to establish impact. To integrate the sociocultural lens in this research, a conceptual framework that links the research questions to the sociocultural perspective was developed to inform the data generation. This conceptual framework was incorporated in the qualitative multiple case-study research design adopted in this research. To strengthen the methodology, explicit links between the components of the framework and individual data generation methods were made in order to address the research questions. However, as this research progressed, there was a need to incorporate an additional theoretical lens to examine power relations between the different stakeholders within this study since this aspect was not fully conceptualised in the sociocultural perspective. Thus, these power dynamics were examined through the understandings from postcolonial approaches.

This research evolved through three data generation phases: pilot; preliminary; and main studies. A pilot study in two schools in England that tested and refined the research methods and data collection instruments. A preliminary study at the research sites in Uganda that enabled me to establish positive links with local communities and facilitated the recruitment of potential participants. This research adopted an ethical approach that was sensitive and practical to the realities on the ground and consent to participate in the study was sought during this preliminary visit. This preliminary study also enabled me to test the research methods and commence the data generation which informed the
refinement of research questions in light of the findings from the field. Finally, a main study that addressed the refined research questions was conducted. To establish how the data generated in this research was interpreted, the next chapter provides a detailed explanation of how empirical data were analysed.
Chapter 4: Data Analysis

This chapter provides a comprehensive description of how this study's data were analysed following Braun and Clarke's (2006) thematic analysis approach. Section 4.1 describes the processes that were involved in the transcription and translation of the data. Section 4.2 reports on the processes involved in the data mapping and interpretation, and 4.3 provides an account of how the proposed Context Complexities framework was developed, a framework that aims to facilitate negotiations between the different stakeholders to create a shared understanding in line with the context's reality.

4.1. Data Processing

The preliminary (see table 3.3) and main (see table 3.4) studies of this research generated 68 audio-recorded interviews, eight audio-recorded focus groups, and two exercise books of field notes. This section describes the procedure applied in translating the interview audio recordings conducted in Luganda into English where required and transcribing all the focus groups and interview data. It also explains the approach I took to familiarise myself with the transcripts and all data sources.

Transcribing has been described as the most tedious aspect of qualitative research (Loubere, 2017). On the contrary, I found translating and transcribing a useful initial stage of immersing myself in the data, which aligned with the sociocultural lens adopted in this research by enabling me to understand further the context and social and cultural influences of participants. I chose to transcribe the audio recordings myself rather than using a transcription service. As suggested by Stuckey (2014), this was an early stage of analysis. By listening to the audio files and converting them into a written format, I examined participants' responses to research questions. An hour of audio data required about five to six hours' transcription together with the translation. Following Nes et al.'s (2010) recommendation, I was aware that meaning could be lost if someone outside of the research process translated the Luganda audio files. Therefore, I chose to translate while transcribing as I am proficient in the local language (Luganda), have in-depth knowledge of the research context (see section 1.8) and understood the meanings rooted in cultural expressions. For this reason, it was essential to construct meaning-based translation instead of word for word translation because not all notions are universal (Jones and Kay, 1992).

To ensure an accurate translation process that reflected connotations and meanings within the context, I applied my knowledge, understanding and identity rooted in the local culture. This
approach involved understanding the cultural nuances and interpreting the exact meanings as per the conversations as some words in Luganda are translated to mean several things in English. For example, the word 'mirembe' can be translated as 'peace' and 'generation'. When parents described how the Kiosks supported their children, they used the word 'mirembe' to indicate that the Kiosks provided them with an opportunity to develop computer skills needed for the current times. Given that I understood that the word 'mirembe' was used here to mean 'generation', I translated it according to the conversation's content. My knowledge of the contextual meanings enabled me to overcome the "cross-language" (Squires and Sadarangani, 2020, p.707) barriers that many researchers who do not have prior knowledge and experience of their research contexts face. One key barrier that these researchers face is the risk of misinterpretation when a word has several meanings, and as a result, participants intended meaning is lost. Once all Luganda interviews were translated into English, I checked all transcripts against the audio recordings for accuracy. During this initial process, participants' real names and organisation names were changed to pseudonyms to protect their privacy.

4.2. Data Mapping and Interpretation

The first step involved preparing a data grid that summarised all the generated data (see figure 4.1 to 4.5 for extracts of data grid tables and Appendix IX for complete list). All data files' names were entered into the data grid (focus group and interview transcripts, field notes, photographs, and documents), making it relatively easy to see what data was available for each participant and Kiosk. In figures 4.1 and 4.2, the 'participant data' and 'focus group data' columns display the available data for each young person. The 'carer data' column shows the interview data available for each young person's parent or carer, and the 'schooling status' column indicates whether the young person was enrolled in school or not. The 'teacher data' column outlines the interview data available for young people's teachers who participated in this PhD research. Figure 4.3 provides the data available for adult users of the Kiosks including teachers at Hillside school. Figure 4.4 outlines the data available pertaining each Kiosk and 4.5 shows data available for non-users of the Kiosks. The age, gender and schooling status of young people were included in the data grid to understand their demographics and supported the data analysis in identifying the experiences of different user groups.
### Figure 4.1: Extract for Data Grid related to Young People at Kiosk A

<table>
<thead>
<tr>
<th>Pseudonym</th>
<th>Age (years)</th>
<th>Gender</th>
<th>Participant Data</th>
<th>Carer Data</th>
<th>Schooling Status</th>
<th>Teacher Data</th>
<th>Focus Group Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>George</td>
<td>15</td>
<td>M</td>
<td>Interview transcript Field notes</td>
<td>Lucia Interview transcript</td>
<td>In</td>
<td>Mr. Williams Interview transcript</td>
<td>FG1 transcript</td>
</tr>
<tr>
<td>Patricia</td>
<td>13</td>
<td>F</td>
<td>Interview transcript Field notes</td>
<td>Anne Interview transcript</td>
<td>In</td>
<td>Ms. Jessica Interview transcript</td>
<td>FG2 transcript</td>
</tr>
<tr>
<td>Jonah</td>
<td>17</td>
<td>M</td>
<td>Interview transcript Field notes</td>
<td>Josephine Interview transcript</td>
<td>In</td>
<td>Ms. Monica Interview transcript</td>
<td>FG1 transcript</td>
</tr>
<tr>
<td>Florence</td>
<td>12</td>
<td>F</td>
<td>Interview transcript Field notes</td>
<td>Jessie Interview transcript</td>
<td>In</td>
<td>Ms. Jenna Interview transcript</td>
<td>FG2 transcript</td>
</tr>
<tr>
<td>Liam</td>
<td>16</td>
<td>M</td>
<td>Interview transcript Field notes</td>
<td>Stella Interview transcript</td>
<td>In</td>
<td>Mr. Jamison Interview transcript</td>
<td>FG1 transcript</td>
</tr>
<tr>
<td>Giul</td>
<td>11</td>
<td>F</td>
<td>Interview transcript Field notes</td>
<td>Tracy Interview transcript</td>
<td>In</td>
<td>Ms. Kim Interview transcript</td>
<td>FG2 transcript</td>
</tr>
<tr>
<td>Gift</td>
<td>15</td>
<td>F</td>
<td>Interview transcript Field notes</td>
<td>Erin Interview transcript</td>
<td>In</td>
<td>Ms. Emily Interview transcript</td>
<td>FG2 transcript</td>
</tr>
<tr>
<td>Gemma</td>
<td>13</td>
<td>F</td>
<td>Interview transcript Field notes</td>
<td>Jenifer Interview transcript</td>
<td>In</td>
<td>FG2 transcript</td>
<td></td>
</tr>
</tbody>
</table>

### Figure 4.2: Extract for Data Grid related to Young People at Kiosk B

<table>
<thead>
<tr>
<th>Pseudonym</th>
<th>Age (years)</th>
<th>Gender</th>
<th>Participant Data</th>
<th>Carer Data</th>
<th>Schooling Status</th>
<th>Teacher Data</th>
<th>Focus Group Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irving</td>
<td>13</td>
<td>M</td>
<td>Interview transcript Field notes</td>
<td>Ella Interview transcript</td>
<td>In</td>
<td>Ms. Jacinta Interview transcript</td>
<td>FG5 transcript</td>
</tr>
<tr>
<td>Jacob</td>
<td>14</td>
<td>M</td>
<td>Interview transcript Field notes</td>
<td>Sherry Interview transcript</td>
<td>In</td>
<td>Mr. Ivan Interview transcript</td>
<td>FG5 transcript</td>
</tr>
<tr>
<td>Jack</td>
<td>14</td>
<td>M</td>
<td>Interview transcript Field notes</td>
<td>Rita Interview transcript</td>
<td>In</td>
<td>Ms. Jacinta Interview transcript</td>
<td>FG5 transcript</td>
</tr>
<tr>
<td>Caroline</td>
<td>14</td>
<td>F</td>
<td>Interview transcript Field notes</td>
<td>In</td>
<td>FG6 transcript</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salim</td>
<td>14</td>
<td>M</td>
<td>Interview transcript Field notes</td>
<td>Out</td>
<td>FG6 transcript</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Figure 4.3: Extract for Data Grid related to Adults at Kiosk A and B**

<table>
<thead>
<tr>
<th>Pseudonym</th>
<th>Participant Data</th>
<th>Kiosk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jessica (teacher)</td>
<td>Interview transcript</td>
<td>A</td>
</tr>
<tr>
<td>Elaine (teacher)</td>
<td>Interview transcript</td>
<td>A</td>
</tr>
<tr>
<td>Jane (teacher)</td>
<td>Interview transcript</td>
<td>A</td>
</tr>
<tr>
<td>Jeana (teacher)</td>
<td>Interview transcript</td>
<td>A</td>
</tr>
<tr>
<td>Jason</td>
<td>Interview transcript</td>
<td>A and B</td>
</tr>
<tr>
<td>Jerry</td>
<td>Interview transcript</td>
<td>A</td>
</tr>
<tr>
<td>Eddie</td>
<td>Interview transcript</td>
<td>B</td>
</tr>
<tr>
<td>Larry</td>
<td>Interview transcript</td>
<td>A</td>
</tr>
</tbody>
</table>

**Figure 4.4: Extract for Data Grid related to the Kiosks**

<table>
<thead>
<tr>
<th>Pseudonym</th>
<th>Files</th>
<th>Kiosk</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kiosk A</td>
<td>Pictures of the school and the Kiosk</td>
<td>A</td>
<td>To illustrate the research context</td>
</tr>
<tr>
<td>Kiosk A</td>
<td>Kiosk gatekeepers Interview transcripts Field notes</td>
<td>A</td>
<td>Interview transcripts for teachers at the school; Elaine, Jessica and Jane and Jason (community gatekeeper) Interview with school owner Steve</td>
</tr>
<tr>
<td>Kiosk A</td>
<td>Focus group with Kiosk stakeholders</td>
<td>A</td>
<td>Information for RQ3</td>
</tr>
<tr>
<td>Nelson</td>
<td>Helping Hands representative Interview transcript</td>
<td>A and B</td>
<td>Background information</td>
</tr>
<tr>
<td>Skills to Survive website</td>
<td>Skills to Survive 2017 report</td>
<td>A and B</td>
<td>Background information</td>
</tr>
<tr>
<td>Karen</td>
<td>Skills to Survive Initial interview notes Interview transcript</td>
<td>A and B</td>
<td>Background information</td>
</tr>
<tr>
<td>Steve (Hillside school representative)</td>
<td>Interview transcript</td>
<td>A</td>
<td>Information on RQ3</td>
</tr>
<tr>
<td>Anna (community member)</td>
<td>Interview transcript</td>
<td>A</td>
<td>Information on RQ3</td>
</tr>
<tr>
<td>Kiosk B</td>
<td>Pictures of the Kiosk and the surrounding environment Field notes</td>
<td>B</td>
<td>To illustrate research context</td>
</tr>
</tbody>
</table>
Organising the data into the above data grids made the analysis process manageable, making it easy to locate the data pertaining to each component identified in figure 3.1, which was developed in alignment with the elements of the sociocultural perspective discussed in section 3.1. I then re-read data transcripts and field notes to familiarise myself with each data content and obtain an in-depth understanding of responses to organise the data in thematic tables around figure 3.1’s components.

Thereafter, a description for each component in figure 3.1 was formulated to guide the construction of thematic tables. The figure's components comprise the individual users, community, and Kiosks (tool), which are all situated within the sociocultural environment. The individual users encompass the perspectives of users of the Kiosks and their experiences with the Kiosks. Community entails the broader groups of people, i.e., teachers, parents, and other community members views about the Kiosks. The Kiosks (tool) encompasses of data on the two Kiosks. The description of this data categorisation is presented in table 4.1 below. Table 4.2 provides an example of what it looked like for one participant.

<table>
<thead>
<tr>
<th>Pseudonym</th>
<th>Age (years)</th>
<th>Gender</th>
<th>Participant Data</th>
<th>Schooling Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shakira</td>
<td>15</td>
<td>F</td>
<td>Interview transcript</td>
<td>In</td>
</tr>
<tr>
<td>Jade</td>
<td>11</td>
<td>F</td>
<td>Interview transcript</td>
<td>Out</td>
</tr>
<tr>
<td>Sara</td>
<td>16</td>
<td>F</td>
<td>Interview transcript</td>
<td>In</td>
</tr>
<tr>
<td>Tina</td>
<td>13</td>
<td>F</td>
<td>Interview transcript</td>
<td>Out</td>
</tr>
<tr>
<td>Jamal</td>
<td>11</td>
<td>M</td>
<td>Interview transcript</td>
<td>In</td>
</tr>
<tr>
<td>Eric</td>
<td>12</td>
<td>M</td>
<td>Interview transcript</td>
<td>In</td>
</tr>
<tr>
<td>Jay</td>
<td>13</td>
<td>M</td>
<td>Interview transcript</td>
<td>In</td>
</tr>
<tr>
<td>Julius</td>
<td>12</td>
<td>M</td>
<td>Interview transcript</td>
<td>Out</td>
</tr>
</tbody>
</table>
Table 4.1: Data Categorisation for Thematic Table

<table>
<thead>
<tr>
<th>Framework Element</th>
<th>Data Content Description</th>
</tr>
</thead>
</table>
| Individual users  | User social and cultural background  
                      Views on the Kiosks  
                      What activities are users involved in at the Kiosks, information on individual and peer learning and knowledge acquisition  
                      What impact has the knowledge acquired or activities at the Kiosks had on supporting users with their activities and interests?  
                      Enablers/barriers to access and utilisation. Highlight where users express conflicting views about the reality at the Kiosks. This includes tensions within the responses of users and between different users  
                      Views on sustainability of the Kiosks  
                      Influences of users of the Kiosks on the community |
| Community         | The communities views about the Kiosks/ Assigned meaning  
                      Enablers/barriers to access and utilisation  
                      Influences of community on users  
                      Views on sustainability of the Kiosks |
| Kiosks (tool)     | Process of initiation and implementation  
                      The organisation/structure at each Kiosk  
                      Enablers/barriers at each Kiosk. Any discussion of what might be limiting access and utilisation  
                      Local partner and community engagement  
                      Ownership/responsibility for the Kiosks  
                      Maintenance/repair  
                      Views on sustainability from the two organisations; Skills to Survive and Helping Hands |

Table 4.2: An example of completed Data Categorisation Thematic Table

<table>
<thead>
<tr>
<th>Framework Element</th>
<th>Data Content Description</th>
</tr>
</thead>
</table>
| Individual users  | **User social and cultural background**  
                      **Liam:** Male, 14 years old in his second year of secondary education, lived with mother and five brothers one and half mile away from Kiosk A towards the south. He attended Greenville Secondary School which was approximately two and a half miles west of the Kiosk and started using the Kiosk in 2016 (FGD, Interview and Field notes)  
                      **Views on the Kiosk**  
                      **Khadija:** Does the [Kiosk] complement or distract your formal |

Khadija A Mohamud  
The Open University
education?

**Liam:** It can be both because if someone is at this school, they are using it in their lessons and we come from another school and we have come to get some work. But if we come when it is school hours for them, because sometimes we finish early, these children will not concentrate on their work. So that is why they don’t allow us to use during the day in the term (FGD)

**Purposes of use/ activities involved**

**Liam:** It helps me in many things like learning piano. In some subjects. Biology and History and even commerce and also Computer.

**Liam:** The classifications in Biology. Through my research I learnt and understood the five kingdoms; animal; plants; fungi; bacteria and amoeba, I don’t know how to pronounce the scientific classification names. There are many classification kingdom, in animal kingdoms and plant kingdoms, so they arrange them in kingdom then phylum then class then order then family then genus then species like that. So that’s where the classification comes from, like the human is called Homosapien yeah. After I’ve learnt in class because I cannot take my research, I first listen to the teacher then I go and research. Sometimes the teacher sends us and sometimes I just go on my own. I go and tell him or her what I found after doing the research.

**Liam:** In History, I researched the Bantu and the Hamites. I learnt about the migration of the Bantu to East Africa from their homeland West Africa; what caused their migration they came to settle here because of some problems; and why their migration was important to East African History. Who are the Hamites, Contribution of Hamites in Uganda. They [Bantu] had internal conflicts between themselves and external between the neighbours and because of some diseases which they could avoid themselves from, so they came this side to avoid those diseases. I also researched about other migrations like Cushitic and Nilotic migrations from their homeland.

**Liam:** In Commerce, I use it for business calculations. In business calculations, uhm, just calculating when you get, they say that in businesses, you get like the, it’s like Maths, because you get, they can give you like twenty thousand and you can divide it by two until like a z, you looking for that z to get the answer, yeah.

**Liam:** In computer, I researched about the functions of a computer.
I learnt the classifications of a computer or generations. I am so interested in computer science, so I went to research on Khan Academy and BBC Bitesize some basics of programming. This is the method of creating some instructions that tell the computer how to perform tasks. So, I learnt the operating systems are the ones that control the computer. And after that, I learnt the modes of operation like multi-tasking, this is when many programmes are running at the same time for example, when an email is being sent and at the same time downloading a web page. Another one is batch processing this is when data is collected together in a group for example, for bills like electricity and invoices.

Liam: Yeah, I also used to go and get, actually learn from there, piano and keyboard. Before that I did not know how to play the piano. I learnt by getting the codes from the internet from it for some songs.
Khadija: Where do you play it?
Liam: Here at the church.
Khadija: Okay. Do you have a piano here?

Liam: We have a keyboard not the piano.

Liam: To watch the news around the world, know about current issues and some things. Like music. Maybe for fun, to watch some movies (All the above from the Interview).

Liam: I learnt how to make a speaker on YouTube. I would have shown you, but I don’t have the materials now, but I can explain it for you. I used a plastic cup, magnet, the bottle cover of a Coca Cola bottle, superglue and sellotape. First, I put the cup facing down and I put the magnet on top of it and put superglue, so it does not move. Then I put the copper wire around the bottle cover many times and left a little bit on two sides. Then I put superglue on the bottle top cover, and I fixed it on the magnet. Then those parts of the wire that remained I used it to stick together with a small earphone wire that got spoilt but I cut it and only remained with the part that you plug to the phone. Then I connected the copper wire with that part, and I covered with a sellotape. I tried using it on my brother’s phone and it was working (FGD).

Barriers to access and utilisation
Liam: The adults come and push us away; these big people come and chase us away so that they can use.
Khadija: So, who are these people who chase you away?
Liam: Some they are there down after taking their marijuana and alcohol in front of the children especially in the evenings, they just come, I don’t know their names. They are from the community (Interview)

Liam: Even though we try to report, the other guys come when they are drunk, and they want to beat us up telling us to go away from the [Kiosk]. Even though someone is the leader, they don’t mind they will just beat us, and we have nowhere to report.

Khadija: Okay. Are there any other challenges you face whilst using the [Kiosk]?

Liam: Yes, the problem is they gave us the same time to use the [Kiosk] as these older men so when they find us using, they chase us away so they can use (FGD). Those guys with phones make me jealous because for them they can use the WiFi and don’t face all the problems we face. Even now, the WiFi is still working and they can use. (FGD)

Views on sustainability

Khadija: Do you know the issues that contribute to the [Kiosk] breaking down?

Liam: Yes, they keep stealing wires from that computer that is why it is getting spoilt (Interview).

Weekends we have time to use it, but it switches itself off, these guys they call it data that is off. Then it does not work on some public holidays and Saturdays and Sundays and even now it’s not working (FGD).

Community Views on the Kiosk

Mr. Janardan (Liam’s computer teacher): Liam is very interested in computer science and we have a computer lab, our policy here is, it is only opened when a class has a computer lesson and closed during other hours to avoid students from wasting a lot of time there. But it is a good thing [Liam] found a computer somewhere else to explore his interest in computer science (Mr. Janardan, Computer teacher, Interview).

Liam’s mum: That computer has helped our children to learn many things, to research and learn new things. He has been doing research for his schoolwork there and also learning new things which he likes to try. The other time he was making a speaker and he told me he learnt how to do it on the computer (Interview).

Organising the data into thematic tables provided me with a systematic structure of the data built around my understanding of the sociocultural perspective in relation to this PhD. It also made it easy
for me to conduct cross case analysis which facilitated the identification of emerging patterns within the data.

4.2.1. Generating Codes

After all the data were organised into thematic tables, I re-read the tables to ensure all data in the transcripts were captured. I imported all thematic tables to NVivo 12 plus software which facilitated the inductive data analysis. I chose to analyse using NVivo 12 plus in preference to manual coding because using an analysis software made it easier for me to count and identify recurrent codes and data relevant to each research question. This was important in identifying the themes that emerged from the data. After this, I highlighted textual chunks within the tables and grouped them into nodes or, more simply, codes that represented their meanings. Codes are a collection of references within the data that form the foundation for themes across the data set (Nowell et al., 2017). To examine what each participant was communicating, I adopted some suggested questions Charmaz (2003 in Gibbs, 2018, p.57) to guide the coding process:

- What is going on in the text?
- What is the person saying?
- How do structure and context (sociocultural environment) serve to support, maintain, impede, or change what is going on?

I used the annotation feature on NVivo to support this process. Figure 4.6 provides an example data extract, and table 4.3 illustrates how these questions guided the coding using the example in figure 4.6.

**Figure 4.6: Example Data Extract illustrating the Coding Process**

<table>
<thead>
<tr>
<th>Annotations</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td>Context</td>
</tr>
<tr>
<td></td>
<td>This text shows that theft and security led to the sustainability issues the Kiosk faced. The text also shows there was a divide between the different groups, in this instance this person is saying that people who did not associate with the school stole wires from the Kiosk. Understanding the sociocultural environment helps to explain the relationship between the school and community and to understand the security of the context.</td>
</tr>
</tbody>
</table>

Khadija A Mohamud

The Open University
Table 4.3: Illustration of how the guiding questions were incorporated in the coding process

<table>
<thead>
<tr>
<th>Guiding question</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is going on in the text?</td>
<td>In the example in figure 4.6, the text shows that theft and the absence of a security personnel at the Kiosk led to the sustainability issues the Kiosk faced. The text also shows there was a divide between the different groups and in this instance this person is saying that people who did not associate with the school stole wires from the Kiosk.</td>
</tr>
<tr>
<td>What is the person saying?</td>
<td>This example shows that a challenge of theft existed in the community which strained the relationship between the school and community, hence supports what is being said.</td>
</tr>
<tr>
<td>How do structure and context (sociocultural environment) serve to support, maintain, impede, or change what is going on?</td>
<td>The length of the generated codes ranged from a sentence to a paragraph at all phases of the data set. For instance, in the example extract above, the first and second sentences were coded as 'theft', and the third sentence was coded as 'security'. This initial coding produced a long list of codes which were then reviewed and refined. The process involved merging codes with elements that could not be separated. For example, initially, 'student-led research', 'teacher-initiated research' and 'understanding concepts in school topics' were coded as separate codes. However, an analysis of the data extracts in each code revealed elements could not be separated; for this reason, these codes were merged into one code named 'understanding school subject concepts'. Additionally, some codes were renamed to give more insight into what the data represented; for example, 'knowledge acquisition' was renamed as 'supporting tasks'. At this initial code generation phase, all codes were retained, including those that did not have sufficient data to exist on their own, such as 'weather'. Due to the large amounts of data generated, the coding process took place over a long period and took six iterations of refining the codes. The figures below illustrate NVivo screenshots of the final extracts of codes identified across the data. Figures 4.7, 4.8 and 4.9 below provide the final extracts for RQ1, 2 and 3 respectively.</td>
</tr>
</tbody>
</table>
Figure 4.7: Extract of Codes for RQ1

- Name
  - Social barriers
  - Operational barrier
  - Resource constraint
  - Safety concerns
  - Weather constraint
  - Domestic responsibilities
  - School restrictions
  - Limited technology experience
  - Password restriction
  - Parental restriction
  - Timetable
  - Attitudes and Support

Figure 4.8: Extract of Codes for RQ2

- Name
  - Understanding school subjects concepts
  - Social impact
  - Computer literacy
  - Parental perception
  - Perceived Enjoyment
  - Teacher perceptions
  - Peer learning
  - Pornography
  - Information seeking
  - English vocabulary
  - Extend an interest
  - Increased motivation and self-belief
  - Resource support
  - Collaboration
  - Problem solving
  - Community learning
  - Financial gain
  - Social vices
  - Current Affairs
  - Leadership
  - Supporting users tasks

Figure 4.9: Extract of Codes for RQ3

- Name
  - Power asymmetry
  - Stakeholder engagement
  - Management
  - Vandalism
  - Design constraint
  - Maintenance constraint
  - Theft
4.2.2. Searching for themes and reviewing

After completing the coding process, I re-read data extracts in each code and identified relationships between the different codes and categorised them into sub-themes. Miscellaneous codes that did not fit in any of the categorisations were also retained in separate free nodes to ensure that they were not lost. For example, I kept ‘perceptions about other people’ and ‘distance’ in free nodes as they did not belong to any categorisation. Figure 4.10 below presents an extract example of how codes for research question two were categorised into sub-themes. The sub-themes were ‘learning’, ‘perceptions about young people’s progress’, ‘information’, ‘quality of life’ and ‘limitations’.

**Figure 4.10: Extract example showing the categorisation of codes on NVivo**

Following this initial categorisation, all data extracts were re-read, and the sub-themes were further categorised into themes. After that, I revisited the miscellaneous codes and assessed where they could fit in the sub-themes. For example, ‘perceptions about other people’ fitted into both ‘learning’ and ‘limitations’ as participants talked about other people accessing ‘information’ under ‘learning’ and a few others accessing ‘pornography’ under ‘limitations’. Codes that did not fit in existing sub-themes and did not have sufficient data for a new sub-theme to be developed like ‘distance’ were discarded. I then considered each sub-theme in relation to others by searching for patterns across the broader sub-themes and within the data extracts to categorise them into themes. Some sub-themes formed an overarching main theme, and other sub-themes were refined into the main overarching themes.
For instance, in the example extract presented in figure 4.10 above, 'learning', 'quality of life' and 'limitations' formed main overarching themes, and 'young people's progress' and 'information' were categorised under the theme of 'learning'. This refinement process took four iterations before the final refined themes were identified and named.

Furthermore, there were meaningful silences that were identified during the thematic analysis that needed interpretation and analysis. Mazzei (2007) highlights that one of the implicit characteristics of coding processes in qualitative research is only coding what can be seen in participants' words and ignoring meaningful silences. However, Rosiek and Heffernan (2014) argue that interpreting meaningful silence, which is seen in the form of a pattern of avoidance, evasion, or suppression, is as vital as analysing what is said as it highlights imbalanced power dynamics. Thus, the critical postcolonial lens discussed in the previous chapter provided an appropriate lens for understanding the imbalanced power dynamics to interpret these meaningful silences. The post-structural concepts specifically examined the fixed structures within the social interactions to provide an explanation for how people’s behaviour and actions are influenced by those who hold power to interpret instances of meaningful silence within the context of this PhD research. The first step to identifying the presence of power dynamics in the data expressed as silence enveloped in the form of evasion was reflecting on my prior experience of the context and culture (as discussed in section 1.9) which provided me with the ability to recognise how the expression of power was played with silence within this context and examining how this was revealed throughout the data. An example of the occurrence of silence that transpired in the form of evasion was identified in the data when Nelson, Helping Hands representative noted that theft was an anticipated issue that would affect the Kiosks. However, it was not raised with Skills to Survive as shown in the excerpt below.

**Khadija:** …Did you inform [Skills to Survive] about the theft issue?

**Nelson:** It was difficult because they had a certain way that they wanted the project to be done. But you know, the beauty about the [Kiosks] and [Skills to Survive] itself is that uhm, there’s a concept of community involvement from the word go. […] silence 5 seconds] But then you know within communities, there are people who support the initiative and then there are those who don’t support the initiative…
In the excerpt above, it is seen that Nelson avoided further discussing how Skills to Survive wanted the project to be implemented by shifting blame to the complex situation within the context. This suggests that decisions were influenced by those who held power, in this case, Skills to Survive, thereby preceding the context reality. This will become clearer in the next chapter, where the relationship between the two organisations and the communities are discussed in detail (see section 5.1). The existing power dynamics were coded as ‘power asymmetry’ under the theme of stakeholder engagement in research question three data and discussed in detail in chapter 8 (see section 8.1).

Following the analysis of meaningful silence in the data, thematic maps were constructed to represent the final themes, sub-themes, and associated codes (see figures 4.11 to 4.13 below). The core concepts of access, impact, and sustainability, which the research questions focus on, are presented in green. The colour code for the thematic maps are as follows, maroon for main themes, pink for sub-themes and blue for codes. Elements in each thematic map are unpacked in subsequent chapters six, seven and eight, where data for each research question are discussed in detail.
Figure 4.11: Thematic Map for RQ1
Figure 4.12: Thematic Map for RQ2
Figure 4.13: Thematic Map for RQ3

Key

<table>
<thead>
<tr>
<th>Shape</th>
<th>Meaning</th>
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<tr>
<td>Green</td>
<td>Core concept (RQs focus)</td>
</tr>
<tr>
<td>Red</td>
<td>Theme</td>
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<tr>
<td>Blue</td>
<td>Code</td>
</tr>
<tr>
<td>Arrow</td>
<td>Leads to</td>
</tr>
</tbody>
</table>

Sustainability

Stakeholder Engagement
- Community Leadership
- Power Asymmetry
- Involvement
- Expectations

Influences

Technological Design and Maintenance
- Design constraint
- Theft and Vandalism
- Maintenance constraint
- Unreliable Internet
4.3. Development of the Context Complexities Framework

The data analysis led to developing the proposed Context Complexities framework (presented in chapter eight), grounded in the sociocultural lens that frames this PhD research. Context Complexities was chosen as the framework's name because understanding the social and cultural structures and existing problems within is crucial in determining the success of an intervention. Therefore, the name was selected to reflect the interlinkage between the existing structures and issues that affected the Kiosks usage and impact. The Context Complexities framework aims to facilitate negotiations between the different stakeholders to create a common consensus in alignment with the reality of the social and cultural context informed by the postcolonial participatory design literature (see section 2.7).

Using the sociocultural lens, I examined all the developed thematic maps by re-reading all the data extracts to understand the complexities within the context that were not recognised in the Kiosks' design and implementation processes, thereby affecting the access, impact, and sustainability of the Kiosks. This iterative process identified codes and their associated data extracts that indicated the complex aspects within the context, pre-existing complexities and new complex issues that came with the Kiosks. Both types of complexities affected the usage, impact, and sustainability of the Kiosks. The codes that formed the foundation of the proposed Context Complexities framework are as follows: social barriers, domestic responsibilities, attitudes and support, school restrictions, limited ICT skills, security concerns, resource constraint, connectivity and operation, pornography, social vices, community leadership, power asymmetry, involvement, expectations, design constraint, theft and vandalism, maintenance constraint and unreliable internet. These codes emerged from all the three thematic maps from the themes that highlighted barriers to accessing the Kiosks, limitations that Kiosk users faced and issues with sustainability of the Kiosks to demonstrate the complex context issues that needed to be considered.

- Social barriers, domestic responsibilities, attitudes and support, school restrictions and, limited ICT skills emerged from the structural barriers sub-theme. Security concerns and resource constraint and connectivity and operation emerged from safety and operational barriers sub-themes respectively. These were all under barriers to access theme in RQ1 thematic map.
- Social vices and pornography emerged from the limitations theme in RQ2 thematic map.
- Design constraint, theft and vandalism, maintenance constraint and unreliable internet emerged from the technological design and maintenance theme in RQ3 thematic map. On the other hand,
community leadership, power asymmetry, involvement and expectations emerged from the stakeholder engagement theme in RQ3 thematic map.

I re-read all the data extracts in each code and noted that the key emerging pattern across the dataset was that the barriers and limitations existed due to the gaps in understanding the context thoroughly and embedding the Kiosks within the social and cultural environment. So, this led to the concept of community involvement and ownership. The second concept that emerged from the stakeholder engagement and technological design and maintenance codes were from the issues with sustainability of the Kiosks. This was intertwined with the community involvement and ownership concept as it highlighted the issues of sustainability existed due to gaps in the stakeholder engagement to understand what the community needs were and the context so the design could match with the context and community needs. These vital concepts led to the formulation of three core aspects that became the components of the proposed Context Complexities framework as follows:

- Co-creation with stakeholders (social, financial, and organisational sustainability)
- Localisation of design (technological and social sustainability)
- Nurture local community ownership (organisational sustainability)

The development of the framework components also identified a need to assess the effectiveness of processes within them, which led to embedding process and impact evaluation within the proposed framework. The description for each component of the framework is presented below.

Co-creation with stakeholders emerged as the first component of the framework since the complexities that emerged from the data analysis revealed a gap in the processes adopted in the Kiosks' design and implementation. The elements in this component cover aspects that encourage social, financial, and organisational sustainability. Localisation of design emerged as the second component as the themes for research question one and three indicated technological complexities. The elements in this component encompass processes and activities that will lead to promotion of technological and social sustainability. Nurture local community ownership became the third aspect of the framework since the data analysis showed a gap in this area and links this component with the first two components. The elements in this component entail processes to encourage organisational sustainability. Finally, process and impact evaluation are embedded throughout the processes in the proposed framework. Each component of the Context Complexities framework with its elements are discussed in detail in chapter eight.
Developing the proposed framework started on a paper where I created links between the different components and embedded process and impact evaluation into the framework. I then progressed to develop the framework on Creately, a visual designing software tool. It took several iterations of refining the Context Complexities framework before constructing a final version presented later (see figure 8.1).

4.4. Summary

This chapter described the procedures undertaken to analyse the data for this PhD which led to identifying the emerging themes and sub-themes. This process led to the construction of thematic maps that became the foundation of the proposed Context Complexities framework presented later (chapter eight). The findings from this analysis are presented and discussed in succeeding chapters. For the reader to make sense of the research context, the next chapter presents data on the two Kiosks and their setting.
Chapter 5: Background of the Kiosks and Participants

This chapter provides a background of the Kiosks and their setting for the reader to gain an understanding of the research context. The chapter describes the processes involved in setting up the Kiosks and provides a detailed narrative of each Kiosk and its organisation (section 5.1). It also outlines the complexities that existed within the research context (section 5.2), which played a crucial role in determining the Kiosks' functionality and success.

5.1. Process of Kiosks set-up

The idea of the Kiosks’ initiation began when the Founder of Skills to Survive visited a remote location in Ethiopia and witnessed the shortage of teachers. As outlined earlier (see section 1.8), the Kiosks ideation were inspired by a TED talk and encompassed internet-enabled computers and WiFi which led to the creation of Skills to Survive in 2013 and building of the first Kiosk in Nigeria which had two computers and WiFi (Skills to Survive, n.d). Throughout the presentation of this PhD research findings, when I refer to the Kiosk, it means both the computers and WiFi; I clarify when referring to only one of them. Skills to Survive outline on their website that the Kiosks' official purpose was to bridge the challenges facing education in low-income communities through providing these communities with access to the Internet and educational software (Skills to Survive, n.d).

With an interest to scale the project to other parts of Sub-Saharan Africa, Skills to Survive obtained funding from a UK donor (Skills to Survive, 2017) and was introduced to Helping Hands through the networks Skills to Survive had. Helping Hands was a local organisation established by a white American in Uganda that distributes literacy books and resources to low-income communities. Since Helping Hands' focus was on education, it aligned with the aims of Skills to Survive.

… we came to learn about [Jay] and his organisation [Helping Hands] in Uganda through a friend and partnered after the funding we received from [donor organisation].

(Karen, Skills to Survive representative, Initial phone call interview notes)

Although majority of the staff at Helping Hands were local Ugandans, the operations of the organisation was led by non-Ugandans and the partnership between Skills to Survive and Helping Hands was formed at the high organisational level. Skills to Survive noted the expectation was for Helping Hands to be the implementing partner that conducted the community mobilisation and facilitated building of the Kiosks as they were better placed to do so since they worked with local communities in Uganda.
… I thought we need to get the community work right… and this is why we partnered with [Helping Hands] to open avenues to the communities and assist us in conducting the preliminary community work, organise logistics and supporting us in building the [Kiosks]…

(Karen, Skills to Survive representative, Interview)

It was clear that the partnership between Skills to Survive and Helping Hands was created for Helping Hands to implement the project. However, the data suggests that Helping Hands staff who worked with the low-income communities did not have sufficient information about the project as Helping Hands were not involved in the project’s initial development. Due to this, they required Skills to Survive to describe the details of the project to the communities.

… [Skills to Survive] reached out to [Helping Hands] …it was myself and our CEO for [Helping Hands, Jay] who went out to the communities. One, to identify the communities and two, to bring the whole concept of the [Kiosks]… For us our role to mobilise the community and to let them know of this beautiful project that was coming. Then [Karen] and [Kennedy] [from Skills to Survive] came and broke it down exactly what the project entailed.

(Nelson, Helping Hands representative, Interview)

Despite having insufficient information about the project, the data shows that the mobilisation of the project proceeded as Helping Hands selected the locations of the Kiosks to be where they worked and the communities that they had relationships with, which made penetration easy.

…all these communities that we set up the [Kiosks] in, we had at least prior knowledge about them, and we had connections with the leaders of these communities, so the entry was actually easier…

(Nelson, Helping Hands representative, Interview)

Although Nelson indicated that Helping Hands conducted a sequence of meetings with the communities prior to the Kiosks being built, it was unclear how the meetings were organised and what information was covered. However, it was evident that Skills to Survive had some intended purposes of the Kiosks that they outline in their website as to "provide access to online learning and bridge the digital divide" (Skills to Survive, n.d). Nevertheless, it seemed that these objectives were not covered in the initial meetings with the community and were described after Helping Hands was approached by the community. This suggests that no structure guided the initial discussions with the community to ensure that all the key aspects of the project were communicated.

… there were series of meetings before we began the real actual building and even during the actual building of the project… after we built the [Kiosk], someone asked me one time, ‘what is the real use of the [Kiosk]?’ …what we did was instead of talking to one individual we organised for a community
meeting… we talked about the uses of the [Kiosk]… For them to use it for learning and to provide them with access to the Internet.

(Nelson, Helping Hands representative, Interview)

There were gaps in how the project was conveyed to the communities. Despite this, the data from Kiosk A shows that the community could influence the location of the Kiosk.

… I happened to seat in the committee when they were planning… They [Kiosk developers] wanted to put it [Kiosk A] at the trading centre but we thought the trading centre will be too open… I was one of those people who suggested the best place would be in the school because the children would benefit, and teachers would research. We also hoped that security would be guaranteed…

(Anna, parent, Kiosk A, Interview)

Nelson also described how they involved the communities in the building of the Kiosks as follows:

…we had planning meetings in the morning you know. Like okay this is our goal today, this is what we shall be doing, setting up the benches, who is going to participate in the setting up of the benches, this is the kind of the materials we need, so that was the entire process.

(Nelson, Helping Hands representative, Interview)

This was corroborated by one community member from Kiosk A who stated how she participated and noted that the community were actively involved in the building process of the Kiosk.

I participated in what I could like you know ferrying stones here and there… I mobilised a number of boys and they did whatever they could, it was a communal thing. At least [Jay, Helping Hands] did a very nice thing… he wanted everybody to participate and feel it’s our thing.

(Anna, parent, Kiosk A, Interview)

Both Kiosks were built in October 2015 together with two other Kiosks in Western Uganda (Skills to Survive, 2017). Although Nelson indicated that they had involved both communities where the Kiosks would be located, this was only evident in the case of Kiosk A where participants indicated their involvement. However, there was no data to support the same happened at Kiosk B. During my fieldwork, I had interactions with the market vendors who worked near the Kiosk. One of them who had been working there since 2015 indicated:

We were not informed what it [Kiosk B] was about, we just saw them building and later we saw people gathering around it. We just don’t know who is supposed to take care of it.

(Market Vendor, Kiosk B- Field Notes January 2018)
In reflecting on the process Skills to Survive and Helping Hands undertook, Karen, Skills to Survive representative acknowledged that the project was not assimilated at Kiosk B’s location, stating:

… all we have to think about is how we integrate the project in that particular location [Kiosk B]…

(Karen, Skills to Survive representative, Interview)

The data shows that the communities did not know that the project was implemented by two organisations and had assumed that the project originated from Helping Hands since a relationship between them existed. The reason for this assumption was because Helping Hands’ senior management comprised of international staff.

I know that we had those equipment brought to the school from our friends [Helping Hands]…

(Mike, parent, Kiosk A, Interview)

The lack of distinction between the two organisations emerged throughout the data and the difference became explicit when the names of individuals were mentioned. This suggests that sufficient information about the project’s origin were not shared with the communities.

To ensure that the Kiosks users had access to the Internet, Skills to Survive and Helping Hands partnered with a local telecommunication provider to deliver Internet access to the Kiosks for free through its corporate social responsibility strategy.

I think we are really fortunate that the partnership with [One Net] through its CSR plan is still coming through in terms of the data, …[One Net] has still kept on having the data running through all the [Kiosk] for free, absolutely at no cost…

(Nelson, Helping Hands representative, Interview)

The local telecommunication provider outline assigning a budget to support health and education ICT inclusive projects in their corporate social responsibility statement on their website (Name hidden to protect privacy, 2019).

This section has described the processes that were involved in establishing the Kiosks. Subsequent subsections present each Kiosk and its features and discuss their organisation after being installed.
5.1.1. Kiosk A

Kiosk A was built at Hillside school, a small low fee-paying school that catered for both nursery and primary age children. The settlement where Kiosk A was located had two schools; Hillside and Greenville a government secondary school where majority of the young people who were users of Kiosk A and took part in this PhD research were enrolled. The images below show the layout of the environment where Kiosk A was located. Figure 5.1 illustrates the different buildings of the school including a church that was used by the local community (the cream wooden building). The Kiosk is located in between the alley of classrooms at the edge of the hill (where the arrow points in the image below). The next two images provide a closer view of the Kiosk (see Figure 5.2 and 5.3).

**Figure 5.1: The School Environment**

![Image of the School Environment]

**Figure 5.2: Position of Kiosk A**

![Image of Kiosk A's Position]
When the Kiosk was built, the data shows that Skills to Survive and Helping Hands had introduced in the beginning logins for users to have a record of users at Kiosk A. However, no data existed to show the same approach was applied at Kiosk B.

… I mean we are going from here across to [local community X] and with new people coming to use the [Kiosk] every day, how are you going to ensure that everyone feels included? It comes back to the idea of the user log in, so everyone would have a username so when registering for an account, it shows the community the person is coming from, so for example, ‘I’m coming from [local community A], I’m coming from [local community B], that’s the way we wanted it to be initially…

(Nelson, Helping Hands representative, Interview)

The data also shows that the school assumed responsibility for Kiosk A and managed it with Helping Hands since October 2015 as indicated by Ms Jane, a teacher at Hillside school.

For the past years I’ve been running the [Kiosk] with the people of [Helping Hands] and the DOS [Director of Studies] …

(Ms. Jane, teacher, Kiosk A, Interview)
The findings indicate that Hillside school put restrictions to when other users who were not students at the school could access and utilise the Kiosk as indicated by Ms. Jessica, a teacher:

…we told them [other users] that during school hours they aren’t supposed to be here… They can only come after we have sent the pupils to go back home and on weekends…

(Ms. Jessica, teacher, Kiosk A, Interview)

In the view of Ms. Jane, it became important to set regulations to when other users who were not students at the school could utilise the Kiosk.

…it could have interrupt us, but we put strict rules that the village, the community are not allowed to use the computer until we close the school. These are the working days, and the community are allowed to come from five pm.

(Ms. Jane, teacher, Kiosk A, Interview)

Ms. Jane also outlined that having regulations for use of the Kiosk by users within the school became crucial as well as the lack of regulations interrupted the normal functioning of the school.

…at the beginning, teachers would just come to the [Kiosk] at any time. So, we can put strict rules about using the computer. The Director of Studies told them that she wants them in their classes following kids work except when they are free on the timetable…

(Ms. Jane, teacher, Kiosk A, Interview)

She added that a schedule for students within the school to use the Kiosk without teacher intervention was also developed.

For school days we made a timetable… we said that each class has a time as the school is open from Monday to Saturday. […] So, boys use it one side and girls the other side, if one group was there at break time, the second group will be there at lunch time. The last group comes at four pm. We wanted every kid to benefit from the computer. Those times we leave them to make discovery for themselves without a teacher.

(Ms. Jane, teacher, Kiosk A, Interview)

The preliminary discussions with the Kiosk caretakers and Helping Hands representative revealed a committee was formed to oversee the Kiosk where each representative was assigned duties and managed different user groups.

The committee comprised of five members; a chairman who managed adult community users, a women representative who ensured female users had access and utilised the Kiosk, a child representative who encouraged young people to utilise the Kiosk, a maintenance person who was in charge of cleaning and
tidying up the Kiosk, and a representative from the school senior management for the overall management of the Kiosk.

(Field notes, January 2018)

The committee was, however, established at a later stage as outlined by Ms. Jane who suggested that it reduced work for her.

…we have just elected the committee just recently. Because we have seen people with interest and to decrease the work.

(Ms. Jane, teacher, Kiosk A, Interview)

George, the representative for children within the committee clarified when the committee was formed and indicated having only one meeting since its establishment.

The last time to meet with them was the first time we decided to form a committee. It was in the last holiday [school holidays] of last year [December 2017]. The holiday which you came to discuss with us, the first time you came.

(George, 16, in-school boy, Kiosk A, Interview)

Nelson the representative from Helping Hands also outlined the committee was formed at a later stage and indicated that its purpose was to encourage community ownership suggesting that it was a strategy for sustainability.

…But as we came to the time of transitioning, we had to select what we call Community [Kiosk] Committee. So, these committees are also ensuring that its continuity of the project even if [Skills to Survive] and [Helping Hands] are not involved really hands on.

(Nelson, Helping Hands representative, Interview)

Through this committee, Hillside school established a timetable for different user groups to access and utilise the Kiosk during weekends and school holidays as outlined by Ms. Elaine.

…we [the school through the committee] had set different times for different groups for school holidays. We have time for girls and ladies from two to six pm… Then the kids come from nine am to noon… Then other hours, men, and male youth…

(Ms. Elaine, teacher, Kiosk A, Interview)

Due to these regulations, some users of Kiosk A assumed the Kiosk belonged to the school as explained by Garry:

The [Kiosk] was set-up for the school but the school allowed the community to use it so people from the community in this area could benefit from it including myself…

(Garry, 16, in-school boy, Kiosk A, interview)
In terms of its functionality, the data shows that Kiosk A had been working until August 2017 and was promptly repaired during this period as described by Ms. Jessica, suggesting that was why it was functional for nearly two years.

… we had the [Kiosk] until August 2017, for almost two years when it was working. […] There were times when it had phases when it’s not working, they were three to four times for a week and there was one time when it took two weeks. but they [Helping Hands] always came and maintained it.

(Ms. Jessica, teacher, Kiosk A, Interview)

The detailed description of Kiosk A in this sub-section provides the reader with an insight into the context. The Kiosk organisation's discussion shows how the community took ownership, particularly the school and the committee, which was later created. The annotated timeline presented on the next page shows key events at Kiosk A and an overview of participants in relation to this PhD research.
Figure 5.4: Annotated Timeline for Kiosk A

Kiosk caretaking role (until Dec 2017)
Ms Jane
Ms Elaine
Nelson- Helping Hands

Computers become non-functional but WiFi is working

Committee formed
Preliminary research WiFi working

Main study WiFi non-functional

Kiosk A Establishment

Oct 2015

2016

Participants’ commencement of use
George- 16, in-school
Matthew- 13, in-school
Gift- 15, in-school
Fuad- 16, out-of-school
Ross- 15, out-of-school
Suleiman, 16- out-of-school
Ms Elaine- Teacher
Ms Jane- Teacher
Ms Jessica- Teacher
Jerry- Adult
Larry- Adult

Participants, commencement of use
Jonah- 17, in-school
Garry- 16, in-school
Shaheen- 16, in-school
Patricia- 13, in-school
Gail- 11, in-school
Liam- 14, in-school
Anisa- 12, in-school
Derrick- 15, in-school
Santra- 12, out-of-school
Florence- 12, in-school
Salma- 13, out-of-school
Rania- 12, in-school
Kelly- 11, in-school
Jason- Adult

Aug 2017
Dec 2017
Jan 2018
May-July 2018
5.1.2. Kiosk B

Kiosk B was built opposite a local market which was at the centre of the local town which was about three miles from Hillside school. The settlement where Kiosk B was located had one primary school (Sunshine school) where some of the young people who were users of Kiosk B attended. Young people who were enrolled in secondary school attended Greenville school. The images below show the layout of the environment where Kiosk B was located. Figure 5.5 shows a close view of Kiosk B and as seen in front of it was a market stand where the vendor sold cooked food. More market stands are seen on the opposite side across the road. This is seen more clearly in figure 5.6.

*Figure 5.5: A close view of Kiosk B*
Unlike Kiosk A, no data was available about the community taking responsibility for this Kiosk. However, according to Nelson, the Kiosk was placed near the local council’s office, which suggested that there was an assumption that the local council would assume its responsibility.

… its [Kiosk B] set up in a location near the local council’s office so it’s more of a secure space than the [Kiosks] in the west…

(Nelson, Helping Hands representative, Interview)

However, the data shows this was actually not the case as participants reported the lack of security and management as the key issues that hindered this Kiosk’s functionality.

The biggest challenge is that there is no security or anyone to manage it, so you there when stuff has been stolen from [Kiosk B] wires are cut so you find that the machine can’t work even if it hasn’t really had a problem…

(Eddie, adult, Kiosk B, Interview)
As a result, this Kiosk faced consistent technical issues as one participant described the pattern of its breakdown.

… that [Kiosk] keeps on dying, at first it worked for like three months, then they [Helping Hands] repaired it but then it stopped working again and they fixed it. That happened many times until 2017 when they did not fix it again.

(Jack, 13, in-school boy, Kiosk B, Interview)

The data presented in this sub-section provides the reader with a detailed overview of Kiosk B, its surroundings, and the Kiosk organisation's issues to enable an understanding of the complexities at this Kiosk. Due to the non-functionality of this Kiosk, more data on the background of Kiosk B was not available as it became impossible to access more potential participants. The annotated timeline presented below shows key events at Kiosk B and an overview of participants in relation to this PhD research.

*Figure 5.7: Annotated Timeline for Kiosk B*
5.2. An understanding of participants lives

The communities involved in this study faced several challenges similar to those outlined earlier (see section 1.4). Poverty was a key challenge, and many families could not afford three meals a day as outlined by Ms. Elaine, a teacher at Hillside school who described the challenges children face.

…they [children] come from home when they are hungry you find you are seated in class teaching, a child is not picking what you’re teaching; ‘when you ask him or her what is the problem?’ he answers, ‘I am feeling hungry’… so you teach her on an empty stomach, hungry. That means she will not understand what you are teaching him or her…

(Ms. Elaine, teacher, Interview)

As a result, the extreme poverty, absence of educational materials in local schools and the constraints parents faced in affording school fees and learning materials for their children contributed to the poor educational outcomes as illustrated by Ms. Jane, another teacher at Hillside school.

Lack of enough textbooks, so if you have one book, it’s difficult to display to children. Secondly, the main challenge we get as a school is majority of the kids come from… poor families, they lack resources, you come in class, and they are lacking books and inform us that mummy said that she doesn’t have money… Even another thing is payment of school fees, although we pay little amount. So, the kid sits at home because of the school fees; when he comes, he has missed a lot. So that’s a big challenge when we are teaching. As a teacher, this challenges us to reach our goal.

(Ms. Jane, teacher, Interview)

To assist their parents/carers in earning money for schooling, some young people who participated in this study, particularly boys, indicated working on weekends and school holidays as described by Mark, a 13-year-old.

…during the weekend and holidays, I work because I have to find money for my school fees.

(Mark, 13, in-school boy, Interview)

These communities mainly depended on informal jobs such as porters, bricklaying, painters, cleaners, farming, hairdressers, market vendors and a few individuals owned small businesses. Public services were also underdeveloped; for example, consistent electricity outages existed whilst I was in the field. The roads were also underdeveloped; most were marram, and a lack of safe clean water forced the communities to collect untreated water from a pond, as illustrated below.
These communities also faced similar challenges to other urban low-income communities in Sub-Saharan Africa encounter as highlighted in the literature (see section 1.4). Youth unemployment was rampant, and some participants noted that this forced some people within these communities to engage in criminal activities.

… most of the youth in our society cannot find jobs and because of that we have a lot of theft problems and robbery in the society…

(Jason, adult, Kiosk B, Interview)

The deprivation also led to some individuals in the communities engaging in unhealthy behaviours such as drug and alcohol use to distract them from their realities.

There are people in our community who use drugs and alcohol to forget their problems…

(Steve, Hillside school representative, Interview)

The findings presented in subsequent chapters show how these prevailing challenges interplayed in the existence of the Kiosks.
5.3. Summary

The data presented in this chapter provided the reader with a description of the processes involved in setting up the Kiosks. Although there was some community engagement, the findings show gaps existed in this process both at an organisational level, and community level as sufficient information about the project were not shared in the initial discussions with Helping Hands and the communities involved. Despite these gaps, the data from Kiosk A shows that the community was actively engaged in negotiating the Kiosk's location and building it. However, the same could not be reported at Kiosk B as the data shows the project was not integrated into this specific community.

As a result, the data shows a difference in community ownership at the two Kiosks. While Hillside school assumed responsibility for Kiosk A and a committee was later created to oversee the Kiosk, there was no evidence of any management at Kiosk B. Participants indicated that it was because of the absence of leadership at Kiosk B that led to the consistent breakdowns the Kiosk faced.

Finally, the chapter provided a detailed narrative of each Kiosk and its features, and a description of the prevalent challenges present in the specific communities where the Kiosks were established. The data presented in subsequent chapters will show how these existing challenges emerged at the Kiosks. The next chapter discusses the contextual factors that influenced access and utilisation of the Kiosks.
Chapter 6: Understanding Access and Utilisation

This chapter addresses the first research question: What contextual factors influence access and utilisation of the Kiosks at the two sites in Uganda? The chapter takes Lave's (1988) view, which foregrounds the importance of understanding the broader social and cultural system. Two main themes encompassing enablers and barriers to accessing and using the Kiosks emerged from the analysis. The enablers are elements that facilitated usage of the Kiosks, and barriers are complex existing issues within the low-income communities that were exacerbated by the Kiosks. The data on enablers and barriers are presented together to demonstrate their interlinkages while indicating how the context's social and cultural structures influenced access and utilisation of the Kiosks. The chapter commences with a presentation of the findings on enablers and barriers in section 6.1, and 6.2 respectively. This is followed by a discussion of the data in relation to the literature highlighting how the findings in this chapter move the literature forward.

6.1. Enablers and Barriers to Access and Utilisation

The analysis indicated facets that supported users and other elements that limited users from accessing and utilising the Kiosks. This section commences with a presentation of the structural complexities within the context to demonstrate how gender, age and power dynamics influenced access and utilisation of the Kiosks. This is followed by data on safety and operational aspects that played a key role in determining usage of the Kiosks.

One aspect that Garry, the only male young person who indicated having an enabler noted that he identified specific times that Kiosk A was unoccupied, providing him with an opportunity utilise it.

My time management was not good at the beginning… So, whenever I wanted to use it [Kiosk], I had to come very early, especially on weekends when I had the chance to use it.

(Garry 16, in-school boy, Kiosk A)

However, the times that Garry referred to were quiet hours early in the morning. As a male, he had the privilege to be outside at those times and had the freedom to manage his time compared to female users who had cultural and security restrictions. Samira, an out-of-school girl, noted that female children were burdened with most of the domestic responsibilities and explained that she did not have the freedom to manage her time unlike her brother who had liberty with his time.
Because we are girls, our parents expect us to do all the housework at home. We don’t have time to go to that [Kiosk]. But my brother he can go there any time because he does not have work at home.

(Samira, 13, out-of-school girl, FGD)

Other females also specified their time was constrained by the numerous domestic responsibilities that took a large amount of their time, leaving them with limited time to utilise the Kiosks.

At home I normally have a lot of housework so I don’t have enough time and by the time I finish all the work, it is late, and I cannot go there…

(Gift, 15, in-school girl, Kiosk A, Interview)

I don’t normally use the computer because I have much work at home… I have to do the domestic work, wash utensils, mop the house and take care of everything at home.

(Patricia, 13, in-school girl, Kiosk A, FGD)

Although young males had more flexibility to use the Kiosks compared to female users, some young males noted that the prolonged duration they spent at the Kiosks became a problem as they neglected their other commitments. Due to this, tension emerged between them and their parents since they did not participate in domestic responsibilities.

…since I started using this [Kiosk], I’ve been getting some fights with my parents because when I started using the [Kiosk] I was always interested in being here and sometimes I wouldn’t help my parents with house chores. So, they would always get angry when I wouldn’t help with the house chores.

(Jonah, 17, in-school boy, Kiosk A, Interview)

Jonah’s point was reflected in one parent’s statement who expressed concerns about the extended durations their children spent using the Kiosks and, as a result, neglected other responsibilities.

I think it would have been better if you get time for counselling those children, not mine only but the youth who attend the [Kiosk] on the importance of being hardworking at home by having time for domestic work… They are always on that [Kiosk]…

(George’s mum, Kiosk A, Interview)

This finding suggests that although both boys and girls were expected to do domestic chores, parents were lenient with boys and let them off easily than girls, who were required to carry out a large share of the domestic responsibilities and expected to stay at home. The data presented above shows that gender dynamics and restrictions within the social and cultural context played a crucial role in determining the access and usage of different user groups. As illustrated above, boys had freedom with their time enabling
them to access the Kiosks more flexibly than girls who had significant domestic chores occupying most of their time and parental restrictions, which were barriers to them using the Kiosks.

Another aspect that a few adult male users identified as an enabler was the ownership of a device that enhances access to and usage of the Kiosk. Larry, an adult user at Kiosk A, stated the WiFi provided him with convenience as he could take his time understanding and assessing information on his device, which he would not be able to do on the shared computers at the Kiosks.

> I was more comfortable using the WiFi than computers. ...when I am carrying out my own research, it requires me to understand so maybe I pause. I write, so no problem with that when I have my own device. But when I am using the computer and I paused, the rest of the members think that I am just seated doing nothing.

(Larry, adult, Kiosk A, Interview)

However, some users pointed out that the convenience WiFi users had was because they owned personal devices and did not face the same computer access challenges most users who did not have personal devices faced.

> ...You find yourself floating one machine with so many other people since we don’t have phones to connect to WiFi, it was the challenge around.

(Eddie, adult, Kiosk B, Interview)

Kiosk A location was also identified as an enabler. For example, Jerry, another adult male user, noted that the Kiosk being within a short walking distance supported his access and utilisation.

> …because I usually come here, I bring my child here to school, it’s not far, and it’s easier for me to walk, I just walk, from here up to there, it was easy.

(Jerry, adult, Kiosk A, Interview)

Although Kiosk A’s location was considered convenient by some users, the data shows that structural facets related to age, gender, power, and social structures favoured some groups while systematically limiting other groups from accessing and utilising the Kiosk. Most young male users at Kiosk A reported multiple experiences with male adult users using physical strength to restrict their access to the Kiosk. Jonah, a young male at Kiosk A, expressed that the treatment they received from adult males had a mental strain on them, which affected their motivation to continue using the Kiosk.

> Men from the community come, push us, and remove us from the computer using force. They disturb us and we even lose that morale of coming back.

(Jonah, 17, in-school boy, Kiosk A, FGD)
The data shows that these structural barriers also affected the representative for children on the committee despite his involvement in the Kiosk’s leadership.

Those members [male adult users] they think they have more power than us and they come and chase us away from that [Kiosk] and sit on it and say, ‘the one who wants to come and sit on this [Kiosk] first fight me’.

(George, 16, in-school boy, Kiosk A, Interview)

As George did not have the authority to overpower male adults, he reported the challenges they faced as young males to the adult committee members. However, the data suggests that no measure was established to address the issue.

…I spoke with the committee members about the challenges we are facing, they said they will decide.

(George, 16, in-school boy, Kiosk A, FGD)

The data also suggests that there was no cohesion within the committee itself. For example, George pointed out the community representative who was supposed to assist in managing the behaviour of adult male users abused the authority given to him by limiting young users from utilising the Kiosk. George specifically described his own experience facing confrontation with the community representative.

You mean [Jason], he is very stubborn. When he is using it and you come and use it with him and he is on WhatsApp with his friends and if you comment, he slaps you and tells you why you are talking when I am talking. If you tell him, don’t beat me, he tells you, you will not come back here from this moment, and he sends you away. He chased me from using that computer for one month.

(George, 16, in-school boy, Kiosk A, FGD)

The findings presented in the previous chapter (see subsection 5.1.1) indicated that the committee members had only met once, and no procedures for how the committee would run were established. This suggests that the committee was not as functional as it should be in practice. Furthermore, no reporting mechanism existed as described by Liam, who pointed that adult users undermined the young person’s leadership.

Even though someone is the leader, they [adult male users] don’t mind they will just beat us, and we have nowhere to report.

(Liam, 16, in-school boy, Kiosk A, FGD)

The data also shows a problem existed with the timetable created for different user groups to access Kiosk A as young males who were not students at Hillside school were allocated the same time as adult
males. Due to this allocation, young males felt the timetable was a barrier as it subjected them to facing harm from adult male users.

…the problem is they gave us the same time to use the [Kiosk] as these older men so when they find us using, they chase us away so they can use.

(Liam, 16, in-school boy, Kiosk A, Interview)

The data also indicates that the situation was similar for young people at Kiosk B, who pointed out that they faced physical violence if they did not comply with adult males’ demands.

…but when they [male adult users] find you using [the Kiosk], they tell you to move away, if you refuse, they push you away and can beat you when you become stubborn.

(Jack, 13, in-school boy, Kiosk B, Interview)

Some young males at Kiosk B expressed that adult male users used strength to limit them because no one was present to provide them with protection.

…but there are some big men who come on it and they don’t want to move off from it and they want to use it the whole day and if they find us, they remove us. For them they beat us because there is no security…

(Irving, 12, in-school boy, Kiosk B, Interview)

The data from Kiosk B also shows that adult males tended to dominate the Kiosk and young people expressed that it was tough for them to have an opportunity to utilise it. Due to this, very few females accessed it.

…it is very difficult to get a chance to use it because of those men who sit there all the time.

(Caroline, 14, in-school girl, Kiosk B, Interview)

However, the data also shows it was not just male adults who limited other users from accessing Kiosk A as younger boys reported older boys used physical strength to restrict them from using the Kiosk.

Those big boys, they come they carry us away and throw us from the computer. If we refuse and come back, they get sticks and beat us.

(Kelly, 11, in-school boy, Kiosk A, FGD)

Likewise, female users at Kiosk A reported experiencing the same challenge with boys indicating that they did not have an opportunity to use the Kiosk if there was no adult present to facilitate their access.

…but when we go there [pointing towards the Kiosk] and there is no older person to help us, the boys don’t allow us to use it. They push us away. That’s the problem that we find.

(Patricia, 13, in-school girl, Kiosk A, FGD)
However, the data shows that having a dedicated time for females to access Kiosk A was an enabler despite the need for an adult to guarantee their access and offer protection. Female users noted that they could use the Kiosk in their allocated time in the presence of an adult to enforce the timetable and provide them with protection.

The boys do not allow us to use, when there is no one watching us during the girls’ time, they come and push us away and tell us to go home but if there is someone then we are safe.

(Samira, 12, out-of-school girl, Kiosk A, FGD)

The data also shows some aspects within the Kiosks that hindered females from using them. Females who lived near Kiosk B pointed out that they did not engage with the Kiosk because they did not feel safe due to the Kiosk being dominated by men. For example, Sara, who had tried to use the Kiosk, stated:

I don’t feel safe because there are always a lot of men. If they had put it in a school like the [Kiosk A] up there, then it will be better. But here you don’t know who you will meet…

(Sara, 16, in-school girl, non-user, Interview)

In alignment with Sara, many interviewed parents at Kiosk B also expressed concerns about their daughters' safety, indicating displeasure with the Kiosk due to the absence of a caretaker to ensure their daughters' protection. As a result of this, they did not approve of their daughters being in the same space with male users as it was unsafe.

I would like them [her daughters] to use it, but since boys and girls always gather there, no one is there to supervise them maybe like security… We don’t like it when they are there with no security because they can easily get bad habits when the boys are around because mostly the boys around are of older age compared to the other kids, they always use foul language around these kids…

(Caroline’s carer, Kiosk B, Interview)

On the other hand, although parents at Kiosk A had the same concerns, they were supportive of their daughters utilising the Kiosk when they were supervised.

…I am worried about my daughter meeting men who may be harmful to her at the [Kiosk], I only allow her to use it during school time when their teachers use during lessons or when I know it is girls time as one of her teachers informed me about that as I know someone is there to watch over them.

(Anisa’s mum, Kiosk A, Interview)

Some females who lived near Kiosk A indicated that the attitudes they received from some male users hindered their use of the Kiosk. For example, Shakira noted that she felt intimidated by the attitude she received from male users at the Kiosk, which affected her confidence and led her to avoid the Kiosk.
altogether. This shows that she needed support with using the Kiosk. However, since there was no available support, this hindered her from using it.

...There are these guys, how can I call them, like indiscipline guys they are always there making fun of girls who don’t know how to use it... That is why I don’t go there [to the Kiosk].

(Shakira, 15, in-school girl, non-user, Interview)

As shown above, the lack of ICT skills was a barrier that limited some young people from using the Kiosks. For example, in the case of Anisa, a student at Hillside school, she indicated that she only engaged with the Kiosk when her teachers took the class to research at the Kiosk or when she had a friend to help her navigate the computer. This shows that the lack of ICT support with using the Kiosks was a considerable barrier, particularly for girls.

I don’t know how to use it properly. I use it when the teacher takes us there [the Kiosk] because we just follow what she is doing and other times I call my friend to come and teach me and tell me that you press here then you get this, you press here then you do this, then I carry out my research.

(Anisa, 12, in-school girl, Kiosk A, Interview)

There were also concerns about the Kiosks' security which became a limitation that affected users' engagement with them. Some users noted that the Kiosks became a target location for some people to steal other people's devices while using the WiFi.

There are some people who come pretending to use the [Kiosk] but they come to steal from those people with phones. I saw it one day; the person was using the WiFi, and someone came from behind covering his face with a cap and snatched from behind and ran away. I screamed ‘they will take your phone’ but the person was too fast.

(Irving 12, in-school boy, Kiosk B)

It was evident that the security concerns did not only exist at Kiosk B but also affected Kiosk A.

Some people take advantage of people using their phones at the [Kiosk] and steal from them. Or even when they are not using it, they come and sit close to them and steal their phones.

(George, 16, in-school boy, Kiosk A, Interview)

As presented in the previous chapter (see subsection 5.1.1), Hillside school had set regulations for people who were not students at the school to prevent the distraction of the school's normal functioning during term time. However, participants who were not students at Hillside school pointed out that these restrictions limited their Kiosk access.

During school days, we are given limited time to use. They don’t allow us to use it and they say that from
six to night is the time they gave us to be using it.

(George, 16, in-school boy, Kiosk A, Interview)

Some participants also noted that the restrictions were not only during weekdays term-time as the teachers presented, but there were also restrictions on Sundays, expressing their frustration about the limits placed by Hillside school.

On Sundays I go to use it in the morning when they are less people, but they chase us away and tell us you will come back yet we don’t make any noise for them. I come when I want to use the computer, but they want me to go they first pray then I come back later so there is also that...

(Fuad, 17, out-of-school boy, Kiosk A, Interview)

The unavailability of the resource was also another barrier that limited the usage of the Kiosks. All participants noted that the Kiosks were always preoccupied and overcrowded and as a result, this restricted their access and utilisation.

…the population at the [Kiosk], you go and find people using and then you also want to use it within the same time, you find when you won’t manage...

(Eddie, adult, Kiosk B, Interview)

…there are always so many people so you might want to search for something fast but then there are many people, so you don’t have enough time to search for what you want...

(Fuad, 17, out-of-school boy, Kiosk A, Interview)

There were also operational hindrances that limited users from utilising the Kiosks. As noted in the previous chapter, provision of user passwords was introduced by Skills to Survive and Helping Hands in the beginning of the project as a registration mechanism, however, some participants at Kiosk A noted that these user passwords hindered other users from accessing the Kiosk.

…there are also times when some people put passwords, I come on it to use it but do not know the password and it takes a month when the password is still there until the person who put it comes and removes it, that’s the problem we face...

(Ross, 15, out-of-school boy, Kiosk A, Interview)

Teachers at Hillside school also noted facing the same limitation indicating that:

…and we realised that a certain group of people were able to access [Kiosk] in the evening and when they finished, they locked it with the password. So, we were not able to access it during the day.

(Ms. Elaine, teacher, Kiosk A, FGD)

Ms Jane, another teacher, noted that she reckoned that the group who used passwords were those who
were trained on how to set up the user passwords at the beginning of the project.

But I’m suspecting the ones who started when the [Kiosk] was brought were the ones who were using passwords because they [Skills to Survive and Helping Hands] showed us.

(Ms. Jane, teacher, Kiosk A, FGD)

Although there was no data on using passwords at Kiosk B, participants raised a more significant problem of the Kiosk having consistent technical challenges that lasted for prolonged durations limiting its usage.

It works for like a month or two, then it gets spoilt. I think it got spoilt six to seven times in the two years. Because of this, I was not able to use it as much as I would like.

(Irving 12, in-school boy, Kiosk B, Interview)

Since Kiosk B was only three miles away from Kiosk A, Kiosk A participants were aware of the consistent technical challenges the Kiosk faced. Due to this, some participants moved to use Kiosk A. Learning from the technical problems at Kiosk B, Ms Jane, who had been managing Kiosk A, put restrictions on access to the computers’ central processing unit to mitigate facing the same technical hindrances.

But we got a big challenge, everybody could come and touch in it [the Kiosk], that’s why I put a padlock on it for the safety [she put a padlock on the central processing unit]. That’s why those people at [Kiosk B] are facing a lot of challenge, because of people’s hands...

(Ms. Jane, teacher, Kiosk A, Interview)

Finally, the quality of connectivity and operational capability of the computers was also raised as an issue that limited usage at Kiosk A.

…I come there early in the morning when there is no any people and I start using but when I start using that computer, it switches its own self off.

(Kelly, 11, in-school boy, Kiosk A, Interview)

The evidence presented in this section has provided an insight to understanding the different aspects that enabled access and utilisation of the Kiosks and the diverse complexities that restricted users particularly young people from accessing and utilising the Kiosks.

The findings presented in this section demonstrated complexities within the context that influenced access and utilisation. The data shows that gender played a crucial role in determining access as males
had more flexibility to access the Kiosks than females who were restricted by social and cultural norms that expected them to stay at home and contribute to a large share of the domestic responsibilities. However, the data shows that due to the Kiosks being dominated by men who prevented young people, many parents were hesitant about their daughters using the Kiosks as they had safety concerns. Nevertheless, Kiosk A data shows the female only time was an enabler for female use. Both girls and their parents felt comfortable during this time, especially when supervision was available. The data also shows the location of the Kiosks played a vital role in determining who accessed them and how they were accessed. Finally, the operational challenges the Kiosks faced were identified as a barrier which hindered usage of the Kiosks particularly Kiosk B, which had consistent breakdowns. These findings are discussed in detail below.

6.2. Discussion

The findings presented in this chapter illustrate how gender, age, power, and social structures complexities were crucial in shaping how the Kiosks were used and who used them. Understanding these complexities identified the enablers and barriers that influenced access and utilisation of the Kiosks. The data presented demonstrates that the gender dynamics within the social and cultural context systematically favoured males and hindered females from using the Kiosks. The data shows that due to the social and cultural norms that expected women and girls to stay at home and boys and men to participate freely in the community, males in these urban low-income communities were more flexible to access the Kiosks since they did not have restrictions with their time. For example, a few male users at Kiosk A indicated that they had identified specific times when the Kiosk was unoccupied. However, given that these particular times were quiet hours outside regular daytime hours (08:00-18:00), these times were an enabler for particularly males, who had the freedom to manage their time compared to females who experienced cultural restrictions. This links to the literature presented earlier in subsection 2.1.1 discussing the existing gender digital divide in Sub-Saharan Africa (e.g. Philbeck, 2017; Pew Research Centre, 2018; ITU, 2019), which outlines that men in low-income communities are better positioned to access and benefit from ICT than women due to the social and cultural norms within the context that supported this positioning.

Females in these urban low-income communities expressed being overstretched with domestic responsibilities that took most of their time leaving them with limited time for personal development. This finding corroborates with previous studies (such as Livingstone et al., 2017), which examined
adolescents ICT access and usage in the Global South. However, the study was a rapid review that stated girls were given more domestic duties but did not provide the context's complexities to understand the situation better. The findings in this chapter demonstrate that the situation was complex as both boys and girls were expected to take part in domestic responsibilities. However, parents had more expectations for girls to do a large share of the household chores, which gave them little free time and flexibility to use the Kiosks than boys who were easily let off and had freedom with their time and could use the Kiosk flexibly.

On the other hand, the data also shows that boys spending prolonged durations at the Kiosks led to them neglecting their other commitments, particularly domestic chores. This suggests that the burden of house chores was left to females contributing to the little free time to use the Kiosks girls had, demonstrating an absence of support from male counterparts and parents to support girls' usage of the Kiosks. By showing the complexity within the context, the findings in this chapter challenges studies (such as Singh, 2017), which suggests that ICT usage in females was low due to the 'leaky pipeline' phenomenon where they chose domestic responsibilities over their personal development. The findings presented above show that females did not have a choice but rather the social and cultural structures within the low-income context of this research did not support females in investing time in their personal development as they were burdened with more responsibilities at home and had less free time compared to males.

Additionally, there were concerns about girls' safety at the Kiosks as the Kiosks were associated with men who dominated them. As a result, female participants who lived near Kiosk B indicated that their lack of engagement with the Kiosk was because they did not feel safe and comfortable due to male dominance at the Kiosk. It was also evident in parents' sentiments that they disapproved of their daughters being in the same space with men due to concerns about their safety. Women and girls sharing spaces with unfamiliar men did not conform with the social and cultural norms of the low-income communities in this research context as it was considered unsafe for them. However, the data shows that women and girls engaged with the Kiosks when provided with a dedicated female-only time. For example, in the case of Kiosk A, both girls and parents indicated that having this female-only time and someone to ensure their access was an enabling aspect that facilitated female engagement with the Kiosk. The findings also show that this female-only time with supervision encouraged parents at Kiosk A to support their daughters' usage of the Kiosks as they felt their daughters were safe during this allocated time. It was also evident in the girls' quotes that they were more comfortable in their allotted time when they had a
supervisor. These findings suggest that the location and organisation at the Community Technology Centres (CTCs) played a crucial role in determining whether women and girls engage with it or not and expands on previous studies cited in the literature (such as Gcora et al., 2015; Lwoga and Chigona, 2019) that examined women's engagement with CTCs. The findings in this chapter demonstrate how a measure in place can enable or hinder female engagement with CTCs.

Another related aspect that limited female users from utilising the Kiosks were the discriminatory experiences encountered at the Kiosks, which undermined their efforts and affected their confidence which led them to avoid it. Studies (such as Singh, 2017; Singh et al., 2018) suggested that female ICT usage in low-income contexts in the Global South was hindered by psychological barriers such as the lack of confidence from using ICT. However, the findings presented in this chapter show that the absence of supportive environments to nurture confidence development led to low female engagement with the Kiosks.

Although Kiosk A's location was identified as an enabler for some users as it was convenient and within a short walking distance, the data shows that despite the female-specific barriers discussed above, other structural aspects within the context systematically favoured some groups. As a result, it became a significant limiting factor to their access and utilisation of the Kiosk. Young males reported that adult males used physical strength to hinder them from using Kiosk A. As a result, this affected young males' motivation to continue using the Kiosk. Although a timetable for different user groups to use the Kiosk was developed, the data shows it was a barrier for young males who were not students at Hillside school since they were allocated the same time as adult male users. This subjected them to experiencing harm from adult users. Besides, young males at Kiosk A reported that the selected community representative on the committee whose role was supposed to ensure adult males used the Kiosk in harmony with other users instead prevented young people's access to the Kiosk. Although these problems that young males experienced were raised with the committee, the data shows no action was implemented to address the issue. Additionally, no reporting mechanisms to manage adult male behaviour existed. This suggests that although a committee to oversee Kiosk A was in place as presented in the previous chapter, it did not work in practice since there were no clear guidelines that committee members followed since they only met once after its establishment.
On the other hand, younger boys and female users at Kiosk A reported older boys used physical strength to hinder them from accessing the Kiosk. Likewise, at Kiosk B, adult males hindered young people from accessing the Kiosk in the same way as at Kiosk A. However, the data shows that due to the absence of an organisational structure at Kiosk B, it became a gendered space dominated by adult males. These findings highlight that the existing power gender hierarchies within the communities played a crucial role in determining the Kiosks' access and utilisation. Previous studies (such as Gomez, 2014; Gcora et al., 2015; Abiodun et al., 2017; Lwoga and Chigona, 2019) that examined gender aspects in CTCs found similar results. In addition, this PhD study found that the lack of ICT skills limited a few users particularly girls from using the Kiosks. The findings in this chapter contribute to this discussion by demonstrating that other aspects such as age, knowledge, and skills to use ICT can play a role in determining access and utilisation of CTCs. The results presented above have shown how the complex social and cultural structures within the low-income communities of this research influenced who accessed the Kiosks and how they were accessed.

Another reported aspect that limited users' access was the unavailability of the Kiosks. Participants noted that Kiosks were always overcrowded, thereby limiting their usage. Studies (such as Kapondera and Namusanya, 2017) found similar results. This finding suggests that one Kiosk with only two computers was not enough to cater for the large population that used them. In linking this to the earlier discussion on structural barriers, this finding indicates the resource constraint contributed to why those barriers existed.

Some users at Kiosk A also pointed out that Hillside school's access restriction for users who were not students at the school limited their access and utilisation. This chapter's data shows that Kiosk A being in a school setting worked better than Kiosk B, which was in a public space. However, as shown in figure 5.1, Kiosk A was close to classrooms that did not have any windows, suggesting that the noise from the Kiosk could be heard in the classrooms, thereby interfering with the regular school functioning.

Finally, operational hindrances limited users from utilising the Kiosks. At Kiosk A, the user passwords provided during the implementation of the project (see section 5.1) and poor operational capability of the computers became a limitation that hindered other users from accessing the Kiosk. On the other hand, Kiosk B's consistent breakdowns that lasted for prolonged periods became a significant limiting factor that impeded usage. However, owning a device was considered an enabling factor for the few users who
had personal devices, thereby providing them with convenience to use the Kiosk via the available WiFi. Still, since most Kiosks users did not own personal devices, they could not benefit from the WiFi. The factors that contributed to these operational barriers that hindered the Kiosks’ functioning will be further explored in chapter eight.

In conclusion, the evidence presented in this chapter demonstrates that the social structures played an essential role in determining how CTCs, in this case, the Kiosks, were accessed and utilised and who used them. As outlined in the literature (see section 1.5), CTCs are promoted as an approach to bridge the digital divide in low-income communities. However, the evidence presented in this chapter reveals that this cannot be achieved without thoroughly understanding the social and cultural setting of the context where the CTC is established. This is evident in the overall barriers young people faced and, more specifically, the various obstacles that limited females from utilising the Kiosks. These findings suggest a need to comprehensively understand the social and cultural setting and the requirements of different user groups through a collaborative process with the intended communities throughout the project lifecycle to embed practical measures within the project that will promote equitable utilisation. Suggestions on how a collaborative approach with low-income communities is applied to develop practical context-specific strategies to address the complexities within this context to improve access and usage of the Kiosks will be discussed in chapter eight. These suggestions will also apply to CTCs in similar low-income communities in Sub-Saharan Africa.

6.3. Summary

In summary, this chapter provided a detailed narrative of the aspects that enabled access and utilisation of the Kiosks and complexities related to gender, age, power, and social structures that played a crucial role in restricting users from using the Kiosks. Young people particularly noted adult males prevented them from using the Kiosks. The data also demonstrated how the social and cultural constraints women and girls faced within the low-income communities of this PhD research influenced their utilisation of the Kiosks. These findings highlight the need to understand limitations within a context that could hinder women and girls access to CTCs. The data presented in this chapter also highlights that the location and resource availability were crucial to influencing how the Kiosks were accessed, suggesting that having one Kiosk to serve the large population it catered for was insufficient to achieve equitable access. These findings have a significant implication on understanding how the social and cultural systems determine
how CTCs are accessed and who accesses them. The next chapter explores the perceived impacts of the Kiosks for the reader to understand the significance of the enablers and barriers discussed in this chapter.
Chapter 7: Perceptions of Impact: Opportunities and Limitations

This chapter focuses on the second research question: What are the perceptions of impact of the Kiosks on users (young people and adults) at the two sites in Uganda? By drawing on Lave's (1988) view, the chapter identifies how the Kiosks were conceived as a tool to understand the meanings assigned to them and how they were used to facilitate tasks relevant to users. Doing so identifies the impacts of the Kiosks on different user groups, encompassing opportunities and threats which are discussed below. As outlined in section 1.7, the definition of impact applied in this PhD is “a change in people’s lives. This might include changes in knowledge, skills, behaviour, health or living conditions for children, adults, families or communities” (UNDP, 2011, p.7). This chapter provides a detailed description of the opportunities that were created as a result of the Kiosks and how these opportunities brought changes in participants’ lives. The chapter also explores the limitations that emerged due to the existence of the Kiosks. Two main themes emerged from the thematic analysis encompassing opportunities and limitations. The theme of opportunities had two sub-themes comprising of learning opportunity and influence on the quality of life.

In section 7.1, three cases are presented to provide the reader with a detailed description that exemplifies the themes that emerged for research question two. Sections 7.2 presents data on opportunities and its sub-themes and associated codes, and section 7.3 presents data on the limitations that emerged as a result of the Kiosks existence. Finally, 7.4 discusses these findings in relation to the literature in chapter two and highlights how the findings in this chapter move the discussion in the literature forward.

7.1. Case Examples

The purpose of these case examples is to provide a detailed description of three cases (two young people from Kiosk A and one adult from Kiosk B) to exemplify the themes that emerged from the data for this research question presented in the coming sections. These three case examples are not intended to represent all cases but were selected to provide the reader with a rich picture of individual stories to demonstrate how the Kiosks supported users in accomplishing tasks that were important to them. The case examples also illustrate the identified limitations of the Kiosks and aim to facilitate understanding of the themes that emerged for this research question from a range of data sources, i.e., interviews, focus groups and field notes for the reader.
7.1.1. Case: Garry

The data presented below is based on an individual interview with Garry, interview notes, an interview with Garry’s carer and an interview with Garry’s teacher.

Garry was 16 years old in his third year of secondary education and lived with his aunt and two cousins. He moved from the village to the urban low-income community where Kiosk A was placed in 2016 to join a better school. His aunt acquired a well-wisher who assisted with paying Garry’s school fees through a friend who was a teacher at Hillside school. His mum and siblings still lived in the village, and he went to visit them during the school holidays.

Garry described that Kiosk A became his first opportunity to interact with a computer enabling him to develop computer literacy through peers’ assistance.

Since 2016 when I moved here, I found the [Kiosk] and I didn’t know how to use the computer, but I found people who could help to show me how to use the [Kiosk]. [George] was one of the people who helped me… I was not good in technology, it helped me learn how to start and shut down a computer. I didn’t know how to use a computer at all. I learnt how to use a keyboard and it helped me to improve my typing speed when I learnt how to type.

After developing his computer literacy, Garry noted he shared the knowledge he had gained with peers.

…When I learnt how to use the computer, I used to help other people so they could learn too.

According to Garry, the Kiosk became a place to research his school topics, highlighting that it helped him bridge the gaps between what was taught and examined.

It has also helped me with increasing my knowledge of my school subjects, I have been able to expand my knowledge on various subjects. Instead of having to wait for the teacher to tell me everything in my school subjects, I did my research and shared what I found out with my teachers and classmates. Many times, the term ends when we have not finished the syllabus and yet in the exams everything that was supposed to be covered during the term will be brought. So, the [Kiosk] has helped me to be ahead with my research and even when we have not been taught something, but it is part of the syllabus for the term, I used to do research on it.

Garry noted that the Kiosk specifically supported him in understanding topics in various school subjects describing the exact content. In Chemistry, he stated:

…I learnt how to balance chemical equations through watching YouTube videos on balancing equations. In organic chemistry, I learnt how to draw Lewis structures, bond line structures and skeletal structures. I also learnt and understood how to draw Lewis structures of functional groups like alkanes, alkenes, and alkynes. I also learnt how to draw the electron configuration diagram correctly.
It was also evident in his teacher’s sentiment that the Kiosk supported Garry to understand Chemistry, as his teacher noted this translated into his performance in class.

…he told me he was doing research at a computer placed at [Hillside school]. He has improved in Chemistry especially with the topic of balancing [chemical] equations which he was not getting when I had started to teach. You know Chemistry normally disturbs students. But he told me he was watching videos to teach him on that computer.

(Mr. Williams, Chemistry teacher, Interview)

A second subject where Garry explained specific content that the Kiosk supported him to understand was Mathematics.

Another subject is mathematics statistics, I watched videos that helped me learn how to find the class boundary, cumulative distribution function, probability density function, linear regression, multiple regression, variance, and standard deviation of data sets. Because statistics is a simple topic but very confusing so when I watched those videos on YouTube, it simplified things for me.

He also outlined other topics in History and Geography that he researched at the Kiosk, indicating:

In history the topic is called ‘Ngoni migration’; ‘Nyamwezi’; ‘the history of Maasai’. […] Another subject is Geography, I learnt definitions that we learnt in class. So, I learnt how to answer questions and to explain. An example is you can be told to define ‘fieldwork’ and you have to explain from the beginning ‘what is fieldwork?’ so you explain that fieldwork is the study that is taken outside the classroom. Then you explain the procedures of fieldwork and locating where the fieldwork will be done.

It was also apparent that Garry’s carer felt the Kiosk supported him to understand his school topics.

To me that computer has made a difference to our children, you know they don’t teach them everything in school, but the teachers expect them to know because they bring it in their exams. So that computer has really helped [Garry] and even my children to be able to learn those topics in their school subjects that disturb them.

(Garry’s carer, Interview)

Garry noted that the Kiosk became a social space that provided him with the opportunity to nurture a sense of belonging when he moved into the community.

I had just moved here when the [Kiosk] was built. So, I was still new and through the [Kiosk] I made new friends. So, the [Kiosk] helped me to make new friends and to fit in, in this community.

From Garry’s account, the Kiosk provided him with the opportunity to develop leadership skills as he supported peers and volunteered to clean the Kiosk.

I helped many people by showing them how to use the [Kiosk]… Some were like me they used to come and do research for their schoolwork. […] I became a leader to guide and control the youth who are in the
same age range as me and I used to clean the [Kiosk] too… I am not part of the committee, but I just realised that it was very dusty. So, I just started cleaning the [Kiosk] twice a month.

He, however, indicated that a limitation experienced at the Kiosk was that some users left pornographic content on the screens, which brought negative consequences as children were exposed to pornography.

Some people go at night and start watching pornographic movies and stay there all night and they forgot to remove those videos and pictures. There was a time children found those bad scenes on the computer one morning.

As noted in the previous chapter, Garry had identified in the beginning specific times outside regular daytime hours (08:00-18:00) to use the Kiosk when the computers were unoccupied. However, as Garry progressed to use the Kiosk, he found it challenging with the resource unavailability (discussed in the previous chapter) as it restricted how often he could use the Kiosk. This experience motivated him to save up and purchase a smartphone so he could instead utilise the WiFi which he suggests was more flexible.

…most times I found many people using it. But that did not stop me, I used to stay there until I get a chance to do something on the screen. But through doing some casual works, I saved some money for months and bought a smart phone in 2017. […] But having the WiFi helped.

Garry also indicated the Kiosk equipped him with problem-solving skills enabling him to use the knowledge he gained to address specific situations. He specifically described learning how to repair his phone, which protected him from taking it to a technician as he could not afford.

…there was a time this phone broke down and if I hadn’t searched online for ways of how to repair it, then I would take it to a technician who would demand a lot of money. Through my search on the computer, I found how to repair a smartphone like mine, and it guided me on how to make simple electrical repairs. For example, when wires of a bulb stop working when it has not blown or just bulb wires not responding. …you see this phone that I have, there was a time the headphone jack was not responding. So, what I did was to do research on how I could repair since I couldn’t afford to take to a technician. I read some materials and watched some videos on how to repair the problem. After understanding what I was supposed to do, I opened the phone, and I was able to fix the wires that were loose.
7.1.2. Case: Gift

The data presented below is based on a focus group interview in which Gift participated, an individual interview with Gift, interview notes, an interview with Gift’s mum and an interview with her tuition teacher.

Gift was 15 years old in her third year of secondary education and lived with her mother and two sisters, who were younger than her, approximately a half a mile from the Kiosk.

Gift indicated that the Kiosk provided her with an opportunity to develop computer literacy.

…I am learning how to use a computer, which I never knew, I learnt how to use Microsoft word, excel, and PowerPoint and also how to browse and search for things on the internet.

Gift also pointed out that the Kiosk supported her in addressing the school holiday assignments she was given through identifying specific websites for her research.

…they [her teachers] used to pack for us like holiday work and I come and research on the computer, I go on google search for BBC bitesize and Khan Academy, then I search for what I want on those sites, and I get what I want it comes.

Further, she explained how it supported her in understanding Chemistry topics that she was interested in learning more about.

Me I wanted to learn and understand paper chromatography, the method of separating ink on paper, I read on the topic separating mixtures on BBC bitesize and watched some videos on Khan Academy on this topic, the videos simplified things for me because I understood things better than in class. Another topic is titration, I learnt about the four steps in titration to get correct results and learnt why the pipette is used to measure acid than a measuring cylinder, this is because it allows the same amount of acid to be added each time. I did my research on BBC bitesize and Khan Academy.

When asked whether she shared what she learnt at the Kiosk with her teachers, Gift said:

What I found helped me to understand the topics in my school subjects and answer the questions the teachers asked me and got them correctly. I did not tell my schoolteachers where I was getting more information from, but I told my tuition teacher who teaches me chemistry. I also shared with my friends what I found.

It was common for curriculum content not to be completed within the term due to teachers being overstretched and the educational resource constraints experienced in the low-income communities of this research. Due to these challenges, some children attended holiday tuition to support their learning. Gift was among the young people who attended holiday tuition, and her tuition teacher specified how the Kiosk supported Gift in her learning as follows:
[Gift] has been doing lots of research at the [Kiosk], I tutor her in Chemistry with other students during holidays and she came and explained concepts of titration to other students when we were learning about it.

(Ms. Emily, Chemistry tutor, Interview)

Gift also noted the Kiosk supported her in Mathematics, where she learnt easier ways of solving simultaneous equations.

In mathematics solving the simultaneous equations, I learnt how I can solve simultaneous equations using the different methods; you can use substitution, elimination, graphing method, or a joint method. I watched videos on YouTube and on Khan Academy and that is how I understood how I can apply the different methods in a simpler form than what the teacher explained.

Her mum also explained how she believed the Kiosk supported Gift in understanding simultaneous equations.

Gift was struggling with simultaneous equations before this [the Kiosk], as she would get confused with some of the methods, but after she watched the videos on Khan Academy and YouTube, she started telling me, ‘mum I’m now understanding how to do them’… the [Kiosk] helped her understand.

(Gift’s mum, Interview)

She expressed that the content she understood at the Kiosk stuck with her because she tried to learn independently.

I never knew and understood some things, then when I get it there, it cannot even move in my head because I am the one who researched for it, and I took my time…

The Kiosk also supported Gift to develop problem-solving skills enabling her to address the practical challenges she encountered.

As me, that [Kiosk] has helped me to find solutions to problems. My mother sent me to buy salt, and, on that day, it poured in the soil. I wondered how I can get back the salt because I knew we could not afford to buy it again. I went to the [Kiosk] and researched how can I recover the salt on BBC bitesize. I learnt that I get the mixture and put it in a pan, I add water and mix until the salt dissolves into the water. Then I filter and the soil remains in the filter paper. Then I cook the water, I boil up to the extent the water will move away and vapour forms and only the salt remains in the pan. So that is how I recovered the salt.

The Kiosk also played a role in facilitating communication via Facebook between Gift and her father, who lived outside Uganda.

As me my dad is not here, he is in Abu Dhabi. I use that computer to connect with him on Facebook and letting him know how we are doing.
From Gift’s account, her father could see the benefit of the Kiosk as it helped her develop her skills and be in touch with him. She stated that her father appreciated the confidence in ICT usage she had gained and considered buying her a phone.

…he [her father] realised I can use a computer which has helped me. Now, he bought me a phone which has helped me to communicate anywhere…

Finally, Gift believed the Kiosk brought her enjoyment indicating:

I used it for playing games and when I got a phone, I used the WiFi to download games on my phone…

7.1.3. Case: Eddie

The data presented below is based on the interview with Eddie, a community adult user.

Eddie was a 26-year-old community user at Kiosk B who commenced using it in 2015, just after it was built. He noted he was working at a trading centre opposite Kiosk B at the time it was constructed. When this interview was conducted, Eddie owned a photography studio about a mile from the Kiosk.

Eddie discussed that he was interested in starting his own business but did not know where to begin indicating that the Kiosk provided him with entrepreneurial information that helped him establish a small-scale business.

…by the time that machine [Kiosk A] was built there, I was still working for my boss… I used to come on it to research about small scale business. …For me I didn’t have the courage to open up a business and I thought you need a lot of capital to open up a business. But one day… I read a bit about small scale business, how to open up a small-scale business, what do I need? what do I have to know about it? and what should I focus on? …I had only 600,000 Uganda shillings [$160] but I didn’t think I was able to start up something…

He described what he learnt at the Kiosk and indicated how it enabled him to build capacity that allowed him to have the confidence to start the current business he had.

…first steps on what I read on… you have to study the area you are going to put up the business from… look at the people around that area …study their employment benefits, how are they standing. Then you get to know… the business choice you want, what people are doing or have done the business in the area, what challenges do they have or what did they fail at, after getting to know their challenges, then look for the solutions for the challenges it means you will be able to compete on the same market, you do something which is of better standard than theirs. Even if you have started a small business, you will be able to progress. After I realised that, then I… got determined to open up this business. …how to handle the customers, if a customer comes to your business, how do you speak to that person, how do you handle that person so that he can get interested to come back again. All those ones I studied them from the [Kiosk], within one to two months with learning on that computer.
Additionally, he explained how he implemented this knowledge in practice describing the steps he took to create the business.

…I did not start with photographing; it came after six months because I had no camera for the capture. I had no other things to open up a studio, I could not make it that as the money I had was not enough. So, I had to look for something I can do simple in that amount of money I am having. I bought this machine at 350,000 Uganda shillings [$95] then I had my speaker that one at home I was using.

…I came and met the landlord of this area and we negotiated he wanted me to pay three months in advance, but I could not afford… So, we negotiated that he can give me, I pay for one month it is for 150,000 Uganda shillings [$40] I start working, if I work, I pay the remaining two months. At the time I didn’t think that it can be possible that I could work and raise that money within the time we agreed. But I just believed that I can do it because I found that during my research at the [Kiosk], they gave me an example where they used Dollar but when I converted to our currency, I found that it is even less than that money I had. …I progress slowly and now it has taken me one and a half years when I am here.

Eddie’s business expanded, and at the time of this PhD research the business offered several services which included a photo studio, phone accessories shop and printing services as shown in the figures below.

**Figure 7.1: Eddie’s business: phone accessories and print shop**
Eddie also stated that he created a website where he promoted his products, noting that the Kiosk computer provided him with the convenience to upload content that he could not upload on his phone.

I used it at the time when I had just opened up website because I wanted to use it to promote my stuff, like if I have brought a new product and I go to my site, I type it in, you put it there then send to your clients if you have their contacts. According to business that’s why it was most important that when I want to promote my thing, it’s easier for me to go there because even some heavy information which I can’t use on the phone and yet on the machine it was faster.

As noted earlier, it was regular in the Ugandan formal education system for students to be examined on topics that they were not taught in the curriculum. Eddie stated that he was a college student when the Kiosk was established and indicated the Kiosk supported him to understand topics in his course work, bridging the gap between what was taught in class and what was examined.

…you know lecturers in Uganda they don’t give you everything about the topic they bring for you, they just give you some things so that you can go and look for more information beyond what he has given you. There is no other way you can do it because you consult from a person, they give you a different topic because there is someone who tells you, but they are also not sure, but they want to show you that they also know. So, the advantage becomes that when you go to Google Scholar, you find that most of the information is already there so it’s easier for you because most especially when you get a topic, and you haven’t understood…

He also pointed out the Kiosk provided him with the opportunity to teach computer skills to orphaned young people in a nearby school, noting that his experience growing up in an orphanage motivated him to give back to the community.
…when I reached where I am now, getting some success where I am now, I felt so bad, I wanted to get some other kids that I can help, I might not help them with money but at least what I’ll have taught them. Even me I didn’t go to an institute to study computer, I just learnt a little bit about it at the orphanage then the next time was when this [Kiosk] was built. I wanted to also help out some other kids to be able to reach where I am because even me if I had no chance to go to the orphanage, I don’t know how my life could be today because I didn’t know how to use these machines. The little English I know I could not get that chance, so I also wanted to do it now for those kids of [a local school]…

He described teaching young people from the local school computer skills using the computer at the Kiosk.

…I normally teach young kids stuff, how to use a computer, how to write work, how to type documents, there was also a programme that they had put for calculations so there are so many kids who were using it. I don’t remember its title, but it has been teaching mathematics like when you type in something it brings for you one plus one and it leaves for you a question mark. So, it was like a game but the more the kid uses it, mentally he learns, and it helps with faster thinking it’s what I found out…

In linking to the data on the resource constraint presented in the previous chapter, Eddie noted that the WiFi made a difference for people who owned personal devices.

…I normally teach young kids stuff, how to use a computer, how to write work, how to type documents, there was also a programme that they had put for calculations so there are so many kids who were using it. I don’t remember its title, but it has been teaching mathematics like when you type in something it brings for you one plus one and it leaves for you a question mark. So, it was like a game but the more the kid uses it, mentally he learns, and it helps with faster thinking it’s what I found out…

The biggest challenge is sometimes you go there when they have stolen stuff, wires are cut so you find that the machine can’t work even if it hasn’t really had a problem but when it can’t work…

These three case examples presented in this section have provided the reader with an insight into the themes that emerged for this research question. A common theme that occurred across the three case examples was that the Kiosks supported users to understand content in their formal learning to bridge the gaps between what was taught and what was examined. The young people's case examples demonstrate that the Kiosks specifically supported them in understanding biology, chemistry, and mathematics topics. As presented in the following section, most other young people reported the Kiosks helped them to understand these specific subjects. Another common theme that emerged in the young people's case examples is how the Kiosks supported them to develop computer skills which was another key theme across the other cases (young people), as will be seen in the next section. The young people's case examples also indicated that the Kiosk enabled them to develop problem-solving skills, another aspect that will be seen in some participants' data. These three case examples highlight that the Kiosks had
become social spaces where users shared the skills they had developed, engaged with peers, and got an opportunity to communicate online. The adult user case example demonstrates how the Kiosk supported him to obtain entrepreneurial information, which enabled him to improve the quality of his life, a theme that emerged across all adult users. Finally, an identified limitation of the Kiosk presented in one of the case examples (Garry) that emerged across most cases was that some people left pornographic content on the computer, which negatively affected children. These themes, alongside other themes that emerged for this research question, are presented in succeeding sections. The following section presents the themes that emerged for opportunities across all cases.
7.2. Opportunities

The data presented in this section illustrates how the Kiosks were used by different user groups (young people and adults) and how they created a potential for users according to their interests and abilities. Therefore, supporting them with skills that facilitated performing tasks and activities that were important to them. Users valued the Kiosks outlining, "It has helped us to nurture our talents...." (Jason, adult, Kiosk A) and described the changes that came in their life through their engagement. One out of school participant framed it as "... For me the [Kiosk] opened up a world that I would have never seen" (Suleiman 16-year-old out-of-school boy, Kiosk A). The purposes of use that were key to facilitating opportunities were different for young people and adults and depended on whether users were enrolled in school/college or not. Users who were enrolled in school/college mostly used the Kiosks to support their formal learning and users who were not enrolled in school engaged with aspects of formal education that they found relevant to their daily activities at the Kiosks and used the Kiosks to support with their everyday tasks. As presented in the data analysis chapter (see figure 4.12), the sub-themes that emerged from the analysis for the theme of opportunities were learning opportunity, and influence on the quality of life. This section commences with a presentation on data for learning opportunity followed by the findings on the influence on the quality of life.

7.2.1. Learning opportunity

This sub-section on learning opportunity explores findings on the codes that emerged for learning: understanding school subjects topics, peer learning, computer literacy, resource support, English vocabulary, information seeking, extend an interest, supporting users tasks, international awareness, current affairs, and community learning.

All young people enrolled in school (22 participants) indicated the Kiosks supported them in understanding their school subjects' topics. Most young people felt that the Kiosks helped them to understand concepts in science and mathematics disciplines. The data shows the Kiosks particularly helped them to understand topics in biology and chemistry which suggested that many young people struggled with these subjects due to the insufficient educational resources and equipment for these subjects experienced in these low-income communities.

I have been using the [Kiosk] to research about Chemistry and Biology practicals, where I get difficulties in classes I come with some notes on the paper, then I search. After I search on those notes, I write them in my book at the [Kiosk]. Then I come and understand them very well. It has helped me much to understand Biology and sometimes I go there and watch some videos on YouTube in Biology practicals…

Khadija A Mohamud          The Open University
I also use Khan Academy a lot. We search about the organs of the heart in Biology…, we choose the videos, then watch them and draw them. After we draw those organs and their purposes then we take them to the teacher…

(Shaheen, 16, in-school girl, Kiosk A, Interview)

Jacob, another participant, outlined the Kiosk assisted him to grasp concepts in Chemistry.

…I go to that page called Khan Academy… I learnt about the chemicals and if you add them, what they do, what they make and the chemicals, and in under that topic, we learnt about those gases, the carbon dioxide, oxygen.

(Jacob, 14, in-school boy Kiosk B, Interview)

Derrick, another participant, described the aspects he learnt in mathematics and highlighted the websites he used to understand them.

I learnt and understood factoring monomials, binomials, and polynomials. I watched videos of these on Khan Academy which helped me understand how numbers are factorized and the factors and multiples of a number.

(Derrick, 15, in-school boy, Kiosk A, Interview)

Most young people enrolled in school outlined that the media resources they accessed at the Kiosks provided them with a better understanding of new concepts compared to what they were taught in class.

Because on that computer we see them, but in the books, in the teacher’s notes, they don’t show them to us. They show us only their functions and words but don’t show us their pictures. So, on that computer we see their pictures, functions and get more functions than in the books [teacher’s notes].

(Shaheen, 16, in-school girl, Kiosk A, Interview)

As a result of their research at the Kiosks, many participants at Kiosk A reported having positive outcomes on their overall school performance with some particularly explaining how their grades improved.

I was not performing well like I used to get 20 to 30s like that. But after researching about it, I improved, started going to 60 to 70s there…

(George, 16, in-school boy, Kiosk A, Interview)

Shaheen, stated:

Actually, it [the Kiosk] has helped me much because I was not performing well in Biology… But now the last two terms I got a D1 [Distinction 1 ranges from 85 to 100 percent] in Biology after searching on that computer. But before I used to get F9, C5 [lower grades as per the Ugandan education grading system].

(Shaheen, 16, in-school girl, Kiosk A, Interview)
However, these participants who indicated their grades had improved outlined that the Kiosk’s non-functionality affected their school performance since they no longer had a way to engage in researching their school topics.

…I am not even performing well because last time I was performing well because the hard questions they gave me, I just went there, and I search for them and after there I revise them to get good marks. …nowadays I don’t have any way to go and get them.

(George, 16, in-school boy, Kiosk A, Interview)

Participants’ teachers also acknowledged that the Kiosks had a positive influence on students’ overall performance. Mr. Williams who taught Biology and Chemistry to participants in this study who attended Greenville secondary school corroborated with participants sentiments describing how it had a positive impact on each of them. For example, in the case of Shaheen above, he commented:

…this student also comes with work on Biology and Chemistry. …whatever she is doing has improved her performance...

(Mr. Williams, Biology and Chemistry teacher, Interview).

Participants had a general tone of contentment after accomplishing a task due to the knowledge they gained from the Kiosks, with some of them comparing their previous lack of motivation with the confidence the Kiosks facilitated.

The other time I couldn’t care about my notes but since I started using the [Kiosk], I started comparing my school notes and the information I found on the [Kiosk] and would fill the gap when I don’t have enough notes on a topic. …my interest in studying increased. I have understood matter from my schoolwork...

(Jonah, 17, in-school boy, Kiosk A, Interview)

Overall, Kiosk A data shows that the Kiosk created peer learning opportunities among young people enrolled in school. They supported each other to address a question and discussed the results, leading to a unified representation of the solution.

…when studying with other people that I don’t know. It makes me work together with other people and you show them the question or a problem...

(Patricia, 13, in-school girl, Kiosk A, Interview)

On the other hand, young people who were not enrolled in school indicated they engaged with specific aspects of the formal education curriculum to acquire knowledge that helped them with their daily
activities. For example, Salim noted that he learnt mathematics at the Kiosk to assist him with his farming.

Because I am a farmer, I needed to know maths so I can count when I am planting and harvesting and even when selling my fruits and vegetables. So, I went and started learning on that [Kiosk] addition and subtraction on Khan Academy. … As I told you I stopped school some years ago, so I had forgotten what I learnt then.

(Salim, 14, out-of-school boy, Kiosk B, Interview)

Ross, another out-of-school participant who dropped out of school three years before this PhD research, noted that the Kiosk supported him to develop literacy skills.

…reading is what I wanted the most on the computer and it has been teaching me alphabets. I watch YouTube videos; it teaches me sounds…

(Ross 15, out-of-school boy, Kiosk A, Interview)

Adult users who were enrolled in college or university also noted the Kiosks supported them to engage with their coursework.

…by the time the [Kiosk] was opened, I was in my third year of university, so I used it to do my coursework. I used to download pdf files that I need for my readings and assignments and also used the [Kiosk] to upload my work and sending my lecturers my assignments via email…

(Larry, adult, Kiosk A, Interview)

Most young people underlined the Kiosks were their first interaction with computers and indicated learning essential operating systems functions, Microsoft Office, and Internet functioning. The data shows that users who learnt how to use computers supported other users in learning computer skills. As a result, participants felt confident that they could now use the computer and Internet independently.

For me I learnt how to use the computer, before I had never used any, when I go there some of my friends show me what to press. Now I know how to put it on, search the Internet and get answers for the questions I am looking for. I have also been learning how to use Microsoft word for typing.

(Mark, 13, in-school boy, Kiosk A, Interview)

Although young people at Kiosk B had less access to the Kiosk compared to young people at Kiosk A due to the Kiosk being dominated by adult males, the data shows that participants at Kiosk B also felt the Kiosk provided them with an opportunity to develop computer literacy.

I have learnt the things that I don’t know. Like I did not know how to use a computer, now I can use Microsoft word and I can search on YouTube.

(Jack, 14, in-school boy, Kiosk B, Interview)
Moreover, a few young people at Kiosk A interested in computers developed a sophisticated understanding of computer functionality. For example, Liam described the concepts he learnt in programming as follows:

…I went to research on Khan Academy and BBC Bitesize some basics of programming. This is the method of creating some instructions that tell the computer how to perform tasks. So, I learnt the operating systems are the ones that control the computer. And after that, I learnt the modes of operation like multi-tasking, this is when many programmes are running at the same time for example, when an email is being sent and at the same time downloading a web page. Another one is batch processing, this is when data is collected together in a group for example, for bills like electricity and invoices.

(Liam, 16, in-school boy, Kiosk A, Interview)

Additionally, some parents felt that the Kiosk provided their children with the opportunity to develop computer literacy, a skill they felt was necessary for the current environment.

…With this new generation, they need to know computers wherever they go so it is a real advantage for them to have this opportunity.

(Mathew’s father, Kiosk A, Interview)

However, other parents felt that it would be helpful if their children were provided computer literacy training.

Is it possible to have computer lessons? I think it is important to have someone teach them.

(Jonah’s carer, Kiosk A, Interview)

Some teachers at Kiosk A also pointed out that the Kiosk was their first engagement with computers, providing them with the chance to develop computer literacy with the assistance of colleagues.

I am one of the teachers who at first didn’t know how to use a computer totally. But since we had that computer, [Elaine, another teacher] has been helping me a lot in learning the computer because she learnt computer studies and has been a good teacher of it…

(Ms. Jessica, teacher, Kiosk A, Interview)

On the other hand, other teachers felt the Kiosk encouraged self-directed learning enabling them to advance their computer literacy.

…it has helped me to learn more about the computer because I didn’t know much about the computer but the good of the [Kiosk], you can be alone and teach yourself when nobody is bothering you…

(Ms. Jane, teacher, Kiosk A, Interview)
The data also shows that Kiosk A provided Hillside school with the opportunity to introduce computer lessons as part of its curriculum. However, due to the computer becoming non-functional, this was affected.

…We had computer as a lesson on the timetable last year for each class but because this year it has been off, it was stopped. So, each class had a day for the computer.

(Ms. Jessica, teacher, Kiosk A, Interview)

Furthermore, teachers indicated Kiosk A supported instruction at Hillside school by bridging the school's educational resource constraint.

…I use it [Kiosk] when… we are learning about the skeleton because we don’t have these physical parts of a skeleton. …we usually go to the [Kiosk] computer, we type in and different structures appear, then a child is able to identify how a skeleton is…

(Ms. Elaine, teacher, Kiosk A, Interview)

Ms. Jane, another teacher stated:

…in literacy, they can ask types of transport some types of transport are rare. They know only road transport. So, when I am teaching, I take my kids to see what I teach physically at the [Kiosk], so it helps me to simplify my work as a teacher…

(Ms. Jane, teacher, Kiosk A, Interview)

Ms. Jenna, another teacher, highlighted the Kiosk became a resource that enabled her to update what she taught to align with changes in the curriculum, indicating the significance of the Kiosk in her lesson planning.

Some books we use are not up to date, there are missing some things. So, when I need to teach kids something and I fail to get from the book they [the school] have given me, I go to the [Kiosk] I search for that thing.

(Ms. Jenna, teacher, Kiosk A, Interview)

However, it also emerged that a few teachers did not have the skills to navigate the Internet and, as a result, struggled to find sufficient information for their teaching.

…let them give us more topics in that computer because sometimes we may search for the topic yet it’s not there. So let them put in more topics in the computer especially for primary section…

(Ms. Jessica, teacher, Kiosk A, Interview)

By complementing teaching at Hillside school, some teachers expressed that Kiosk A positively impacted the school’s reputation.
…many people have picked interest of bringing their children to us. …they know we have free internet; we can easily search and get to know what we don’t know, that means the academic standard is now improving than before. ….previously if you come across a question I didn’t know, I just left it out and skipped it… I wouldn’t give to the pupils because even as a teacher I don’t know the answer. But now I can come across a question I do research on the [Kiosk] and once I get its explanation and understand, I teach it to my students…

(Ms. Elaine, teacher, Kiosk A, Interview)

Some young people enrolled in school noted that the Kiosks promoted their vocabulary development, indicating specific new words they learnt due to their engagement with the Kiosks.

…it has helped me to learn new English words and vocabulary. …for example, I learnt the word ‘fragile’ through watching an English practice video on Khan Academy. So, I learnt that it means it’s something that can easily break…

(Patricia, 13, in-school girl, Kiosk A, Interview)

In contrast some other young people felt their vocabulary development was accidental and an outcome of their research at the Kiosk.

…Though the English in this [Kiosk] is somehow hard to that of my notes but I learnt new words…

(Jonah, 17, in-school boy, Kiosk A, Interview)

On the other hand, young people who were not enrolled in school at Kiosk A reported learning English.

I got a chance to learn English, I watch English cartoons and learn new sentences then I write them, so I do not forget. I use them when speaking to people…

(Samira, 12, out-of-school girl, Kiosk A, FGD)

In addition, some teachers at Kiosk A noted the Kiosk supported them to improve on their vocabulary.

Even in English it has been working as a dictionary you go and make research for meaning of words and learn new vocabulary…

(Ms. Jessica, teacher, Kiosk A, Interview)

Some young people outlined the Kiosks provided them with information that supported them to develop skills to extend specific interests. For example, in the case of Suleiman, he indicated that Kiosk A provided him with the opportunity to nurture his interest in photography.

It has been helping me to learn about photography and photo editing. Now there is a photography shop near here that I volunteer at…

(Suleiman, 16, out-of-school boy, Kiosk A, Interview)
Additionally, some users described how the Kiosks supported them to learn concepts they felt were relevant to their daily tasks. For example, Salim noted Kiosk B enabled him to learn techniques that helped him in his farming.

I learnt farming methods that prevent soil erosion like contour farming and planting trees to break the wind. As you can see our land here is very hilly, in the rainy season I used to lose a lot of crops but now that has reduced. […] I also learnt about some farming tools that I did not know about like dibber⁵…

(Salim, 14, out-of-school boy, Kiosk B, Interview)

Jason, an adult participant who also practiced farming outlined what he learnt at the Kiosk to improve his farming and noted how the knowledge he acquired supported him to generate an income from selling his produce.

What I have been able to learn was passion fruits farming and tomatoes. …I made research on YouTube and Google they told me of ways on how I can keep them and how to keep parasites away from my garden; how to irrigate my crops during dry season and it helped me so much at that time because with what I did I was able to sell and get money and was able to buy my land property…

(Jason, adult, Kiosk A, Interview)

Jerry, another adult user, explained learning a typing programme at Kiosk A that improved his typing efficiency, enabling him to acquire more secretarial work at his business leading to an increase in his income.

I was learning some new programmes… so it is called Marvis Beacon. …to get more keyboarding skills and improve on my typing speed because I do secretarial services at my business. […] I got more typing skills and improved on my speed and that helped me to get more clients with typing work.

(Jerry, adult, Kiosk A, Interview)

Ms. Jane, a teacher at Hillside school, pointed out that the Kiosk supported her to learn new strategies of managing children.

… Even I learnt more about how to handle kids, so I go to the computer and make more research on how we handle the kids on YouTube and watched the videos…

(Ms. Jane, teacher, Kiosk A, Interview)

Some participants also pointed out that the knowledge they gained from the Kiosks helped them to solve some problems the community faced. For example, in the case of Patricia, she learnt a home remedy to

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⁵ A pointed wooden stick used to make holes in soil to allow seeds and seedlings to be planted
treating diarrhoea which was a problem for the community due to the water quality within this low-income context. By sharing the knowledge on a home remedy for treating diarrhoea, Patricia created awareness that benefitted individuals, suggesting that individuals saved the money used to pay hospital charges.

…We sometimes have a problem of diarrhoea because of the water here and going to hospital when we get it is expensive. I went and searched on that computer for at home treatment and I found that oral rehydration salt helps to replace the salts and water the body loses. I came back and I taught my fellow students during a science lesson how to do prepare oral rehydration salt. That you first wash your hands, then you prepare three spoons of salt, eight spoons of sugar and you mix it in water.

(Patricia, 13, in-school girl, Kiosk A, FGD)

Besides supporting users with their specific learning, the Kiosks provided users with information on current world affairs. Many users appreciated the barriers that were broken due to the existence of Kiosks emphasising the ease it has brought for them to be updated with current affairs in an accessible format.

That [Kiosk] is useful because I can get information on what is happening around the world. You know we don’t have phones that are smart or any money to buy data…

(Irving, 12, in-school boy, Kiosk B, Interview)

All participants appreciated the speed and convenience to access information that the Kiosks brought. One out-of-school user described his experience as follows:

…it has speed and I ask a question and it will immediately bring for me the answer. The answer of which they bring is a variety and I am able to understand better...

(Fuad, 17, out-of-school boy, Kiosk A, Interview)

In addition, some users at Kiosk A noted that the Kiosk provided them with information that enabled them to become aware of other places outside their locality.

…also, things I have never seen on YouTube like international places…

(Suleiman, 16, out-of-school boy, Kiosk A, Interview)

Finally, Kiosk A data shows that the Kiosk promoted community learning as users, specifically young people shared what they learnt with their families, peers, and teachers.

[Patricia] went to do research on independence in Africa and came back telling me, ‘Mum, I found that the one who led Ghana to independence is Kwame Nkrumah. As I am not educated, I didn’t know and was happy to learn from her...

(Patricia’s mum, Kiosk A, Interview)
The data presented in this sub-section demonstrates how the Kiosks provided users with the opportunity to learn and understand concepts relevant to them. For young people who were enrolled in school, the Kiosk supported them to understand concepts in their school subjects, particularly in science and mathematics disciplines. In addition, adults in college/university also used the Kiosks to facilitate their understanding of their coursework. On the other hand, young people who were not enrolled in school engaged with specific aspects of formal education to equip them with skills to perform their daily tasks. The findings also show that Kiosk A supported teachers at Hillside school and helped bridge educational constraints experienced within the low-income context. The data also indicates that the Kiosks provided users with information that enabled them to perform their tasks. The Kiosks also encouraged community learning as users, particularly young people shared the knowledge gained with peers, parents, and teachers. Some young people were also able to develop skills for specific interests they had at the Kiosks. Finally, the data shows that the Kiosks provided users in these low-income communities with information on current affairs, enabling them to be updated with current events within the country and internationally. The next sub-section presents data on the influence on the quality of life.

### 7.2.2. Influence on the quality of life

The second sub-theme that emerged under opportunities was the influence on the quality of life, which explores the impact on soft skills development and the effect on the social and economic status of users of the Kiosks in these low-income communities. The data presented in this section covers codes that emerged for influence on the quality of life: financial gain, supporting local businesses, building capacity, social impact, collaboration skills, leadership skills, increased motivation and self-belief, problem-solving skills, smartphone purchase and enjoyment. The sub-section commences with presenting findings on the economic influence of the Kiosks and progresses to present data on social impact and soft skills development.

The majority of stories and testimonials show that the access to ICT at the Kiosks provided users with the possibility to improve their quality of life through continuous knowledge access and connectivity. In the words of one participant:

… This would never have happened if the [Kiosk] was never there. So, the [Kiosk] was the main source of knowledge for me with everything I learnt because I started with the [Kiosk]. At that time, I didn’t have even 1000 Uganda Shillings [£ 0.20] to buy data bundle to put on my phone. […] I have been able to get jobs through social media… […] It’s because the main source of knowledge was the [Kiosk]. If they repair the [Kiosk], I think you can get ten [Jasons] from the [Kiosk] because it has promoted me…

(Jason, adult, Kiosk A, Interview)
The first aspect within the sub-theme of ‘influence on the quality of life’ that emerged from the data analysis was the economic prospects the Kiosks provided for users. Some users identified that the Kiosks provided them with an opportunity to earn an income. In the case of Ms Jane, she described the changes that occurred in her life due to the financial assistance she obtained from the online connections she made at the Kiosk.

…When I went, I opened Facebook and Gmail and I got friends who help me because they send me help from abroad even my kids have got sponsors which I think there are others who have benefited like me from the [Kiosk]. Before the [Kiosk] came I was so badly off girl what I am telling you, that’s the fact I was in a small house, I couldn’t afford to pay for my kids’ school fees, but when those people came [Kiosk developers] and they opened for us Facebook, so we got many successful friends abroad.

(Ms. Jane, teacher, Kiosk A, Interview)

In the case of Fuad, he noted obtaining income from assisting some people in downloading applications on their phones at the Kiosk.

…I have been helping out other old people who don’t know how to download Apps to download apps on their phones. …it’s a source of income that I can go there and put WhatsApp because someone will tell me they want WhatsApp on their phones when they haven’t come to the [Kiosk] before so they don’t know how to do it. So, I go there and put for them and then the person gives me some money. …they can give sometimes like 3,000 Ugandan shillings [£0.60] or 5,000 Ugandan shillings [£1]…

(Fuad, 17, out-of-school boy, Kiosk A, Interview)

In the case of Jason, he noted that Kiosk A provided him with an opportunity to create a portfolio of income generation activities which included obtaining supplemental income from YouTube vlogging.

…I used my YouTube channel I post there my videos and get views and then they pay me… Last year they [YouTube] gave me 47,000 Uganda Shillings [£9.35]…

(Jason, adult, Kiosk A, Interview)

He further noted that accessing the Internet via the Kiosk has allowed him to use his social media account to advertise businesses for individuals in this low-income community, which led him to generate more income from providing this service.

…there are others who came to me with pictures of their boutiques and told me [Jason], help us to advertise our business. So, they started by giving me some little money… in a month I can earn something like 300,000 Uganda shillings [£60] from several people because I always advertise their businesses…

(Jason, adult, Kiosk A, Interview)
Jason also indicated he obtained job opportunities on social media via the Kiosk.

…I have been able to get jobs through social media. … what I will tell you I have tried out almost every job; I farm, I build, I paint… Now this is brickmaking [shows a picture].

(Jason, adult, Kiosk A, Interview)

In the case of Jerry, he used the typing knowledge he had acquired from the Kiosk to teach young men typing and charged them a fee.

I have some other youth I was teaching them typing and about Microsoft Office you know in typing mostly we use Microsoft word. …I charged each student 5,000 Uganda shillings (£1)… we were coming three days in a week and that is Monday, Wednesday, and Saturday from 11pm to 12am…

(Jerry, adult, Kiosk A, Interview)

The data also shows that the Kiosks provided some users with access to opportunities to build their capacity, enabling them to improve their livelihood. For example, Eddie, who was featured earlier, created a small-scale business due to the knowledge he acquired from the Kiosk, which enabled him to improve his standard of living. In Jason’s case above, besides creating a portfolio of income, he obtained jobs via social media. Like Jason, Fuad also gained employment via social media, which enabled him to improve his livelihood.

…it [the Kiosk] has helped me to get a job on Facebook, the other time when I was looking for a job everywhere, I found the job at the construction place up there on Facebook. They advertised it in a Facebook group…

(Fuad, 17, out-of-school boy, Kiosk A, Interview)

Some adult users of Kiosk A also utilised it to support their businesses. For Larry, who owned a phone repair shop, the Kiosk WiFi assisted him to unlock his customers' phones, thereby enabling him to secure more work due to the free WiFi access.

…unlocking some phones, a client can come here when the phone is requesting for WiFi to bypass that kind of obstacle but when you can’t access WiFi, it means that client is also going to go. But here when you are sure that WiFi is there, you can say, ‘tomorrow morning you come back, then he leaves you with the phone, you go you set it well, when he comes, he pays me 3000 to 4000 Uganda shillings (£0.60 to 80] after I have finished fixing for him his phone…

(Larry, adult, Kiosk A, Interview)

For Jerry, the Kiosk WiFi supported him to download software and applications which he sold at his business enabling him to earn an income.
I download software like anti-viruses, music apps like VLC… there is another typing app which I use, it needs updates, so those updates I was getting from the [Kiosk]… The WiFi was helping me to download, it’s these things that I was downloading from it that I get money from it…

(Jerry, adult, Kiosk A, Interview)

The data also shows that access to free Internet at the Kiosks motivated some users to purchase smartphones to benefit from the free WiFi access. Having a smartphone was a privilege for individuals in these low-income communities, which required some sacrifices. All individuals who bought smartphones indicated they had to do some extra work to save up money to afford a smartphone. Additionally, a few young people’s parents also bought smartphones for their children (as seen in one of the case examples presented earlier) after seeing the benefits the Kiosks had on their children.

…I used to first come at [Kiosk B] and found some boys using their smartphones… because by that time I had a small phone, it was an Itel, but it was not a touchscreen. …I decided to save some money so when I got the money and went to town and bought a smartphone…

(Jason, adult, Kiosk B, Interview)

The second aspect discussed in this sub-section that emerged from the data analysis was the social influence the Kiosks had on users. The findings show that the Kiosks became important spaces where users strengthened social ties with their community through their interactions at the Kiosks, as seen in the case examples presented earlier. Many young people highlighted that the Kiosks provided them with an opportunity to nurture friendships by collaborating with others at the Kiosks.

The opportunity I get, it brings friendship when studying with other people that I don’t know. I made a lot of friends at the [Kiosk]…

(Patricia, 13, in-school girl, Kiosk A, Interview)

Some young people, particularly at Kiosk A, reported that the Kiosk fostered their sense of belonging within the community.

Before they brought that computer, I did not know many people of my age in this village, so I did not have friends that much. But since I started going there, I made new friends.

(Gemima, 13, in-school girl, Kiosk A, FGD)

Additionally, I noticed during my visits in January and February 2018 that despite the computers at the Kiosks being non-functional, they were still a social hub where people had conversations with some seating on the cemented seats at the Kiosks and others standing. Simultaneously, others had chairs and an informal table (made from timber structures) and played board games. People who owned
smartphones at Kiosk A also accessed the WiFi with three to four friends since not everyone could afford buying a smartphone.

Besides the physical interaction at the Kiosks, most participants talked about the Kiosks offering them new opportunities to build relationships with people in other geographical locations, nationally and internationally, creating a sense of connection to a broader world.

…when I came here, I found people chatting on Facebook I also got interested and I joined. …I made new friends from different places around the world…

( Jonah, 17, in-school boy, Kiosk A, Interview)

Adult users particularly emphasised the speed and ease to which they could communicate improved their relationships with others. More specifically, teachers' sentiments show that Kiosk A WiFi facilitated communication between them, enhancing Hillside school's functioning.

I’ve been connected to friends than before so it has made my communication easy because sometimes mostly on WhatsApp sometimes, I could take a long time without loading airtime. But now with the WiFi of the [Kiosk] communication has become fast and easy; I just communicate on WhatsApp with our supervisors… So, it has made communication easy for me.

(Ms. Elaine, teacher, Kiosk A, Interview)

A few adult participants reported the new online connections afforded by the Kiosks provided them possibilities to learn new things that led to advancements in their lives.

I have a friend in the US so she told me you can be able to get money from blogging, so I got the idea of Facebook blogging from her.

Jason, adult, Kiosk A, Interview)

The third and final aspect under the sub-theme of ‘influence on the quality of life’ presented in this subsection is the impact on soft skills development. The data shows that many young people appreciated the Kiosks' collaborative nature, indicating that it encouraged them to develop collaborative skills.

…Because we have to share that computer it makes us work together.

(Irving, 12, in-school boy, Kiosk B, Interview)

Patricia, another participant, described how collaboration at the Kiosks encouraged teamwork, stating:

…It promotes unity when you are working together because other children come and then you work together the question and then you get the answer…

(Patricia, 13, in-school girl, Kiosk A, Interview)
Like in the example cases presented earlier, many participants who had acquired basic computer literacy felt the Kiosks provided them with an opportunity to emerge as leaders by assisting others to learn how to utilise the computer, thereby perceiving themselves as mentors in their community.

...I find kids and teach them how to use the computer like how to type and save a document, searching the Internet and how to look for a variety of information…

(Fuad, 17, out-of-school boy, Kiosk A, Interview)

Many participants also felt that the Kiosks provided them with an opportunity to nurture their leadership skills, indicating a sense of accomplishment for contributing to their community in that way.

…Some members which I lead come to me and tell me we don’t know how to use a computer; can you teach us? And I go there [the Kiosk] and I teach them.

(George, 16, in-school boy, Kiosk A, Interview)

Furthermore, some participants at Kiosk A expressed that the opportunity to build relationships at the Kiosk and emerge as a leader brought them a sense of popularity, increasing their rapport within their community.

…it has helped me to interact with many people, many friends as I am always around the [Kiosk] so I get many people who come to the [Kiosk] and we interact. I think I am well-known… So, I am a common figure…

(Ms. Jane, teacher, Kiosk A, Interview)

The data also shows that many participants identified an increased feeling of accomplishment after achieving their goals which improved their motivation.

…like in my group at school they can say that you have the answer okay you give us, and it makes me feel good because I am becoming a leader. Because I know my group depends on me for answers, my interest in my studies increased and I do a lot of research.

(Jacob, 14, in-school Kiosk B, Interview)

Many participants expressed becoming competent in what they had learnt at the Kiosks, which suggested an improvement in their self-belief and confidence.

I had a problem I didn’t know anything, like I told you I dropped out in primary three, but ever since they brought that computer, then I started using it for reading and all, now I can read, I can speak English. Now I know something, there is a change on my life because of that computer.

(Ross, 15, out-of-school boy, Kiosk A, Interview)
Additionally, many parents also felt the Kiosks provided their children with an ability to express themselves. One parent stated:

He comes home and converses with us what he learnt, he says, I can open, I can do this and that.

(Mathew’s father, Kiosk A, Interview)

The data also shows that the Kiosks supported some users who owned phones to address technical issues on their phones, as illustrated earlier (Garry’s case). Jason explained how the Kiosks helped users in fixing their phones.

…you would find someone has a technical problem on their phones and it needed them to go to town to fix the phone and they had to pay so now someone can come here and use the [Kiosk] to flash their phones and it gets fixed…

(Jason, adult, Kiosk A, Interview)

Finally, most participants particularly young people perceived the Kiosks as a fun place where they became entertained, indicating excitement about the Kiosks.

…I watch some cartoons and I watch some movies, some songs and I go and play with my friends, I watch some videos, sometimes we record our voice with my friends…

(Kelly, 11, in-school boy, Kiosk A, Interview)

Patricia, another participant stated:

I use it for entertainment to play fun online games. The games I play is football and even the motorcycle games.

(Patricia, 13, in-school girl, Kiosk A, Interview)

The findings presented in this sub-section illustrates how the Kiosks created economic opportunities and financial benefits for users, enabling them to improve their livelihood. The data also showed the significance of the Kiosks as social spaces as users developed both in-person and online friendships as a result of their engagement with the Kiosks, thereby creating opportunities for learning and information sharing. The data also shows that access to the Internet brought ease in communication for users, strengthening their connectedness with others. The data also indicates that the Kiosks helped users, particularly young people, develop soft skills that included collaborative skills, leadership skills, increased motivation, self-belief, and confidence as a result of the knowledge gained at the Kiosks. Finally, the data shows that young people considered the Kiosks a fun place that provided them with entertainment.
Despite these numerous opportunities, the data shows some limitations that emerged due to the existence of the Kiosks limited impact. These are presented in the next section.

7.3. Limitations

This section presents data on the limitations that emerged as a result of the Kiosks’ existence encompassing pornography and social vices. The section commences with the issue of pornography and progresses to present data on social vices. A significant limitation that emerged from the data analysis due to the existence of the Kiosks was the possibility of children being exposed to age-inappropriate content on the computers at the Kiosks that some adult users accessed, specifically pornographic content.

…those elder men watch blue movies [pornography] during the day when us children are there, and many children end up seeing things they should not be seeing…

(Jacob, 14, in-school boy, Kiosk B, Interview)

Young people at Kiosk A also expressed frustration with the possibility of some users accessing pornography at the Kiosk exposing them to unsuitable content for their age.

…there are some people who come and put blue movies [pornography], that’s what annoys us about going there.

(Derrick, 15, in-school boy, Kiosk A, Interview)

Teachers at Hillside school also expressed concerns about some community users being irresponsible and leaving pornographic content on the screen at Kiosk A, which compromised children’s innocence. One teacher described a personal experience where her child accessed content that was unsuitable for his age.

Another big challenge we have is sometimes the people who sleep at the [Kiosk] watch pornographic movies and leave them there so our kids come early on the computer and find them. The last time I was much challenged because I always come to church in the morning to pray and to see what’s going on. Now my kid a five year old boy when we finished, he went to the computer. The builders are the ones who told me when they saw him watching a pornographic movie…

(Ms. Jane, teacher, Kiosk A, Interview)

Many parents in these low-income communities did not understand the vastness of the Internet; however, Ms Jane understood its magnitude and the associated negative consequences of the Internet. Even though it might not have been pornography, her five-year-old could have accessed something unsuitable for his age, and if other children were present, they might have seen inappropriate content.
Although the possibility of young people finding pornographic content on the computers existed at both Kiosks, the data shows that Hillside school, together with the committee overseeing Kiosk A, initiated measures to mitigate this limitation. These measures reduced the likelihood of young people coming across pornography at Kiosk A, unlike Kiosk B, where no steps to mitigate this limitation existed.

So how we did to control that [pornography], we make sure for example for my case since I live here within the school, I make sure every morning… I could come here earlier than the pupils then I put it [the computer] on and I check what is there and remove anything that is inappropriate that a kid can come across. If it’s not there, I would just leave. So, this is how we are trying to control this...

(Ms. Elaine, teacher, Kiosk A, Interview)

However, the data shows that some assumptions existed about what different users accessed the Kiosk for, and some young male users expressed that they were mistaken to be the people who accessed pornographic content. They indicated that they were punished and banned from using the Kiosk when pornography was found on the screen whilst they were at the Kiosk.

…When that madam who is the Director of the school [Ms Elaine] finds pornography on the screen when you are not the one who put it, she can punish you and chase you away even when you are not the one who has been searching for it…

(Jonah, 17, in-school boy, Kiosk A, Interview)

The possibility of children being exposed to unsuitable content at the Kiosk led to some community members who resided within the low-income community where Kiosk A was built to assume that the Kiosk only presented negative effects on the community, which affected the reputation of the school. Part of the reason for the existence of this assumption was due to the gaps that existed in how the project was introduced to the community (see section 5.1), which suggests that these community members may not have been aware of the potential of the Kiosk.

…some people in the community take it as if it’s pornographic, they think our pupils are just here to use the internet to learn pornographic things, so they don’t know the positive impacts on the [Kiosk]. They think it is here just to waste our time and they think when some of our learners are here to use the computer and do not concentrate in class…

(Ms. Elaine, teacher, Kiosk A, Interview)

No data existed on community’s assumptions about pornography at Kiosk B. This could be because the community associated the Kiosk with men who dominated it and viewed it as unsafe for young people particularly girls as shown in the data in the previous chapter (see section 6.1).
Some participants also expressed that another emerging threat was that some adults used drugs and alcohol at the Kiosks in the presence of children and as a result exposing them to learn these social vices.

…They come and use drugs and alcohol at the [Kiosk] which makes young children learn such behaviours and start using alcohol…

(Jason, adult, Kiosk A, Interview)

Finally, teachers at Hillside school indicated that some users who accessed Kiosk A at night slept in the school's classrooms when they got tired, inconveniencing the school's routine the following day. As seen in figures 5.1 and 5.2, the classrooms in the school were missing doors and windows, making the classes easily available to users of the Kiosk.

…And some didn’t even go back, they used to sleep in the classes you find somebody busy asleep in the class very early in the morning which was not good…

(Ms. Jessica, teacher, Kiosk A, Interview)

The data presented in this section provided insight into understanding the limitations that emerged from the Kiosks existence. The findings illustrate how these limitations posed negative consequences, particularly for young people where a possibility of them being exposed to content unsuitable for their age at the Kiosk, particularly pornography, existed and exposure to drugs and alcohol they may see as an aspirational activity. These findings, together with the data on opportunities presented earlier, are discussed in the next section.

7.4. Discussion

The evidence presented in this chapter shows how the Kiosks were used and highlights the opportunities and limitations that emerged from the existence of the Kiosks in the low-income communities of this PhD research. The findings on opportunities indicate that the Kiosks were perceived to have brought numerous positive impacts. All young people enrolled in school pointed out that the Kiosks supported them in understanding their school topics. Most of them noted that they initially struggled to understand science and math concepts and explained how the Kiosks facilitated their understanding through media resources. They indicated mainly accessing Khan Academy, BBC bitesize and YouTube for resources related to their school topics. As a result, many of them reported that the Kiosks positively influenced their overall performance, with some of them explicitly pointing out how their grades improved. In addition, some young people indicated improving their English vocabulary due to their engagement with the Kiosks. Some participants noted that this vocabulary development was deliberate, while others noted
it was an outcome of their research at the Kiosks. These findings align with previous studies (such as Dangwal and Thounaojam, 2011; Dangwal et al., 2014) established that the Hole-in-the-Wall computers, a similar initiative assisted young people to improve on their school subjects. The findings in this chapter progresses this discussion forward by demonstrating that where CTCs were located, CTCs played a crucial role in determining young people's access and level of engagement with them, which influenced the degree of impact on their learning. The data presented in this chapter shows that more young people engaged with Kiosk A than B because it was located in a school, an environment that encouraged their access and supported their learning compared to Kiosk B, which was by the market.

The findings further demonstrate how the Kiosks supported young people who were not enrolled in school to engage with content in the formal education curriculum they felt were relevant to their life context. This data suggests that the education curriculum in Uganda is not well aligned with the skills needed to address challenges encountered outside school. This finding echoes studies (such as Datzberger, 2018; Mitana et al., 2018) in the literature that highlight that the Ugandan curriculum does not equip children with the skills required outside school. This data adds depth to the literature focusing on how ICT could be used in non-formal contexts (such as Yasunaga, 2014) to support out-of-school children by demonstrating how they engaged with ICT to support their learning. This evidence suggests how a practical approach that focuses on individual needs can help them acquire relevant knowledge for their daily activities.

Furthermore, the findings show how Kiosk A assisted in bridging the educational resource constraint the school faced. As indicated in section 1.4, many schools in Uganda lack essential instructional resources, including textbooks. The data in this chapter shows that Kiosk A assisted in minimising the resource constraint by providing teachers with access to educational resources online. Teachers at Hillside school who participated in this PhD study indicated that they used the Kiosk to demonstrate the concepts they taught to their students. This finding shows that the Kiosk being in a school was convenient as teachers could easily take their students to the Kiosk when they wanted to illustrate what they taught. The data also shows that the Kiosk supported teachers to obtain updated content for their teaching as the school's textbooks did not have current curriculum content. Finally, a few teachers noted they learnt new strategies for classroom management. The data presented in this chapter illustrates how the Kiosks helped bridge the challenges facing education in these low-income communities by providing young people and teachers with educational resources online, thereby suggesting that the Kiosks helped to improve
education in these low-income communities. However, the data shows that some users did not have sufficient competence to navigate the Internet, and due to this, they struggled to find adequate, relevant content. This finding suggests that when CTCs are introduced in low-income communities, they should be accompanied with training on browsing skills to support users navigate the Internet.

Most participants expressed that they had developed basic computer literacy through self-directed learning and assistance from peers, a finding that echoes previous studies (such as Wamuyu, 2017; Kuika Watat, 2020) examining CTCs. However, the data highlights that the proficiency level varied among users, with only a few participants developing sophisticated computer functionality skills such as programming skills, and most of them only basic Microsoft Office skills. Although the limited navigation skill contributed to this outcome, the data shows that only a few participants had this challenge. More broadly, this outcome could be attributed to the Kiosks' inequitable access discussed in the previous chapter, thereby suggesting that participants who had limited access could not develop much computer literacy. Additionally, the data in the previous chapter also indicated that some participants in this study require computer literacy training, which suggests for CTCs to consider user groups' diverse needs, including computer literacy training to increase impact.

The data further shows that the Kiosks equipped adult users with the knowledge, enabling them to create opportunities to generate an income, leading to improvement in their livelihood. Adult users who owned small-scale businesses indicated that the knowledge they acquired from the Kiosks helped them to create more revenue. The data also shows that the Kiosks created new possibilities for other users enabling some to start businesses and others to find and secure employment opportunities via the Kiosks. The data also shows that Kiosk A particularly provided some users with a financial benefit. The findings also indicate that some users, mainly young people shared the knowledge they had acquired with peers, teachers, and their families, which suggests that the positive influence of the Kiosks went beyond the users and benefitted a wider community. These findings suggest that when low-income communities are provided with resources, they have the capacity to improve on their quality of life.

The findings also demonstrate that the Kiosks became vital social spaces where all users fostered social ties with their community through interactions at the Kiosks. Many young people noted they had made new friends at the Kiosks, and some of them indicated Kiosk A, in particular, nurtured their sense of belonging in the community. Many young people linked this to the Kiosks' collaborative nature. They
shared a computer and developed a peer learning process to address a question and assisted each other in using the computer. These findings contribute to the limited data that indicated CTCs offer low-income communities with social spaces where individual and community needs are addressed (e.g., Baron and Gomez, 2013; Nemer, 2018a). It expands on this discussion by demonstrating how peer learning at the Kiosks by young people enabled them to develop collaborative and interpersonal skills. It also shows how the Kiosks provided many users with an opportunity to build online connections and relationships that afforded them new learning opportunities and better communication. Some of them obtained new income possibilities, leading to an improvement in their quality of life. Despite these social benefits, the data in chapter six also shows that young people faced bullying and harassment, suggesting that the Kiosks represented both spaces for some users at different times depending on who was present at the Kiosks.

The evidence also shows that the Kiosks enabled many users to develop soft skills such as teamwork, leadership, and interpersonal skills. Many participants indicated the Kiosks provided them with an opportunity to emerge as leaders as they assisted other users. Some users stated the Kiosks provided them with the knowledge that enabled them to solve specific problems. At the same time, some other participants pointed out that the knowledge they acquired at the Kiosks provided them with the competence to implement what they had learnt, which suggests that the Kiosks boosted their confidence and self-belief. This evidence addresses the identified gap in the literature on soft skills development (see sections 1.3 and 1.4) by demonstrating how non-formal learning contexts such as the Kiosks examined here begins to bridge this gap for low-income communities in Uganda. It contributes to the anecdotal research on the influence of CTCs on intangible impacts particularly soft skills conducted in other contexts (e.g., Osman and Tanner, 2017 in South Africa and Tabassum et al., 2019 in Malaysia) by providing evidence to facilitate an understanding of how low-income communities in Uganda can be supported to acquire soft skills.

While the Kiosks provided numerous opportunities to the users in the low-income communities where they were built, the findings show that some limitations were associated with them. A significant limitation of the Kiosks that emerged from the data analysis was the possibility of children being exposed to unsuitable content for their age at the Kiosks, specifically pornography. Although this limitation existed at both Kiosks, the data shows that Hillside school and the committee overseeing the Kiosk initiated measures to mitigate the limitation. This minimised the possibility of young people being
exposed to pornographic content at Kiosk A compared to B, where no steps to reduce this limitation existed since there was no committee in place to regulate the Kiosk. As highlighted in the literature, data on the limitations that come with ICT adoption particularly negative online experiences children encounter is scarce in low-income communities in the Global South (see Livingstone et al., 2017) and as a result interventions educating children on negative online experiences are few (Banaji et al., 2018). This finding contributes to this area of research by presenting evidence on the potential negative effects children encounter online in the context of Uganda which will inform discussions that lead to formulation of interventions that teach children about potential negative online experiences and how they can be safe online.

Additionally, since these potential negative online experiences children encounter are known to the low-income communities in the context of this PhD research, the data shows that introducing an intervention that will educate children on negative online experiences will not be hampered by social and cultural norms. This finding suggests for CTC practitioners in Uganda and other similar African contexts to consider formulating with the low-income communities’ measures that mitigate the potential of children being exposed to unsuitable content for their age. This also includes formulating with the community context-sensitive training for children on how they can be safe online.

Another limitation that emerged from the existence of the Kiosks was that some adults used drugs and alcohol at the facilities in the presence of children. Both children and the community as a whole were concerned about the potential of children seeing these activities as an aspirational activity to imitate. Additionally, the data in chapter six shows that some of the bullying and harassment of young people resulted from adult men under the influence of drugs and alcohol being aggressive to young people. This suggests that the issue of drugs and alcohol was an existing problem within the community which became more evident with the existence of the Kiosks. As presented earlier (see section 5.1), sufficient engagement with the communities was not conducted to understand the complexities of low-income communities. As a result, many existing problems were not known to the implementers of the Kiosks i.e., Skills to Survive and Helping Hands and due to this, measures to mitigate them were not put in place. This finding suggests the need for CTC practitioners to thoroughly understand the context through engagement with the communities to co-create measures with the community to address these threats. The results on limitations link back to the data on barriers to access discussed in the previous chapter, suggesting a context-specific approach when designing and implementing CTCs.
7.5. Summary

In summary, the findings in this chapter established how the Kiosks created learning opportunities for both young people and adults. It outlined how young people who were enrolled in school were supported and showed how out-of-school young people engaged with school curriculum content that they felt was relevant to their life context. This finding illustrates how a practical approach that focuses on the individual needs of out-of-school children can be adopted to support the acquisition of knowledge relevant to their everyday experiences.

The findings also illustrated how the Kiosks provided users with an opportunity to build online connections and relationships that afforded them with new learning opportunities, better communication, and new income possibilities, which influenced their quality of life. The chapter also demonstrated how the Kiosks supported soft skills development, including leadership, collaboration, interpersonal and problem-solving skills, self-belief, and confidence. These findings provide evidence as to how low-income communities in Uganda can be supported to acquire soft skills.

Finally, the findings on limitations suggest the need for CTC practitioners to thoroughly understand the context by engaging with the communities to co-create measures with the community to address them. Additionally, the data on the potential negative effects children encounter online will inform considerations for interventions that teach children about possible negative online experiences in Uganda and how they can be safe online in unsupervised ICT environments such as CTCs.

The next chapter seeks to understand where gaps existed between CTC design and the reality in the low-income communities of this PhD research to establish the vital aspects that are important in promoting the sustainability of the Kiosks and other similar CTC interventions in Sub-Saharan Africa.
Chapter 8: Assessing Sustainability Aspects: Understanding the Design-Actuality Gaps

The previous chapter identified the opportunities the Kiosks created. However, the data presented in chapters six and seven also uncovered some existing complexities within the communities that became apparent because of the Kiosks and new limitations that emerged from the Kiosks. To address the third research question “What aspects are crucial in promoting the sustainability of the Kiosks and similar CTC interventions in low-income contexts?” this chapter explores where gaps existed between the design and implementation of the Kiosks and the local reality. As stated earlier (see section 3.2), it is fundamental to situate ICT, in this case, the Kiosks, within the target community's social and cultural context.

Guided by the sociocultural lens framing this research, the two cases (Kiosks A and B) data are compared to examine the gaps in knowledge and processes contributing to sustainability issues. The analysis generated two interrelated dimensions to these issues; stakeholder engagement and, technological design and maintenance, presented in this chapter. The chapter also provides suggestions for how the contextual complexities could be addressed. Finally, the chapter draws together the findings of this PhD by presenting and discussing the proposed Context Complexities framework, which resulted from the data analysis. The proposed framework is a tool that aims to guide CTC design and implementation processes in low-income communities in Uganda and similar African contexts.

The chapter is organised as follows: Section 8.1 presents findings on stakeholder engagement, and 8.2 covers technological design and maintenance. Section 8.3 discusses these findings in relation to the literature. Finally, section 8.4 presents the proposed Context Complexities framework and its elements.

8.1. Stakeholder Engagement

This theme links back to the processes that were involved in establishing the Kiosks (see section 5.1). Although Skills to Survive acknowledged the importance of community participation, the data shows gaps existed in the engagement with Helping Hands and the low-income communities where the Kiosks were built, suggesting inefficient stakeholder engagement. As presented in section 5.1, the project was not collaboratively formulated with Helping Hands and the local communities as it was designed before initial consultation with Helping Hands and the communities. Due to the approach taken, Helping Hands and the local communities could not influence the decisions on the design of the Kiosks to ensure
suitability with the local context. As a result, the existing complexities within the context were missed in the project design. For example, if Skills to Survive would have involved Helping Hands, and the local communities in the project's design, the role gender and power dynamics played within the social and cultural context in accessing the Kiosks could have been recognised.

As identified in the data analysis, a power relationship existed between Skills to Survive and Helping Hands. The findings in section 5.1 clarified that Skills to Survive created the partnership with Helping Hands for them to implement the project. However, this data also shows that Helping Hands were not involved in designing the project. As a result, this impacted the power dynamics suggesting that power was unequal between the two organisations and decisions were driven by Skills to Survive. For example, as presented earlier in the data analysis, it was expected for theft to be a challenge that affected the Kiosks.

… this was something new in the community and the greatest worry that I had was mostly on the area of theft. …it’s outdoor you know most of the projects that people do are indoor and if it’s done outdoor it’s a one-time thing that gives you a skill and then you use the skill. But this is something that stays in the community day in day out for the rest of the year, you know. So, my greatest worry was that theft would be one of the challenges that we are going to face throughout the entire time…

(Nelson, Helping Hands representative, Interview)

However, the data shows that this challenge was not raised with Skills to Survive before the project implementation as the project was designed prior to meeting Helping Hands. Skills to Survive had a set idea of how the project would be implemented, indicating that Helping Hands did not have an influence on the design of the project, thereby having an impact on the stakeholder engagement.

It was difficult because they [Skills to Survive] had a certain way that they wanted the project to be done…

(Nelson, Helping Hands representative, Interview)

Nevertheless, when Nelson was asked to discuss further the details about how Skills to Survive wanted the project to be done, silence was observed. This has been analysed as meaningful silence in the data analysis as it was seen as form of evasion since Nelson diverted the discussion by shifting the blame to the communities stating:

But then you know within communities there are people who support the initiative and then there are those who don’t support the initiative… these are the people who came and took off with some of the spare parts of the [Kiosk]

(Nelson, Helping Hands representative, Interview)
This meaningful silence that emerged in form of evasion was interpreted as an imbalanced power relationship between Skills to Survive and Helping Hands which suggested that power rested with Skills to Survive due to their influence on the project's decisions and resources. Likewise, the data shows that an imbalanced power relationship existed between the two organisations and the communities which was seen when one participant was referring to the Kiosks’ design and indicated that they were compelled to accept what was brought to them due to social power dynamics that existed which suggested that power vested on the two organisations. As presented in chapter five, although Helping Hands was a local organisation, its operations were controlled by non-Ugandans (white Americans), suggesting that the design was based on a Global North social and cultural understanding.

… this one mentality that is in us because we have always had it that the mzungu [white person] is ahead of us so we just have to follow them… because if it were any other ordinary Ugandan, I am not sure it would have picked as much…

(Anna, parent, Kiosk A, Interview)

The data also indicates that mobilisation about the project was not sufficient at the community level as some parents did not have awareness and understanding of it.

We were not told about it [the Kiosk]. I only came to know it was there when my children told me about it… I think they [Skills to Survive and Helping Hands] should have told us as parents about its use and how it will benefit our children.

(Tracy, parent, Kiosk A, Interview)

Additionally, as previously indicated (see section 5.1), unlike Kiosk A, there was no discussion with the community at Kiosk B on an appropriate location for the Kiosk to be placed.

…You see the [Kiosk B] needs to be moved to a more secure place. …we have that problem of insecurity first of all if they can also be able to hear us out and we first tell them what we first need before they hand it to us…

(Jason, adult, Kiosk B, Interview)

In reflecting on the process undertaken to establish Kiosk B, Karen, Skills to Survive representative acknowledged the assumptions made about this Kiosk were not appropriate. Given that the postulation made about the location of the Kiosk was to make the Kiosk ‘open and accessible to everyone’, the findings presented in chapter six and seven show that was not the case in this context, suggesting that the understanding of ‘open and accessible’ is different for different contexts. This difference in understanding would have been clarified if the context had been analysed through community engagement.
That sort of worries me how much the location matters… we chose that location because we wanted it to be open and accessible to everyone… But I also feel concerned for the future about that because in some places where it's needed most presumably it's not gonna work because of the location…

(Karen, Skills to Survive representative, Interview)

Although a few females participated in Kiosk A's building, the data indicates females had challenges that hindered them from engaging with the Kiosks, as discussed in chapter six. Helping Hands identified that one aspect that contributed to female non-engagement of the Kiosks was because gender dimensions were not considered when the project was introduced to the communities.

…some of the people within the community in terms of gender feel excluded from the project, these are mostly women. […] When we were thinking about it, we didn’t really think in the very beginning how we were going to engage women from the word go.

(Nelson, Helping Hands representative, Interview)

Skills to Survive also acknowledged the project had not focused on how women and girls could be engaged and shared their reflections as:

… I know we got things wrong… But I know it through the things we got wrong like the needs of women and girls in that context that I have been able to learn how to go forward. …we intend to include them in future discussions.

(Karen, Skills to Survive representative, Interview)

The findings presented in chapter six demonstrated how the absence of gender dimensions influenced access and utilisation of the Kiosks and, as a result, undermined the community engagement that was done. However, given the above reflection, it appears that Skills to Survive had learnt lessons, and women and girls will be involved in future project development.

There was also a mismatch in the organisations' expectations of the project and some community members' expectations on community ownership of the Kiosks particularly at Kiosk A where the sentiment of Hillside school management suggested the need to have more authority over the Kiosk, indicating that because it was a communal facility community users did not take care of it which led to the operational challenges. This suggests that Skills to Survive and Helping Hands did not sufficiently understand the complex issues within the context before implementing the project. However, at the same time, the data indicates that the school management wanted to impose more restrictions on community users which suggested that tensions existed between the school and the community users.
…We understand it is for the community but people here in Uganda don’t care, they spoil it. They [Skills to Survive and Helping Hands] should allow us to have control so we can give people guidelines to follow so that people can understand it has ownership and for it to continue working…

(Steve, Hillside school representative, Interview)

The tensions between the school and community users were also evident in the data presented in chapter six. Some teachers had highlighted a specific group of community users who used the Kiosk in the evening put passwords that hindered the school from accessing it during the day. This highlights that a complex relationship existed between the school and community users. On the other hand, the complex issues within the context were more prominent at Kiosk B as participants indicated the Kiosk sustainability issues was because of vandalism.

…mostly challenges were in those people who tamper with the machine.

(Eddie, adult, Kiosk B, Interview)

As presented in the data in section 5.1, discussions on the community leadership occurred after two years of Kiosk A’s existence, which suggests this was an afterthought. On the other hand, no dialogue on community leadership occurred at Kiosk B. Some participants highlighted the absence of a community leadership system from the beginning of the project contributed to its non-functionality.

…It would have been good when they [Skills to Survive and Helping Hands] brought it to have a group of people in the community to manage people there from the start… In most cases when people fought, it led to the machines getting spoilt and wires were cut at night.

(Jason, adult, Kiosk A, Interview)

Skills to Survive also acknowledged gaps in community leadership when they implemented the project indicating that they had gone far with the process.

…I recognise that there are some gaps that haven’t been filled… but we obviously haven’t gone far enough with that community leadership process…

(Karen, Skills to Survive representative, Interview)

Although community leadership had been established at Kiosk A at the time of this research, the data in chapter six demonstrated complex power dynamics within the committee. For this reason, the committee was not efficient. For example, as indicated earlier (see section 6.2), George, the representative for children at the committee, and other young male users reported that Jason, the committee chairman, hindered their access to the Kiosk. However, it seemed that addressing Jason's behaviour became difficult.
since he protected female committee members from physical violence by other adult male users. Additionally, he was the only adult male committee member. Considering the gender dynamics within the social and cultural context, this may have made it difficult for the other committee members (who were all females) from removing him from the committee.

... [Jason] has been helpful in this instance because some people wanted to fight us, and he protected us from them.

(Ms. Elaine, teacher, Kiosk A, committee member, FGD)

However, participants at Kiosk A indicated that even with the committee's existence, community users did not respect the guidelines provided by committee members as there were no consequences for not following the guiding principles provided.

…We need someone to put force for some people because some people need force. But if you just talk talk, some of them don’t care, talking what are you going to do to me… he knows you will do nothing.

(Ms. Elaine, teacher, Kiosk A, committee member, Interview)

Contradictions existed in the data regarding what was meant by local ownership to the low-income communities of this PhD research. The Kiosk committee was seen as a way of strengthening local ownership. However, many participants who took part in the stakeholder focus group for Kiosk A highlighted that the committee needed to enforce consequences for not following guidelines. This would be through a local higher authority who would exercise their power to ensure users respected the regulations set by the committee.

I also feel the committees have no authority so having these committees attached to the local councils. Because people will understand that this committee has powers because they come from the local council, and they have a right to take you to a bigger authority if they find you breaking anything…

(Nelson, Helping Hands representative, FGD)

For me I think it’s better to talk to the police because it is easier to get hold of the police faster than the local council…

(Tim, adult, Kiosk A, FGD)

The data presented in this section highlighted five gaps within the stakeholder engagement that contributed to the sustainability issues the Kiosks faced.

- The first identified issue was the power dynamics at the organisational and community level, which limited the local partner and communities' ability to influence the Kiosks' design.
• The second issue was the inefficient community engagement, particularly with the community at Kiosk B. Besides, some parents at Kiosk A indicated not having the awareness and understanding of the project.
• The third issue was the absence of gender dynamics in the project's design, and implementation, which hindered sustainability as women and girls' needs within this context were not known.
• A fourth issue was the mismatch between the organisations' expectations and community expectations.
• Finally, there were no early discussions on how communities would manage the Kiosks and no leadership appointment. As a result of this, there was no community ownership at Kiosk B, and there were complex power dynamics within Kiosk A committee.

The discussion section will explore these issues together with steps to address them. The following section presents data on aspects related to technological design and maintenance.

8.2. Technological Design and Maintenance

The Kiosks' design made them susceptible to vandalism as it was easy for parts to be removed. Most participants at both Kiosks highlighted the hanging open wires and switch could be easily pulled, affecting the electric current and, as a result, contributed to the Kiosk's consistent breakdowns.

...young children from five years old going down come to spoilt it. They come and pull the wire; they switch it off when we are using it. So, the last time they switched it off and it refused running because they pulled the wires.

(Irving 12, in-school boy, Kiosk B, Interview)

... another issue is about the community you know some people are good, others are not serious at all. So, there are those who came and wanted to see how it’s functioning and ended up pulling some wires and the wires were burnt...

(Ms. Jessica, teacher, Kiosk A, Interview)

The hanging wires also paused the danger of users becoming electrocuted.

...some wires are not insulated; the small wires and they may shock some people when we are using it.

(Mathew 13, in-school boy, Kiosk A, Interview)

In reflecting on the Kiosks' design, Skills to Survive stated that they chose that design because they wanted to scale the project to various locations, which suggests the focus was on quantity over quality to achieve rapid, tangible results.
The first [Kiosk] was in Nigeria and it was a much better design and was working for five years… We changed the design because we wanted to build more [Kiosks] but actually we made it less effective.

(Karen, Skills to Survive representative, Interview)

Some participants made recommendations on how the design could be improved to mitigate the challenge of wires being pulled and switch that could be easily accessed by young children.

I mean it needs to be enclosed when every wire is inside so that no one can pull the wires.

(Mathew 13, in-school boy, Kiosk A, FGD)

Adding on that I would say having the switch in an enclosed place because some young children play with the switch.

(Ms. Jane, teacher, Kiosk A, FGD)

As indicated in the previous section, theft was a challenge that the community was already facing, and the Kiosks’ design and absence of security exacerbated this issue. Although the intention of Skills to Survive was to make them open and accessible, the data shows that the design did not fit with the reality of this context. Most participants at both Kiosks noted that the non-functionality was because of the equipment being stolen.

… they keep stealing wires from that computer that is why it is getting spoilt.

(Liam, 16, in-school boy, Kiosk A, Interview)

… But why do they not get someone to guard that [Kiosk] because people steal so many things. People from the community, they steal wires and speakers. There are so many things missing.

(Salim, 14, out-of-school boy, Kiosk B, Interview)

This shows that provision of ICT without understanding and addressing the challenges that could hinder its functionality within the communities limits its chances of surviving in that community.

The data shows that routine maintenance of the Kiosks was not built into the project’s schedule as participants reported facing constraints due to the consistent breakdowns and prolonged periods before the faulty equipment at the Kiosks were replaced. This absence of routine maintenance hindered the Kiosks’ functioning and is linked to the equipment for the Kiosk not being locally available, as will be seen in the data below.

…The other problem is they take very long before they come to repair it. It has now not been working for almost a year now.

(Irving, 12, in-school boy, Kiosk B, Interview)
It is the frequent breakdown and poor maintenance.

*(Tim, adult, Kiosk A, FGD)*

The data shows that the absence of routine maintenance was because the materials used in building the Kiosks were not locally available, which meant when the Kiosks broke or something required replacement, it took a considerable amount of time to arrive in Uganda since Skills to Survive purchased them internationally. This shows that the design was not adapted to suit the local context since the hardware and software to replace broken parts were not locally available.

…It’s so hard to get spare parts for the [Kiosk] anywhere here in Uganda. And the fact that we have to order it from China, or UK or the US, it takes time for them to get into the country. That is one of the main reason to why we have this continuous breakdown.

*(Nelson, Helping Hands representative, FGD)*

There was also no technical training done for the community to minimise their dependence on Helping Hands for every minor technical issue the Kiosks faced.

But the big problem we are having is for us we don’t know the thing, if it gets a problem, we have to call because none of us can repair it.

*(Tim, adult, Kiosk A, FGD)*

Some participants stated that some users tried to repair the Kiosks. However, since they did not have the technical knowledge, their efforts caused more harm than good.

…we found it difficult because everybody wants to fix it when they don’t know how to…

*(Ms. Jane, teacher, Kiosk A, FGD)*

…they were just trying to put it on such that it works again. Then they end up spoiling…

*(Ms. Elaine, teacher, Kiosk A, FGD)*

Although the representative from Helping Hands showed interest to train someone within the community who would become the technical person, the inaccessibility of all equipment parts locally caused a challenge for intensive training to occur.

…it is better to train someone when every equipment is on the ground so that it involves turning the whole [Kiosk] upside down and showing this person where every single piece was going to. But then unfortunately, we didn’t get all the equipment, so the training was more of a theory than the practical bit.

*(Nelson, Helping Hands representative, FGD)*
Participants also raised concerns about the communities' inability to maintain the Kiosks in the long-term as the materials used were not locally available, suggesting that the Kiosks needed to be adapted to suit the needs of the local context for them to be sustainable.

…I’ve heard that they are planning to handover to us. [...] firstly, we don’t have spares of the [Kiosk] when it gets a problem we can work on. I think when they hand over to us it will be a challenge to us it except when they are still helping us because where will we get the materials...

(Ms. Jane, teacher, Kiosk A, Interview)

Finally, the absence of a reliable Internet supply also paused a challenge for the sustainability of the Kiosks. As noted earlier in section 5.1, the agreement between the two organisations and the Internet provider was to deliver Internet access to the Kiosks for free in accordance with their Corporate Social Responsibility guidelines. However, both the users and the representative from Helping Hands highlighted the provision was unreliable, which left some users feeling frustrated.

…the partners that are working with the [Kiosks] for instance [One Net] agreed to provide the Internet at no cost. But all over sudden sometimes they call off the partnership without us the community knowing and then at the end of the day we are wondering what is happening. Or if they are not calling off the partnership, the aspect of the internet being reliable in the sense that it is available all the time is not true. We have technical issues, and we constantly have to look for someone from [One Net] to sort it out.

(Nelson, Helping Hands representative, FGD)

…I don’t know it [Internet] used to get spoilt, when I go, they say now it requires technical check-up…

(Larry, adult, Kiosk A, Interview)

The findings in this section reveals two critical factors that hindered the Kiosks' sustainability; the poor design made the Kiosks susceptible to theft and vandalism and, the lack of routine maintenance. As indicated above, the rationale behind this design was to build more Kiosks. However, as the data shows, this focus resulted in the Kiosks not being fit for the context leading to their inefficiency. Since the design was not adapted to the context, the materials used were not locally available, and as a result, the Kiosks lacked regular maintenance. Due to the unavailability of equipment locally, it took prolonged periods before the Kiosks were repaired due to the long duration it took for the materials to arrive in the country. Additionally, the local communities were not equipped with technical skills to repair the Kiosks to reduce their dependence on Helping Hands.
These findings, together with recommendations for the next steps forward, are discussed in the next section. The suggestions provided in this chapter will also support other failed CTC interventions in similar low-income communities in Sub-Saharan Africa.

8.3. Discussion

The findings presented in this chapter identify two interrelated dimensions crucial to promoting sustainability of the Kiosks; stakeholder engagement and technological design and maintenance. These findings draw on the prepositions of the sociocultural lens framing this research to understand these aspects in relation to the processes undertaken in the design, planning, implementation, and maintenance of the Kiosks. The data presented shows that the context was not sufficiently understood before the project was designed since Skills to Survive involved Helping Hands at the implementation stage. Helping Hands was brought on board to specifically conduct activities related to the implementation, such as mobilising the communities, organising logistics and building the Kiosks. These findings show that the relationship between Skills to Survive and Helping Hands was unequal since a top-down approach was used in introducing the project rather than both parties collaboratively contributing to its development. Due to this, the data shows little room existed for Helping Hands to influence the design of the Kiosks which led to an asymmetrical partnership as power rested with Skills to Survive. This was because the project design was not a collaborative effort since Skills to Survive designed it and obtained funding before involving Helping Hands. For sustainability to be promoted, these findings suggest a need to improve the relationship between the two organisations where the asymmetrical power relations are reduced. This can be done through adopting postcolonial methodologies where the local organisation i.e., Helping Hands, are involved in the initial project conception phase rather than at the implementation phase. This approach will enable Helping Hands to contribute towards the project development and decision-making processes, thereby encouraging ownership and minimising the power dynamics as the local organisation is involved right from the beginning of the project. Additionally, a local understanding of the context will be gained by engaging with the local organisation early and incorporating the social and cultural aspects into the project design.

The data presented in this chapter also shows that an asymmetrical relationship existed between the two organisations and the communities. However, the power imbalance between Helping Hands and the local communities was slightly less than Skills to Survive because they already had a relationship with the communities and were rooted within the context. The literature highlights that local organisations have
a higher chance of achieving the project's objectives than international organisations due to the existing relationships with the communities (see for example, Hayes and Westrup, 2014). However, as indicated above, Helping Hands was not involved in the initial project conception and could not influence the project's decisions since a top-down approach was adopted where Skills to Survive influenced most decisions. Due to these power dynamics, existing complexities within the context were not sufficiently understood and as a result the project failed. Chipidza and Leidner (2019) argue that international organisations' decision to include or exclude local partners and communities in the project's design impacts their voice to influence the intervention. When local stakeholders are involved in the design, their voices are amplified, and when they are not, their opinions are not taken into account which impacts the project's success. This chapter's findings add that a sense of ownership and responsibility is also built when local stakeholders are involved in designing the project as they feel they took part in developing it.

In the case of the Kiosks, a postcolonial participatory approach could be applied where the project is co-designed with the local communities to amplify the communities' voices and encourage ownership as the communities will feel they contributed to the development of the project. As indicated in the literature, this approach raises awareness and improves understanding between the cultures involved (Winschiers-Theophilus et al., 2019) and as a result the existing complexities within the context are recognised and considered in the project design. Despite the gaps in stakeholder engagement, the data from Kiosk A shows that the community took responsibility for the Kiosk. To increase ownership and promote sustainability, Skills to Survive could use the findings in this chapter to inform a postcolonial/decolonising participatory approach through collaborative workshops with Helping Hands and different stakeholders within the local communities where ideas for improvement of the Kiosks are collaboratively formulated. As cited in the literature Zavala (2013) explains that decolonisation is more about amplifying the communities' voices by providing them with a space to share their knowledge and experiences. This will improve understanding between the Skills to Survive and Helping Hands and the organisations with the communities as contextual issues will be considered. The proposed Context Complexities framework presented in the next section provides procedures for how this could be implemented in practice.

The findings in this chapter also highlight that a critical component that was overlooked in the project design and implementation was the gender dynamics within the context and how gender aspects would affect the project's success. The literature in sub-section 2.1.1 highlighted several structural issues that
hinder women and girls' use of CTCs. Furthermore, the data in chapter six demonstrated the specific challenges female users encountered within this context that impeded their access and utilisation of the Kiosks. As presented in this chapter, both Skills to Survive and Helping Hands acknowledged that gender was not incorporated in the project design. This data shows that part of the reason for the challenges women and girls faced was because gender aspects were not put at the forefront of the design and implementation of the project. The findings in this PhD suggests the need to adopt gender-sensitive approaches in designing and implementing CTCs, such as establishing measures that assure females' safety and comfort to encourage their access. In the case of the Kiosks, this would involve seeking opinions from women and girls at Kiosk B on where it would be appropriate to place the Kiosk for them to engage with it. The findings also suggest a need to consider having security that will guarantee female safety.

Although the project incorporated community engagement during its implementation, the data shows gaps in the process as the approach undertaken for the two locations was different. While there were discussions with the community at Kiosk A regarding its location, the decision made for Kiosk B’s site was based on assumptions that everyone would be able to access it since it was in a public space. However, the data shows that the postulation Skills to Survive had about making the Kiosks open and accessible did not match with the reality of the context. Due to its location, the frequent technical issues Kiosk B faced compared to Kiosk A were caused by the existing theft issues within the context.

The data also shows gaps existed in the community engagement at Kiosk A as some parents indicated they were not involved and did not have the awareness and understanding of the project. This explains why some parents were hesitant about their children using the Kiosks, as discussed in chapter six. This finding demonstrates that parents' involvement was vital in determining the project's success due to the critical role in influencing their children's activities. It echoes the conclusion of studies (such as Mthoko and Khene, 2018; Lorini et al., 2019) on how social sustainability can be developed, emphasising the importance of involving all community groups throughout the project cycle. These findings add depth to this discussion by highlighting that when the voices of all community groups are incorporated in the design to ensure their needs are considered, trust is built. This increases the chance of the project succeeding, and when they are not, trust in the project is lowered, which affects engagement with the intervention.
Community leadership was another critical aspect that was not incorporated from the beginning in the project design and implementation. The data presented in this chapter and previous chapters demonstrate that most of the complex issues encountered at the Kiosks were due to the absence of strong leadership, which affected users' access, impact, and sustainability. These findings demonstrate that providing access to ICT through CTCs was not enough without understanding the complex issues within the context from the communities' perspective and embedding measures within the design to bridge them. As presented in this chapter and previous chapters, the existing complex issues within the context were exacerbated by the Kiosks existence because power dynamics and social and cultural factors were not sufficiently understood. For instance, if Skills to Survive and Helping Hands had embedded in the initial plan how the different groups would access the Kiosks and established a strong community leadership from the beginning, this would mitigate some of the challenges. However, since the complex social and cultural details of the communities involved were not incorporated in the design, the project failed.

Given the power dynamics and different stakeholder relationships discussed above, the data indicates that partnering with a local organisation is not enough to understand these complex issues. These findings propose the need to learn from the communities and value their knowledge and experiences through the postcolonial/decolonising approach discussed in the literature (see section 2.7) to understand the communities' expectations and get into the deep-rooted problems embedded within the context. Through this process, Skills to Survive and Helping Hands can understand the communities' perspective and share the project's objectives, which will bridge the expectation gap. This process should also involve having the communities collaboratively select potential leaders to represent each stakeholder group during these initial meetings while considering the gender and age aspects. These would form the community leadership that would assist in managing the complex issues users faced to achieve organisational sustainability promoting equitable access and long-term existence of the project.

The data on technological design and maintenance shows that the design of the Kiosks made them susceptible to vandalism and theft as it was easy for parts to be removed. As presented in chapter five, the Kiosks' design was informed by the initial pilot Kiosk Skills to Survive built in Nigeria. However, the data shows this design was modified for it to be scaled to different locations and, as a result, became inefficient. Since the design was developed before engagement with the local organisation and communities, it was clear that Skills to Survive did not conduct any prior assessment of the context. This approach led to the widespread problem Heeks (2002) described as the design-actuality gap most ICTD
interventions face. It was evident that there was a wide gap between the Kiosks' design and the local reality since the materials used were not locally available. When equipment parts became faulty, they had to be internationally purchased, which took extended periods to arrive in the country. This affected the Kiosks' maintenance and repair, and as a result, it took prolonged periods before the Kiosks were repaired, which severely inconvenienced users.

Besides, the design was poor as wires were hanging (see figures 5.3 and 5.5), and due to this, participants noted that the wires were easily pulled, which affected the electric current. Additionally, the hanging wires paused the danger of users becoming electrocuted. The data shows that Skills to Survive chose that specific design in the quest to scale the project. Scaling before assessing impact has been cited in the literature (e.g., Baduza and Khene, 2015; 2019) as a frequent problem hindering the sustainability of many ICTD projects. All the four Kiosks were simultaneously built with no prior piloting, and due to this approach, there was no data to inform the appropriateness of the design for the context. It was not clear why a pilot was not conducted as this would have facilitated feedback from the communities, which would have informed improvement of the design. As a result, the Kiosks faced the same technological sustainability challenges. A more appropriate approach would have been to test the design, monitor progress and impact before scaling. The findings in this chapter propose for Skills to Survive to co-design the Kiosks with Helping Hands and the communities through postcolonial participatory design workshops where the input of different user groups is sought.

However, before any engagement with the communities, these findings suggest Skills to Survive and Helping Hands to initially work with locally based engineers to develop some rapid design prototypes with locally available materials, which will be used as demos. These could be presented in both multimedia format and printed versions during the workshops. Bon et al (2016) highlight that demos provide communities with an idea of ICT designs to elicit discussions. Considering that many people within these low-income communities may not be literate; a short video could also be prepared in the local dialects of the communities to provide a detailed explanation of how each prototype works to facilitate further understanding.

The data also shows that the communities lack of technical skills to repair and maintain the Kiosks was another issue to sustainability. This together with the unavailability of replacement equipment created a further dependence of the communities on Helping Hands for all minor repairs, thereby limiting the social
and technological sustainability of the Kiosks. As indicated above, the findings suggest the Kiosks to be redesigned with the communities using locally available materials. These findings also propose for the low-income communities to be provided with technical training to repair the Kiosks. This will increase community ownership of the Kiosks and minimise dependence on Helping Hands. The findings in this PhD research also suggest consideration for other approaches such as the provision of some mobile devices, such as tablets, preferably solar-powered ones to minimise the challenges with recharging them given the unreliable electricity supply (as described in chapter five). These tablets could be used by girls and young people in small groups (in consideration of age groups) with supervision and kept with caretakers within the communities to mitigate the risk of the tablets being stolen. This could minimise some of the structural barriers and resource constraints that were present at the Kiosks.

The data presented in this chapter and previous chapters informed the development of the proposed Context Complexities framework, which resulted from the data analysis. The following section presents the Context Complexities framework and describes how it could be used as a tool to facilitate the postcolonial participatory approach.

8.4. Proposed Context Complexities Framework

As explained in chapter four, the Context Complexities framework was developed from the data that emerged on complexities that affected usage, impact, and sustainability. The data extracts that formed the foundation of the proposed framework emerged from the following codes: social barriers, domestic responsibilities, attitudes and support, school restrictions, limited ICT skills, security concerns, resource constraint, connectivity and operation, pornography, social vices, community leadership, power asymmetry, involvement, expectations, design constraint, theft and vandalism, maintenance constraint and unreliable internet. Three core aspects emerged from the analysis of the data extracts which became the three key components of the proposed framework as follows:

- Co-creation with stakeholders (social, financial, and organisational sustainability)
- Localisation of design (technological and social sustainability)
- Nurture local community ownership (organisational sustainability)

As discussed earlier the proposed Context Complexities Framework was informed by the postcolonial/decolonising participatory design in the literature (such as Loi et al., 2018; Winschiers-Theophilus et al., 2019) and the postcolonial lens embedded in the theoretical framing of this PhD which
examines the power relations. These foreground the importance of incorporating culture into the design and adopting ethical strategies that focus on the communities' social realities. The proposed Context Complexities Framework aims to guide operations in the design, implementation, and evaluation of CTCs in low-income communities. The possible actions for each component to ensure culture and ethical practices are incorporated in the design, implementation and evaluation of CTCs are discussed after the figure below. Skills to Survive and Helping Hands could adopt the proposed Context Complexities Framework to redress the situation and rebuild a relationship with the local communities.
Figure 8.1: Proposed Context Complexities Framework

- **Start**: Ongoing/large scale project
- **Step**: Long-term financial sustainability through local sponsors
- **Process Evaluation**: Review and improve
- **Impact Evaluation**: Monitor and evaluate
- **Process Evaluation**: Promote equitable access through local community leadership
- **Process Evaluation**: Nurture Ownership through community leadership
- **Process Evaluation**: Build Community Technology Centre with local materials
- **Process Evaluation**: Localisation of design
- **Build for social, technological, financial and organisational sustainability**
- **Process Evaluation**: Understand the local context in depth
- **Process Evaluation**: Address context complexities
- **Process Evaluation**: Co-create design with stakeholders (iterative process)
8.4.1. Co-create Design with stakeholders

This phase begins with identifying all relevant stakeholders and ensuring that the different groups are equally represented, including children, women and girls, and people with disabilities. It also involves building trust with the various stakeholders and engaging with them in a way that suits them to encourage contribution to the participatory design activities. The first engagement could be segregated participatory design workshops with the individual stakeholder groups to understand each group’s needs, the social and cultural complexities each group faces and obtaining their views on how these complexities could be addressed. Taking this approach encourages equal expression of opinions from the different groups and would enable CTC practitioners to understand the power relationships between the different groups. The participatory design workshops could be concluded with CTC practitioners sharing with the various stakeholder groups what they heard to ensure that the information gathered is accurate and participants views are not misunderstood. This would encourage ongoing discussions between CTC practitioners and the different stakeholder groups, thereby nurturing trust, mutual understanding, and learning.

Once the initial engagement with the respective stakeholders has been done, CTC practitioners could conduct another workshop bringing together the different stakeholder groups where they share the ideas acquired from the individual stakeholder workshops. During this workshop, CTC practitioners could present some design prototypes to encourage discussion and communication between the various stakeholder groups. The workshop could be concluded with a feedback session where CTC practitioners share what they heard from the discussions during the workshops. This phase would also facilitate understanding of how the different groups engage to identify power dynamics between them and enable an in-depth interpretation of the context. This also minimises the power imbalances between the designers and the communities as indicated in the literature (see Bannon and Ehn, 2013).

Another aspect that needs to be discussed during the participatory design workshops is how impact will be monitored and establishing measures that suit the local context to evaluate impact. Audio recording all workshop activities is essential throughout this process to facilitate analysis of all the data gathered. CTC practitioners could conduct a final mapping exercise where the themes from the workshops are identified. The last stage of this phase involves a feedback session where all stakeholder groups are brought together and informed of the outcome from the mapping exercise and the next steps to be taken based on the themes that emerged.
CTC practitioners could also establish measures for long-term financial sustainability at this phase for example, building relationships with local sponsors and sharing progress reports with them when the CTC has been established.

**8.4.2. Localisation of design**

The data presented in this PhD research has demonstrated that having the CTC design adapted to the local context is key to sustainability. As discussed earlier, this involves doing prior research on locally available materials that could be used for the CTCs and working with local engineers to develop prototypes. The data from the co-creation workshops should inform a context-specific approach. For example, in the context of the examined Kiosks, a context-specific design would include having measures within the plan that promote different user groups to have access. For example, incorporating mobile devices such as tablets could encourage more people to access the CTC, particularly young people, and female users. The final step involves building the CTC with the communities based on the prototype that was agreed on in the co-creation workshops. Additionally, establishing a maintenance strategy and providing the local communities with training on how to repair the CTCs is essential.

**8.4.3. Nurture ownership with local community leadership**

Co-creation with stakeholders above will encourage local ownership as the different stakeholders were involved in the initial participatory design activities. This phase involves encouraging the local communities to select leaders that will represent the different stakeholder groups to ensure equitable access. Ensuring the leadership has equal representation of various stakeholders and discussing how the voices of the different groups are represented in the leadership team is key to this process. It also involves having the community leadership team to establish how they would be able to work cohesively in practice. For example, this could involve having them establish a set of strategies to guide their leadership including having regular check-in meetings to measure progress and review processes.
8.5. Summary

The findings reported in this chapter highlighted two interrelated aspects crucial to promoting sustainability of CTC interventions encompassing stakeholder engagement and technological design. Due to the asymmetrical power relationship between the two organisations and communities, the data shows the context was not sufficiently understood, which led to gaps between the technology design and implementation and the local reality. Several suggestions on how the power dynamics could be minimised to encourage ownership were provided.

Additionally, the findings in this chapter show that gender aspects were not incorporated in the design and implementation, which contributed to issues women and girls faced that were discussed in chapter six. Therefore, the findings in this chapter emphasises the need to adopt gender-sensitive approaches in designing and implementing CTCs, such as establishing measures that assure females' safety and comfort to encourage their access.

The findings in this chapter also shows that the technological design made the Kiosks susceptible to vandalism and theft as it was easy for parts to be removed. Additionally, the absence of maintenance routines also paused another problem as it took prolonged durations before the Kiosks were repaired due to the unavailability of equipment locally. The proposed Context Complexities framework, which was an outcome of this research's data analysis, provides guidelines on how processes involved in CTC design and implementation could be improved. The three components for the proposed framework provide a basis for how CTC practitioners in low-income communities could consider communities as partners in the design and implementation of CTCs. The concluding chapter that follows draws together the findings of this PhD and extends the insights of the conclusions of chapters five to eight, including identification of areas that need further exploration.
Chapter 9: Conclusion

This PhD aimed to understand the contextual factors that influenced access and utilisation of the Kiosks in the two urban low-income communities. The literature reviewed identified challenges people, particularly women and girls, face in low-income communities in accessing ICT and CTCs in particular. The findings in chapter six expanded on this discussion by demonstrating how complexities related to gender, age, and social structures influenced the access and utilisation of the Kiosks. The data showed that the social and cultural norms within these urban low-income communities were an enabler to males and a barrier to female access and utilisation of the Kiosks. Females in these urban low-income communities were expected to stay at home and contribute towards the larger share of domestic responsibilities which took most of their time, leaving them with little flexible time to utilise the Kiosks. On the other hand, males did not have these restrictions and could use the Kiosks more flexibly. This data indicates that males were better positioned to utilise the Kiosks compared to female users due to the social and cultural norms. These restrictions influenced the level of engagement females had with the Kiosks and, as a result, limiting level of the impact the Kiosks had on them. These findings suggest that CTC practitioners, in this case, Skills to Survive and Helping Hands need to understand the social and cultural aspects embedded within the context from the low-income communities perspective. It emphasises engaging with different stakeholders, i.e., both men and women, through a postcolonial participatory approach and formulating solutions that would address these issues as recommended in chapter eight. Additionally, local representatives such as the committee members of Kiosk A could be involved in conducting community awareness campaigns on providing supportive environments that encourage women and girls' empowerment.

Besides the social and cultural restrictions, the data showed that the location and organisation at the Kiosks influenced female access and usage. The data indicated that female users were more comfortable engaging with Kiosk A during the female-only time when supervision was available to guarantee their access. On the other hand, the lack of female engagement with Kiosk B was because they did not feel safe due to male dominance at the Kiosk. The data in chapter eight demonstrated that gender aspects were not at the forefront of the design and implementation, contributing to this low female engagement with the Kiosks. These findings indicate the importance of incorporating gender in project planning and lifecycle and suggests the need to adopt gender-sensitive approaches in designing and implementing CTCs, such as establishing measures that assure females' safety and comfort to encourage their access.
As suggested in chapter eight, taking a postcolonial participatory approach would facilitate understanding of the needs of women and girls in this context.

The findings also indicated that age and gender determined who would access the Kiosks. The data showed that older users, particularly males hindered younger users and females from accessing the Kiosks. This finding suggests the need to understand the requirements for different user groups and incorporate measures that would promote equitable access. As indicated in chapter eight, this could be done through a postcolonial participatory approach where CTC practitioners, in this case, Skills to Survive and Helping Hands, engage with the different stakeholders to understand their needs.

The findings also indicated that the availability and operational functioning of the Kiosks influenced their access and usage. Users noted that due to the Kiosks being always overcrowded, their access was limited. This finding suggests that one Kiosk with only two computers was not enough to cater for the large population that utilised them, which implied that part of the reason that contributed to the structural barriers was the resource constraint. Additionally, the operational challenges the Kiosks faced limited users access. The data showed that due to the poor design of the Kiosks which made them susceptible to vandalism and theft, and absence of routine maintenance, the Kiosks consistently faced operational challenges which limited their usage. The data showed that the lack of regular maintenance was attributed to the unavailability of spare part materials within the local context. When equipment parts became faulty, they had to be internationally purchased, which took extended periods to arrive in Uganda. As a result, it took prolonged periods before the Kiosks were repaired. Additionally, the data showed that the local communities were not provided training on repairing the Kiosks and always depended on Helping Hands for minor technical issues. As a result, these challenges severely inconvenienced users access and utilisation of the Kiosks.

This PhD research aimed to understand the perceptions of the impact of the Kiosks, a CTC intervention on young people and adults in two low-income communities in Uganda. The literature identified gaps in the education system in Uganda caused by the lack of basic infrastructure and learning resources. The findings in chapter seven demonstrated how the Kiosks supported young people enrolled in school in understanding their school topics, particularly science and mathematics concepts. Many young people noted that they struggled to comprehend concepts in biology and chemistry due to the educational resource constraint and highlighted the Kiosks enabled them to understand these concepts through the
online media resources accessed at the Kiosks. As a result, the data shows that the Kiosks positively influenced young people's school performance. The findings also indicated that Kiosk A supported teachers at Hillside school with their teaching by providing them with access to online educational content and enabled them to illustrate concepts they taught in class. These findings demonstrated that the Kiosks helped bridge the educational resource constraints discussed in the literature in these urban low-income communities.

The literature further identified a gap in soft skills development in the education curriculum in Uganda, highlighting that the curriculum does not equip young people with the skills required to navigate life’s challenges. The findings in chapter seven indicated that the Kiosks, a non-formal learning context, helped bridge this gap by supporting young people to develop various soft skills, including leadership, collaboration, interpersonal and problem-solving skills, and self-belief and confidence. The findings in this PhD provide evidence on how low-income communities in Uganda can be supported to acquire soft skills. The results further showed how the Kiosks supported young people who were not enrolled in school to engage with content in the formal education curriculum they felt were relevant to their life context. This data suggests that the education curriculum in Uganda is not well aligned with the skills needed to address challenges encountered outside school, a finding that aligned with previous studies. This data adds depth to the literature focusing on how ICT could be used in non-formal contexts to support out-of-school children by demonstrating how they engaged with ICT to support their learning. This evidence demonstrates how a practical approach that focuses on individual needs can help them acquire relevant knowledge for their daily activities.

The literature identified the challenges low-income communities in Uganda face and indicated they did not have opportunities to improve their quality of life. The findings in chapter seven demonstrated how the Kiosks supported adults to acquire knowledge that enabled them to create income generation opportunities that helped them to improve their quality of life. Adult users of the Kiosks who owned small-scale businesses noted the knowledge they gained from the Kiosks enabled them to generate more revenue. Others reported starting small-scale businesses, and some other users indicated obtaining employment opportunities and financial gain via the Kiosks. These findings suggest that when low-income communities are provided with resources, they can create opportunities to improve their livelihood, thereby influencing their quality of life. The results also showed that the impact of the Kiosks
went beyond the users and benefitted the broader community as young people shared the knowledge they acquired with peers, teachers, and their families.

The findings in this PhD also demonstrated that the Kiosks were vital social spaces where all users fostered social ties with their community through their interactions at the Kiosks. Many young people noted they had made new friends at the Kiosks, and some of them indicated Kiosk A, in particular, nurtured their sense of belonging in the community. Many young people linked this to the Kiosks' collaborative nature. They shared a computer and developed a peer learning process to address a question and assisted each other in using the computer. These findings contribute to the anecdotal data in the literature that indicated CTCs offer low-income communities with social spaces where individual and community needs are addressed. It expands on this discussion by demonstrating how peer learning at the Kiosks by young people enabled them to develop collaborative and interpersonal skills. It also shows how the Kiosks provided many users with an opportunity to build online connections and relationships that afforded them new learning opportunities, better communication, and new income possibilities, all of which influenced their quality of life.

However, despite these social benefits of the Kiosks, the findings also indicated that there were structural aspects within the social and cultural context in these low-income communities that systematically favoured some groups to utilise the Kiosks while limiting others from accessing them. The data indicated different groups encountered bullying and harassment from other users. For instance, young males indicated adult men hindered them from using the Kiosks, and younger boys and girls noted they were restricted from using the Kiosks by older boys. This finding suggested that the Kiosks represented both spaces for some users depending on the time they used them and who was present at the Kiosks.

Despite the opportunities that come with ICT adoption, the literature identified limitations with ICT, explicitly indicating the potential of children encountering negative online experiences. However, the literature revealed that most of the research in this area was in the Global North, and little data is available on the Global South. Due to the little data available, the literature indicated few interventions exist in the Global South that educates children on negative online experiences. The findings in chapter seven provide evidence on children's negative online experiences in shared public ICT spaces such as the Kiosks in this context. Another limitation associated with the Kiosks was that some adult users of the Kiosks used drugs and alcohol in the presence of children, which caused a concern for children as they
noted those adults became aggressive to them. Additionally, the urban low-income communities were concerned as they felt their children were exposed to negative behaviour that they may see as an aspirational activity to imitate. These findings suggest a need for CTC practitioners, in this case, Skills to Survive and Helping Hands, to work with low-income communities to formulate measures that mitigate the potential negative consequences of CTC establishment and ICT adoption. This can be done through the postcolonial participatory approach suggested in chapter eight using the proposed Context Complexities framework to facilitate the co-creation process.

Finally, this PhD aimed to understand the crucial aspects that were important in promoting the sustainability of the Kiosks and similar CTC interventions in low-income contexts. A key factor identified in the literature that contributes to the sustainability of ICTD, including CTC interventions, is the mismatch between the design and reality of the context. The findings in chapter eight identified stakeholder engagement and technological design and maintenance as the two critical components to sustainability. The results demonstrated that these two aspects were influenced by age, gender, and power dynamics between different stakeholders. The findings showed that due to the power imbalance between Skills to Survive, Helping Hands and the urban low-income communities, there was little input from the communities. As a result, this affected community ownership of the Kiosks, particularly at Kiosk B. The findings suggest adopting a postcolonial participatory design approach to minimise the power imbalance and improve the understanding between different stakeholders. The findings in this PhD led to the development of the proposed Context Complexities framework, a tool that aims to guide CTC design, implementation, and evaluation in low-income communities in Uganda and similar low-income communities in Sub-Saharan Africa.

Overall, the findings in this PhD thesis demonstrated how social and cultural complexities influenced the access, impact, and sustainability of the Kiosks. These findings emphasise the importance of thoroughly understanding the social and cultural context of the communities where CTCs are implemented to promote equitable access and increase impact and sustainability. Additionally, the familiarity I had with the context provided a comprehensive understanding of the context in relation to these critical aspects. The findings in this PhD were presented to Skills to Survive and informed some processes undertaken to improve the Kiosks. For example, the design of the Kiosks has now been changed, and a gender-specific approach has been adopted. Skills to Survive could use the recommendations in this PhD in alignment
with their mission to bridge the educational resource gap and digital divide to further improve processes at the Kiosks and to further understand the needs of the urban low-income communities.

9.1. Contributions of the Thesis

This PhD thesis sought to provide detailed insights into understanding the enablers and barriers influencing access and utilisation of the Kiosks by different user groups. This thesis contributes to knowledge by stressing that complexities related to gender, age, power, and social structures have a significant implication on how CTCs are accessed and who accesses them. The findings on factors that hindered female engagement with the Kiosks provide an insight into the social and cultural aspects that need to be considered to encourage female engagement with CTCs in low-income communities in Uganda. These findings provide evidence on the elements that need to be considered to promote equitable access to CTCs in low-income communities in Uganda.

This PhD aimed to understand the impact of the Kiosks on young people and adults, a CTC intervention in two low-income communities in Uganda. The findings demonstrated that the location of CTCs played a crucial role in determining young people's access and level of engagement with them, which influenced the degree of impact on their learning. These findings contribute to knowledge by informing CTC practitioners and implementers on aspects to consider that increase the impact of CTCs on young people and their learning. The results also demonstrated how the Kiosks helped bridge the challenges facing education in these low-income communities by providing young people and teachers with educational resources online. Additionally, the findings also indicated the Kiosks supported young people to develop soft skills. These findings contribute to knowledge by providing evidence on how low-income communities in Uganda could be supported to acquire knowledge and skills to facilitate improvement in their quality of life.

Finally, this PhD sought to understand the dynamic factors that influence sustainability of the Kiosks and similar CTC interventions. The findings demonstrated that stakeholder engagement and technological design were two interrelated aspects crucial to sustainability that were influenced by power dynamics between the different stakeholders within the context. The results indicate that partnering with a local organisation is not enough to understand the social and cultural complexities within a context. These
findings contribute to knowledge by providing evidence on why understanding the social and cultural context is key to determining the success of a CTC intervention in Uganda.

The proposed Context Complexities framework, which was an outcome of this PhD data analysis, makes a theoretical contribution and could improve CTC design, implementation, and evaluation processes in low-income communities in Uganda.

### 9.2. Practical Implications

The findings on enablers and barriers to access have a significant implication on understanding how the social and cultural systems determine how CTCs are accessed and who accesses them. These findings suggest that CTC practitioners take a context-specific approach to develop practical measures with the target communities that suit the local context to encourage equitable access. It also calls for the understanding of constraints within the social and cultural context that could hinder women and girls from accessing CTCs and proposes adopting gender-sensitive strategies when designing and implementing CTCs. This includes incorporating measures that guarantee female safety and comfort to promote their access. It also suggests for representatives from the community be involved in ongoing awareness campaigns on supportive environments for women and girls' development.

These findings propose that CTC practitioners consider the diverse aspects that determine access, such as gender, age, population, social and cultural structures when designing CTCs. The findings also suggest providing adequate resources, including considering other techniques such as mobile devices like solar-powered tablets to bridge the resource constraint to encourage equitable access.

By presenting the tangible and intangible impacts of the Kiosks, this PhD provides an in-depth understanding of how CTCs can support individuals and the broader community in low-income communities by enabling them to acquire knowledge that supports them to implement their activities. The findings on how the Kiosks supported young people enrolled in school and teachers provide evidence on how CTCs could help in bridging educational resource constraints. In addition, the findings on how the Kiosks supported out-of-school children to acquire knowledge that was relevant to their daily activities illustrates how a practical approach that focuses on the individual needs of out-of-school children can be adopted to support the acquisition of knowledge pertinent to their everyday experiences. Furthermore, the findings on intangible impacts provide evidence to understand how low-income communities in Uganda could be supported to acquire soft skills.
The evidence in this PhD research has demonstrated how important it is to contextualise the context before rolling an intervention. It has provided insights to understanding design-reality gaps in the context of CTCs to identify the root causes of the sustainability problem through an empirical focus. This knowledge will support future research and projects in developing interventions that embed social and cultural understanding in CTC planning, design, implementation, and evaluation.

The proposed Context Complexities framework developed in this research will benefit CTC practitioners in providing them with a practical tool that will guide the design, implementation, and evaluation of sustainable CTC interventions.

9.4. Limitations of this PhD

While every effort was taken to generate sufficient data for both Kiosks, it became difficult to access enough participants from Kiosk B due to its location and lack of structure. Additionally, no data was available on people with disabilities. This research was also limited in the number of adult users of the Kiosks, particularly females who were not teachers at the school as they were not available. Future research could collect data on people with disabilities and adult female users who are not teachers. Additionally, the focus of this PhD was on the two Kiosks in Central Uganda; future research could collect data on the Kiosks in Western Uganda to draw a comparison between the two geographical locations.

The planning of the case studies and implementation faced limitations in that upon the preliminary study, I found that the Kiosks were non-functional, and it became impossible to observe users using the Kiosks. The Kiosks were also non-functional for the entire period of this research, so this research depended on self-reports. Future research could, where possible, generate observational data to compare the self-reports with the observational data.

While the sociocultural perspective has much to offer, it certainly has some limitations. Although the paradigm provides an explanation to how individuals within a context make sense of the world around them, behave, and acquire new practices, there is little focus on how ideologies and structural systems that stem from colonialism such as institutional systems and policies, race and social class, education level and geographical setting shape the social and cultural context of formerly colonised communities and how these power influences limit the forms of actions individuals can undertake. In the context of this research, adopting a sociocultural perspective that draws upon the ideas from postcolonial
approaches provided an understanding to the influences of colonialism that still linger specifically in relation to power and control and how these came into play in the decision-making processes and interactions between Skills to Survive, Helping Hands and the communities in Uganda. I acknowledge that postcolonialism is not the only critical perspective that could be used to address the limitations of the sociocultural perspective. Critical Race Theory and Feminist theory for example attend to ideologies that function to re-create power hierarchies in relation to race and gender. However, in the context of this PhD, utilising a postcolonial approach was the most suitable perspective as it provides a unique lens to understanding and addressing ideologies rooted in the long history of colonialism and oppression and how these emerge in institutional hierarchies that are based on Eurocentric ways of thinking.

Finally, due to the limitations of a PhD, the proposed Context Complexities Framework was not designed with the community as it was developed as an outcome of the data analysis.

9.5. Future direction for research
The findings in this research highlight several avenues for future work. The results in Chapter seven highlight self-reports on perceived impacts and how the Kiosks supported users to achieve their desired objectives. Intervention studies examining how users use CTCs through observations of users using the computers and data on the interactions that take place at CTCs could be valuable in providing insights into the collaborative nature of CTCs.

This research also suggests further work on stakeholder engagement and power dynamics within the context of CTCs using the postcolonial participatory approach.

Another area of research that could be explored further is examining how CTCs may support out-of-school children in Uganda in acquiring skills necessary for the workforce and enabling them to secure employment.

9.6. Concluding remarks
Writing this section takes me back to a time when I became inspired to do a PhD after my research at the School in the Cloud in India. It shows me the massive transformation that has occurred both personally and professionally. I joined this PhD programme with the assumption that technology is the key to solving the education inequalities in Sub-Saharan Africa. However, as I progressed through this research and learnt through my own journey and finding resources that enabled me to overcome both my personal
and professional challenges, I learnt that it is not just providing the technology. Instead, it is in understanding the needs of the communities being provided with the technology and giving them resources within the technology and their environment that would support self-directed learning to achieve their desired goals. This would help them to improve their quality of life now and their communities by sharing their knowledge and improving processes within their context.
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Khadija A Mohamud The Open University


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Appendices

Appendix I: Pilot-Study Research Instruments and Guides

*Figure 3.3: The Concealed Pen Camera used in the Pilot-Study*

Source: SpyCatcher, 2017

*Figure 10.1: The USB Flash drive recorder*
Observation Guide

I started with briefing the participants again about the research and activities involved. The observation took place in a suitable room with a whiteboard and involved observation of eight students at a time, for one 60-minute session or two 40-minute sessions where it fitted better with their timetable. Participants were asked to solve a complex problem collaboratively on two laptops which I provided them with and asked them to present their solution at the end of the session.

The laptops were placed opposite each other on one big table (two tables were stuck together where a big table was unavailable) facing back to back. Four seats were placed around where each laptop was placed. However, participants were free to adopt a seating arrangement that worked for them. Participants were asked to group themselves in groups of four and each group had access to one laptop.

Groups were free to consult each other, and participants could change groups if they liked. At the end of the exercise, participants were asked to present their findings (the answer to the question) to other students (the other group) and their teacher.

Once the activity started, I took the role of a non-participant observer. Two cameras were used for the observation: a fixed camera built into each laptop and a pen camera which I held. In addition, two digital USB voice recorders were inserted on the laptops for audio recordings.

The main areas of observation were:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Areas of observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaboration</td>
<td>• How participants shared resources within a group or between groups.</td>
</tr>
<tr>
<td></td>
<td>• How participants within a group performed actions together (Joint action)</td>
</tr>
<tr>
<td></td>
<td>• Mutual Planning</td>
</tr>
<tr>
<td></td>
<td>• Group Dynamics: observed monopolisers, withdrawn participants and unprepared participants</td>
</tr>
</tbody>
</table>
| Communication          | • Participants attitude in responding to peers  
|                      | • Participants’ contribution towards advancing the topic: Suggesting ideas, responding to others’ ideas and asking for clarification |
| Reaching a consensus  | • Did participants in a group reach a joint perspective? |
| Information seeking   | • How did participants find the answer to the question given?  
|                      | • Do participants consider bias and/or ignore contradictory information?  
|                      | • How did participants balance information to identify a position?  
|                      | • How did participants scrutinise and analyse information obtained? |
| Motivation and engagement | • Participants’ attention towards the activity. Any disruptive behaviour?  
|                      | • Were participants displaying appropriate non-verbal cues?  
|                      | • Were participants actively taking part in the discussion linked to the activity?  
|                      | • Were groups helping each other? |
Focus Groups Guide

I conducted focus groups with participant students in their respective groups after the research activity. The focus groups took place in a quiet location familiar to the participants. Focus group questions were semi-structured, and the key areas of discussion included how students went about solving the problem. Each session lasted for approximately 45 to 60 minutes and was audio recorded to capture discussions on participants’ subjective perspectives of the collaborative self-organised learning environment. In addition, I took field notes of important contextual information.

Guiding Questions

- Describe what you found in your research solving the question provided.
- What did you like or not like about the activity?
- Did you learn anything new through this activity?
- How did you find working with others?
Appendix II: Pilot-Study Ethical Approval and Research Consent Forms

Human Research Ethics Committee (HREC)

From Dr Louise Westmarland
The Open University Human Research Ethics Committee
Email louise.westmarland@open.ac.uk

Extension (6) 52462
To Khadija Mohamud1

Project title: A pilot-study to investigate interactions amongst Year 7 or 8 students in a collaborative self-organised learning environment

HREC ref HREC/2585/Mohamud1
AMS ref

Memorandum

Date application submitted: 21/05/2017
Date of HREC response: 14/06/2017

This memorandum is to confirm that the research protocol for the above-named research project, as submitted for ethics review, has been given a favourable opinion by the Open University Human Research Ethics Committee.

Please note the following:

1. You are responsible for notifying the HREC immediately of any information received by you, or of which you become aware which would cast doubt on, or alter, any information contained in the original application, or a later amendment which would raise questions about the safety and/or continued conduct of the research.
2. It is essential that any proposed amendments to the research are sent to the HREC for review, so they can be recorded, and a favourable opinion given prior to any changes being implemented (except only in cases of emergency when the welfare of the participant or researcher is or may be effected).

3. Please include your HREC reference number in any documents or correspondence, also any publicity seeking participants or advertising your research, so it is clear that it has been reviewed by HREC and adheres to OU ethics review processes.

4. You are authorised to present this memorandum to outside bodies such as NHS Research Ethics Committees in support of any application for future research clearance. Also, where there is an external ethics review, a copy of the application and outcome should be sent to the HREC.

5. OU research ethics review procedures are fully compliant with the majority of grant awarding bodies and where they exist, their frameworks for research ethics.

6. At the conclusion of your project, by the date you have stated in your application, you are required to provide the Committee with a final report to reflect how the project has progressed, and importantly whether any ethics issues arose and how they were dealt with. A copy of the final report template can be found on the research ethics website - http://www.open.ac.uk/research/ethics/human-research/human-research-ethics-full-review-process-and-proforma#final_report

Best regards

Dr Louise Westmarland
The Open University Human Research Ethics Committee

www.open.ac.uk/research/ethics/

January 2017
Information sheet for potential participant school

Title: A pilot-study to investigate interactions amongst Year 6 pupils in a collaborative self-organised learning environment.

Introduction
My name is Khadija Mohamud, a first year PhD Researcher at The Open University. This project is being supervised by Professor Peter Twining, Dr. Beck Pitt and Dr. Alison Buckler of Open University and Dr. James Stanfield of Newcastle University. I would like to invite you to participate in my pilot-study which will investigate interactions amongst Year 6 pupils in a collaborative self-organised learning environment.

Why am I doing this study?
The study seeks to answer the following research questions:

i. How do groups of Year 6 pupils self-organise to attempt a complex research question in a collaborative self-organised learning environment?

ii. What is the process pupils go through as they attempt the research question?

What are the advantages in your school taking part?
The findings from this study will contribute to existing literature on collaborative learning in a self-organised learning environment. It aims to provide a rich picture on how pupils interact and collaborate in the self-organised learning environment while highlighting pupils’ digital research practices in this environment. I will provide the school with a copy of the final report upon request.
What does the study entail?
This study will involve eight Year 6 pupils chosen by the school. These individuals will be briefed about
the study and will be asked if they would like to take part. Through the school, pupils will be issued with
information sheets and consent forms for themselves and their parent/guardian to seek permission to take
part.

The study will involve observation of eight pupils at a time, for one 60 minute session (or two 40 minute
sessions if that fits in better with their timetable). They will be asked to solve a complex problem
collaboratively and then present their solution at the end of the session. They will have access to two
laptops (which I will provide) between them. I will video and audio record how they go about solving
the problem. Subsequent to this, the group of eight students will take part in a focus group interview,
lasting between 45 to 60 minutes (to fit in with their timetable).

Ethics
The participation of your school is entirely voluntary and pupils participating in this study are free to
withdraw themselves from the study up until before transcription without giving any reason. Pupils’
information will be treated confidentially, and all information will be stored anonymously. All
information appearing in the final report will be anonymous and video recordings will only be used for
this study (including contributing to my PhD thesis and related outputs). Data will be retained for 5 years
and then destroyed.

The research will adhere to the British Educational Research Association’s ethical guidelines and has
been approved by the Open University’s Human Research Ethics Committee (found at:
HREC/2585/Mohamud1).

Risks
There are no risks in participating in this study. If you have any comments or queries with regards to this
study, kindly feel free to contact my supervisor Dr. Alison Buckler at alison.buckler@open.ac.uk.

What happens now?
If your school is willing to take part, please sign the enclosed form.
School Head teacher Consent Form

I understand that my school’s participation in this study will involve:

- Assisting the researcher (Khadija Mohamud) to identify and allow her to access potential participants of the study.

Allowing the researcher (Khadija Mohamud) to:

- Meet with individual students to brief them about the study and seeking their consent in taking part.
- Issue potential participants with participant and parent/guardian information letters and consent forms through potential participants to gain their consent in taking part.
- Use a suitable location to conduct observations and focus groups.
- To video and audio record observations and audio record focus groups.

I understand my school’s participation in this study is entirely voluntary. I understand that the pupils participating in this study are free to withdraw themselves from the study up until before transcription without giving any reason.

I understand that I must keep the identity of all pupils participating in the study confidential.

I understand that the identity of pupils will be treated confidentially by the researcher and that all information will be stored anonymously. All information appearing in the final report will be anonymous and video and audio recordings will only be used for this study (including contributing to my PhD thesis and related outputs). Data will be retained for 5 years and then destroyed.

I understand that I am free to discuss any questions or comments I might have with the researcher’s supervisor.

Would you like to be provided with a copy of the report upon completion of this project?

☐ Yes          ☐ No

I give consent to the researcher (Khadija Mohamud) to proceed with this study under the supervision of her supervisor.
Hi Khadija,

Thanks for emailing.

Your research sounds very interesting.

How is best for you to set a date to be in school? If you want to ring through on Wed 28th, my PA is in school and can help you with a suitable date / time?

Or, you can email a few alternatives, and we will match them to our diary.

I look forward to your visit.

With thanks,
4 July 2017

Dear Parent/Guardian,

My name is Khadija Mohamud, a first year PhD researcher at the Open University. I am conducting a small-scale pilot-study to investigate interactions amongst Year 6 pupils when asked to solve a problem collaboratively. I am writing to request for your son/daughter to take part in the study if he/she wishes to do so.

The study will involve your son/daughter taking part in solving a complex question with other students. This would take place in school. The problem-solving activity will take about 60 minutes. Afterwards your son/daughter will participate in a focus group discussion with three other students for approximately 45-60 minutes. All the above will take place on 14 July 2017. Video and audio recordings will be taken and only be used for this study (including contributing to my PhD thesis and related outputs). Data will be retained for 5 years and then destroyed.

Your son/daughter’s participation in this research is voluntary, he/she is free to withdraw from the study up until before transcription without giving any reason. Your son/daughter’s participation will be treated confidentially, and all information will be kept anonymously, meaning no one will know what your son/daughter said.

This project is being supervised by Professor Peter Twining, Dr. Beck Pitt and Dr. Alison Buckler of Open University and Dr. James Stanfield of Newcastle University. If you have any comments and questions with regards to this study, feel free to contact Dr. Alison Buckler at [email protected]

The research will adhere to the British Educational Research Association’s ethical guidelines and has been approved by the Open University’s Human Research Ethics Committee (found at: HREC/2585/Mohamud1).

Khadija A Mohamud

The Open University
Kindly feel free to contact me if you require more information. I will highly appreciate if you could complete the attached consent form.

Kind Regards,

Khadija Mohamud
PhD Researcher
Parent/Guardian Consent Form

I understand my son/daughter’s participation in this research will involve:

- Taking part in solving a complex question with other students on a shared laptop.
- Taking part in a short focus group with three other students after attempting the research question at a time convenient for them.

I understand that video and audio recordings will be taken and only be used for this study (including contributing to the researcher’s PhD thesis and related outputs). Data will be retained for 5 years and then destroyed. All information will be treated confidentially and stored anonymously and all information in the final report will be anonymous.

I understand that my son/daughter’s participation is entirely voluntary and that he/she can withdraw from the study up until before transcription without giving a reason.

I understand that I am free to discuss any questions or comments I might have with the researcher’s supervisor.

Do you consent to photographic images in which your son/daughter is identifiable being used in the reporting of this research?

Note: The researcher will only implement what you consent to

☐ Yes
☐ No

Would you like to receive a copy of the final report?

☐ Yes
☐ No

I ………………………………………………………………… give consent to Khadija Mohamud (the researcher) to proceed with this study under the supervision of her supervisors.

Parent/Guardian Name: ……………………………………………………………

Signature: ……………………………………………………………

Date: ……………………………………………………………

Name of son/daughter: ……………………………………………………………
Participant Information Sheet

4 July 2017

Dear Participant,

I am conducting a pilot-study that will investigate interactions amongst Year 6 pupils in a collaborative self-organised learning environment. This study aims to provide a detailed picture of how pupils interact and collaborate in the self-organised learning environment while highlighting their digital research practices in this environment.

The study will involve you taking part in solving a complex question with three other students. You will be asked to group yourselves in groups of four. Two groups will take part in this study. Each group will be asked to work around one laptop (which I will provide), you can adopt a seating arrangement that suits you. You are free to consult the other group or change group at any time during the session. At the end of the exercise, you will be asked to present your outcome to the other group and your teacher (if present). You are free to choose one person to present on your behalf or can share tasks amongst yourselves and all present.

There is no one right answer so feel free to present your findings to the best of your ability. This task will take approximately 60 minutes. Afterwards you will participate in a short focus group with your groupmates for approximately 45-60 minutes. The whole exercise will take place on 14th July 2017 from 10:00am to 12:00 noon. You are free to ask me questions at any time.

Video and audio recordings will be taken during observations and audio recordings will be taken during focus groups and will only be used for this study (including contributing to my PhD thesis and related outputs). Data will be retained for 5 years and then destroyed.

Your participation in this research is voluntary, you are free to withdraw from the study up until before transcription without giving a reason. Your participation will be treated confidentially, and all information will be kept anonymously, meaning no information will be traced back to you.

Khadija A Mohamud

The Open University
If you think of any questions you would like to ask me once I have gone, you can contact me via email at [email protected]. If you would like to withdraw your data, this can be arranged by contacting me at any time while conducting the study.

Kind Regards,

Khadija Mohamud

Researcher
Participant Consent Form

As an informed participant of this study, I understand that:

- My participation is voluntary, and I may withdraw from participating up until before transcription without giving a reason.
- Video and audio recordings will be taken during observations and audio recordings will be taken during focus groups and only be used for this study (including contributing to the researcher’s PhD thesis and related outputs).
- Data will be retained for 5 years and then destroyed.
- All data will be stored and reported anonymously. This means that no information will be traced back to me.
- If I decide that I want to withdraw my data from this study, I will be able to do this by contacting Ms Khadija Mohamud via email at any time while conducting the study.
- All my questions about this study have been satisfactorily answered and I am aware of what my participation involves.
- The researcher (Khadija Mohamud) will treat my participation in this study confidential and anything I say will be treated confidentially, unless it leads to Ms Khadija to believe my welfare is in danger or I break the law or put someone else’s welfare at risk. In this case she will be unable to keep this information confidential. If this happens, she will inform me that she will have to share this information with the relevant person at my school because of her concern for my welfare.

Do you consent to photographic images in which you are identifiable being used in the reporting of this research?

Note: The researcher will only implement what you consent to

☐ Yes          ☐ No

I have read and understood the above, and agree to participate:

Participant Name: .................................................................

Signature:  .................................................................

Date: ........................................................................

I have explained all the above and answered all questions asked by the participant.

Researcher Signature:  .................................................................

Date: ........................................................................
Appendix III: Preliminary Study Ethical Approval

Main Study Ethical Approvals and Research Consent

Human Research Ethics Committee (HREC)

From | Dr Duncan Banks
The Open University Human Research Ethics Committee

Email | 

Extension | (6) 59198

To | Khadija Mohamud, IET, CREET

Project title: Investigating the Impact of Internet Kiosks in Uganda.

HREC ref | HREC/2018/2747/Mohamud
Date application submitted: 11/12/17
Date of HREC response: 11/01/18

This memorandum is to confirm that the research protocol for the above-named research project, as submitted for ethics review, has been given a favourable opinion by Chair’s action by the Open University Human Research Ethics Committee.

Please note the following:

1. You are responsible for notifying the HREC immediately of any information received by you, or of which you become aware which would cast doubt on, or alter, any information contained in the original application, or a later amendment which would raise questions about the safety and/or continued conduct of the research.

2. It is essential that any proposed amendments to the research are sent to the HREC for review, so they can be recorded and where required, a favourable opinion given prior to any changes being implemented (except only in cases of emergency when the welfare of the participant or researcher is or may be affected).

3. Please include your HREC reference number in any documents or correspondence. It is essential that it is included in any publicity related to your research, e.g., when seeking participants or advertising your research so it is clear that it has been reviewed by HREC and...
adheres to OU ethics review processes.

4. You are authorised to present this memorandum to outside bodies such as NHS Research Ethics Committees in support of any application for future research clearance. Also, where there is an external ethics review, a copy of the application and outcome should be sent to the HREC.

5. OU research ethics review procedures are fully compliant with the majority of grant awarding bodies and where they exist, their frameworks for research ethics.

6. At the end of your project, you are required to assess your research for ethics related issues and/or major changes. Where these have occurred you will need to provide the Committee with a HREC final report to reflect how these were dealt with using the final report template on the research ethics website - [http://www.open.ac.uk/research/ethics/human-research/full-review-process-and-proforma#final_report](http://www.open.ac.uk/research/ethics/human-research/full-review-process-and-proforma#final_report)

Best regards

Dr Duncan Banks

The Open University Human Research Ethics Committee
Appendix IV: Main Study Ethical Approval and Research Consent

From: Research-REC-Review
Sent: 18 April 2018 07:59
To: Khadija.Mohamud1; Research-REC-Review
Cc: Beck.Pitt
Subject: HREC/2843/Mohamud - Favourable Opinion, by Chair's Action, sent on behalf of the Human Research Ethics Committee

Sensitivity: Confidential

Project title: Investigating the Impact of Internet Kiosks (pseudonym) in Uganda (Main Study)
Date application submitted: 29/03/2018 HREC response date: 06/04/2018

This message confirms that the research protocol for the above-named research project, as submitted for ethics review, has been given a favourable opinion, by Chair’s action, by the Open University Human Research Ethics Committee.

As part of your favourable opinion, it is essential that you are aware of and comply with the following:

1. You are responsible for notifying the HREC immediately of any information received by you, or of which you become aware which would cast doubt on, or alter, information in your original application, in order to ensure your continued safety and the good conduct of the research.

2. It is essential that you contact the HREC with any proposed amendments to your research, for example: a change in location or participants. HREC agreement needs to be in place before any changes are implemented, except only in cases of emergency when the welfare of the participant or researcher is or may be affected.

3. Your HREC reference number has to be included in any publicity or correspondence related to your research, e.g., when seeking participants or advertising your research, so it is clear that it has been agreed by the HREC and adheres to OU ethics review processes.
4. Researchers should have discussed any project-related risks with their Head of Department and/or Supervisor, to ensure that all the relevant checks have been made and permissions are in place, prior to a project commencing, for example compliance with IT security and Data protection regulations.

5. Researchers need to have read and adhere to relevant OU policies and guidance, in particular the Ethics Principles for Research involving Human Participants and the Code of Practice for Research http://www.open.ac.uk/research/ethics/.

6. The Open University's research ethics review procedures are fully compliant with the majority of research council, professional organisations and grant awarding bodies research ethics guidelines. Where required, this message is evidence of OU HREC support and can be included in an external research ethics review application. The HREC should be sent a copy of any external applications, and their outcome, so we have a full ethics review record.

7. At the end of your project, you are required to assess your research for ethics related issues and/or any major changes. Where these have occurred you will need to provide the Committee with a HREC final report to reflect how these were dealt with using the template on the research ethics website - http://www.open.ac.uk/research/ethics/human-research/full-review-process (HREC Final Report)

Professor Louise Westmarland
Chair

Dr Duncan Banks
Deputy Chair

Dr Claire Hewson
Deputy Chair

Human Research Ethics Committee
The Open University
Walton Hall, Milton Keynes, MK7 6AA
Tel: +44 (0) 1908 654858
http://www.open.ac.uk/research/ethics
https://twitter.com/OUResEnt

Khadija A Mohamud
The Open University
Formal Letter Granting Access to Research Sites

21st November 2017

Dear Khadija,

I am delighted to invite you to research the communities in Uganda. You are welcome to seek the permission of the communities to ask if they would like to be part of your research. The founding charity of will support your research without seeking to influence it.

I wish you every success in your work.

Sincerely,

Note: The organisation’s name has been redacted to protect their privacy
Appendix V: Research Consent Forms

Participant (Young Person) Information Sheet (A)

Dear Participant,

I am conducting a study that will investigate the impact Internet Kiosks (pseudonym) in Uganda.

The study will involve you taking part in a preliminary focus group interview with other participants for approximately 45-60 minutes which will be audio-recorded. There are no right or wrong answers, I am interested in your views and opinions. Thereafter, if you consent to taking part in the main study which will be conducted from May 2018, you will participate in a semi-structured individual interview for approximately 45-60 minutes.

In addition, your teacher and parent will be interviewed if you are studying in school. If you are out of school and in employment your employer/referee will be interviewed if available.

Audio recordings will only be used for this PhD project and related outputs. Data will be retained for 5 years and then destroyed.

Your participation in this research is voluntary, you are free to withdraw from the study up until before transcription without giving a reason. Your participation will be treated confidentially, and all information will be kept anonymously, meaning no information will be traced back to you.

If you think of any questions you would like to ask me once I have gone, you can contact me via email at [email protected] or mobile phone number [redacted]. If you would like to withdraw your data, this can be arranged by contacting me at any time while conducting the study.

Kind Regards,

Khadija Mohamud
Researcher
Participant Consent Form

As an informed participant of this study, I understand that:

- My participation is voluntary, and I may withdraw from participating up until before my data is transcribed without giving a reason.
- Audio recordings will be taken during the focus group and semi-structured interview will only be used for this study (including contributing to the researcher’s PhD thesis and related outputs).
- Data will be retained for 5 years and then destroyed.
- All data will be stored and reported anonymously. This means that no information will be traced back to me.
- If I decide that I want to withdraw my data from this study, I will be able to do this by contacting Ms Khadija Mohamud via email or mobile phone at any time while conducting the study.
- All my questions about this study have been satisfactorily answered and I am aware of what my participation involves.
- The researcher (Khadija Mohamud) will treat my participation in this study confidential and anything I say will be treated confidentially, unless it leads to Ms Khadija Mohamud to believe my welfare is in danger or I break the law or put someone else’s welfare at risk. In this case she will be unable to keep this information confidential. If this happens, she will inform me that she will have to share this information with the relevant person at my school or my parent because of her concern for my welfare.

Do you consent to photographic images of you being taken during the study?

Note: The researcher will only implement what you consent to

☐ Yes
☐ No

Do you consent to photographic images in which you are identifiable being used in the reporting of this research?

Note: The researcher will only implement what you consent to

☐ Yes
☐ No
I have read and understood the above, and agree to participate:

Participant Name: .................................................................

Signature: .................................................................

Date:.................................................................

I have explained all the above and answered all questions asked by the participant.

Researcher Signature: .................................................................

Date:.................................................................
Dear Parent,

My name is Khadija Mohamud, a PhD researcher at the Open University, United Kingdom. I am conducting a study that will investigate the impact of the Internet Kiosks (pseudonym) in Uganda. I am writing to request for your son/daughter to take part in the study, if he/she wishes to do so. The study will involve your son/daughter taking part in a focus group interview with other participants for approximately 45-60 minutes which will be audio-recorded. There are no right or wrong answers, I am interested in his/her views and opinions. If your son/daughter also consents to participating in the main study taking place from May 2018, he/she will participate in an audio-recorded semi-structured individual interview for approximately 45-60 minutes.

Your son/daughter’s participation in this research is voluntary, he/she is free to withdraw from the study at any time before his/her data is transcribed without giving any reason. Your son/daughter’s participation will be treated confidentially, and all information will be kept anonymously, meaning no one will know what your son/daughter said.

Thereafter you will be asked to take part in an interview for approximately 45-60 minutes which will be audio-recorded. In this interview you will be asked about your views on any impact you believe the Kiosk has had on your son/daughter. There are no right or wrong answers, I am interested in your views and opinions. This interview will take place in May 2018.

Video and audio recordings will only be used for this PhD project and related outputs. Data will be retained for 5 years and then destroyed.

Your participation in this research is voluntary, you are free to withdraw from the study up until before your data is transcribed without giving a reason. Your participation will be treated confidentially, and all information will be kept anonymously, meaning no information will be traced back to you.
If you think of any questions you would like to ask me once I have gone, you can contact me via email at [email protected] or mobile phone number [redacted]. If you would like to withdraw your data, this can be arranged by contacting me at any time while conducting the study.

Kind Regards,

Khadija Mohamud

Researcher
Participant Consent Form

As an informed participant of this study, I understand that:

My son/daughter’s participation in this research will involve

- Taking part in a focus group lasting 45-60 minutes.
- Taking part in an interview lasting 45-60 minutes
- Being observed for a maximum of 45 minutes in two intervals whilst using the hub.
- My son’s/daughter’s and my participation is voluntary and we may withdraw from participating up until before my data is transcribed without giving a reason.
- Video and audio recordings will be taken during observations and audio recordings will be taken during focus groups and only be used for this study (including contributing to the researcher’s PhD thesis and related outputs).
- Data will be retained for 5 years and then destroyed.
- All data will be stored and reported anonymously. This means that no information will be traced back to me.
- If I or my son/daughter decides that we want to withdraw our data from this study, we will do this by contacting Ms Khadija Mohamud via email or mobile phone at any time while conducting the study.
- All my questions about this study have been satisfactorily answered and I am aware of what my participation involves.
- The researcher (Khadija Mohamud) will treat my participation in this study confidential and anything I say will be treated confidentially.

Do you consent to photographic images of you being taken during the study?

Note: The researcher will only implement what you consent to

☐ Yes

☐ No

Do you consent to photographic images in which you or your son/daughter are identifiable being used in the reporting of this research?

Note: The researcher will only implement what you consent to

☐ Yes
☐ No

I have read and understood the above, and agree to participate:

Participant Name: ...........................................................................................................

Signature: ......................................................................................................................

Date: ............................................................................................................................

I have explained all the above and answered all questions asked by the participant.

Researcher Signature: .................................................................................................

Date: ............................................................................................................................
Participant (Adult) Information Sheet (C)

Dear Participant,

I am conducting a study that will investigate the impact the Kiosks (pseudonym) in Uganda.

The study will involve you taking part in an audio-recorded semi-structured individual interview for approximately 45-60 minutes. There are no right or wrong answers, I am interested in your views and opinions.

Audio recordings will only be used for this PhD project and related outputs. Data will be retained for 5 years and then destroyed.

Your participation in this research is voluntary, you are free to withdraw from the study up until before transcription without giving a reason. Your participation will be treated confidentially, and all information will be kept anonymously, meaning no information will be traced back to you.

If you think of any questions you would like to ask me once I have gone, you can contact me via email at [email protected] or mobile phone number [cell number]. If you would like to withdraw your data, this can be arranged by contacting me at any time while conducting the study.

Kind Regards,

Khadija Mohamud
Researcher
Participant Consent Form

As an informed participant of this study, I understand that:

- My participation is voluntary, and I may withdraw from participating up until before my data is transcribed without giving a reason.
- Audio recordings will be taken during the semi-structured interview and only be used for this study (including contributing to the researcher’s PhD thesis and related outputs).
- Data will be retained for 5 years and then destroyed.
- All data will be stored and reported anonymously. This means that no information will be traced back to me.
- If I decide that I want to withdraw my data from this study, I will be able to do this by contacting Ms Khadija Mohamud via email or mobile phone at any time while conducting the study.
- All my questions about this study have been satisfactorily answered and I am aware of what my participation involves.
- The researcher (Khadija Mohamud) will treat my participation in this study confidential and anything I say will be treated confidentially, unless it leads to Ms Khadija Mohamud to believe my welfare is in danger or I break the law or put someone else’s welfare at risk. In this case she will be unable to keep this information confidential. If this happens, she will inform me that she will have to share this information with the relevant authority because of her concern for my welfare and welfare of others.

Do you consent to photographic images of you being taken during the study?
Note: The researcher will only implement what you consent to

☐ Yes
☐ No

Do you consent to photographic images in which you are identifiable being used in the reporting of this research?
Note: The researcher will only implement what you consent to

☐ Yes
☐ No

I have read and understood the above, and agree to participate:

Khadija A Mohamud
The Open University
Participant Name: ..............................................................................................................

Signature: ....................................................................................................................

Date: .............................................................................................................................

I have explained all the above and answered all questions asked by the participant.

Researcher Signature: ...................................................................................................

Date: .............................................................................................................................
Appendix VI: Preliminary-Study Guides

Focus Groups Guide

Participants

- Four single sex focus groups with young people who were users of the Kiosks, two groups from each Kiosk with six to seven participants per group. Each focus group lasting between 45 to 60 minutes.

Organisation

- Ensured all relevant consent was obtained from participants (children and their parents where participants were below 18 years old) and made sure they understood what the research was about.
- Assured participants that the researcher was interested in their views and opinions and that there were no right or wrong answers and checked that they were comfortable with this.
- Focus groups were conducted in a quiet location familiar to participants
- Focus groups were conducted in single sex groups to allow participants to freely discuss gender issues
- Focus groups were audio-recorded, and field notes taken where necessary
- Where appropriate permissions were in place, a photo of each focus group was taken (to assist the researcher and supervisory team to identify participants of each group when analysing).
- Provided participants an opportunity to ask about the research.

Aims

The objective of the focus groups was to address the initial research questions:

**RQ1 a:** What impact, if any have the Kiosks at two sites in Uganda, had on school-going users lives so far?

**RQ2 a:** To what extent are the Kiosks at two sites in Uganda complementing formal education?

**RQ3 a:** How does gender impact on the findings for questions one and two (if at all)?
Areas to cover

- General questions to understand participants’ perceptions and experiences of using or not using the Kiosks.
- Positive impacts of the Kiosks/ negative impacts and how they tackled them.
- Similarities and differences of the Kiosks.
- Information about factors at each Kiosk that enabled or hindered their use.

Guiding questions for focus groups with young people (Kiosks users)

- Tell me about your experience using the Kiosks (pseudonym).
- How long have you been using it for?
- What purpose/s do you use it for?
- Does the Kiosk (pseudonym) complement or distract your formal education?
- As a male/female do you get adequate opportunity to use the Kiosk(pseudonym)?
- What led to the Kiosks not functioning? (Added during fieldwork as a result of the findings from observing the computers at the Kiosks were non-functional)

Thanked participants for taking part in the research.
Interview Guide with Kiosks Gatekeepers

Participants

- Skills to Survive representative (Founder)
- Helping Hands representative
- Local community representatives including Kiosks committee members

Guiding Interview questions

Skills to Survive

- Tell me about your journey as Skills to Survive (pseudonym) in relation to the Kiosks (pseudonym).
- How did you partner with the local partner, Helping Hands (pseudonym)?
- How did you engage with the local communities?
- What was done to understand the context before the Kiosks were built?
- What are the triumphs and challenges faced in this project?
- What have you learnt from this experience?

Helping Hands

- Tell me about your journey as Helping Hands (pseudonym) in relation to the Kiosks (pseudonym).
- How was the partnership between Skills to Survive (pseudonym) and Helping Hands (pseudonym) established?
- How did you engage with the local communities?
- What are the triumphs and challenges faced in this project?
- What are the issues causing the breakdowns of the Kiosks (pseudonym)? (added during fieldwork as a result from findings of observations within the field and data from focus groups with young people).
- How was the local community involved in the initial planning of the kiosks?
- How was the process of the building Kiosks established?
- Do other partnerships except with Helping Hands exist?
Kiosks committee representatives

- When was the committee formed and who does it contain?
- What role does the committee play?
- How often do you meet?
- As a committee member, what are the good and bad experiences you have had?

Thanked participants for taking part in the research.
Appendix VII: Main-Study Guides

Focus Groups Guide

Participants
Four single sex focus groups with young people who were users of the Kiosks: two groups from each Kiosk with six to seven participants per group. Each focus group lasting between 45 to 60 minutes. This aimed to build on the focus group data generated during the preliminary study.

Note: It was only possible to conduct three single sex focus groups; two from Kiosk A and one from B. This was due to participant inaccessibility.

Organisation
The organisation was the same as what was done in the preliminary study (see above).

Guiding questions for focus groups with young people (Kiosks users)
- Tell me about your experience using the Kiosks (pseudonym).
- How long have you been using it for?
- What purpose/s do you use it for?
- Does the Kiosk (pseudonym) complement or distract your formal education?
- As a male/female do you get adequate opportunity to use the Kiosk (pseudonym)?
- What led to the Kiosks not to work? (Added during fieldwork)
Interview Guides

Participants

- School-aged users (both enrolled and not enrolled in school)
- School-aged non-users
- Teachers (to corroborate in-school users’ sentiments and to share their experiences of using the Kiosks, only applicable to those who use it)
- Parents (to corroborate sentiments from young people)
- Community users including WiFi users

Organisation

- Ensured all relevant consent was obtained from participants (children and their parents where participants are under 18 years old).
- Provided participants an opportunity to ask about the research and ensured they understood what it is about.
- Assured participants that the researcher was interested in their views and opinions and that there were no right or wrong answers. Checked that they were comfortable with this.
- The researcher had different interview questions for the different participants.
- Interviews took place in a quiet location familiar to the interviewee.
- Interviews were audio-recorded, and field notes were taken.

Aims

The objective of the interviews was to address the refined research questions:

**RQ1:** What are the contextual factors that influence access and utilisation of the Kiosks at the two sites in Uganda?

**RQ2:** What are the perceptions of impact of the Kiosks on users (young people and adults) at the two sites in Uganda?

**RQ3:** What aspects are crucial to sustainability of the Kiosks and are relevant to similar CTC interventions in low-income contexts?
Guiding questions for interview questions with young people (Kiosks users)

- What is your perspective of the Kiosk?
- What purpose/s do you use the Kiosk for?
- What impact if any has the Kiosk had on your life so far?
- Are there any opportunities you have gained while using the Kiosks?
- Are there any challenges you have faced while using the Kiosks?
- As a male/female, do you have adequate opportunity to use the Kiosk? Please Elaborate
- What issues contribute to the Kiosks breaking down?

Guiding questions for interview questions with teachers

- What is your perspective of the Kiosk?
- What impact has it had on your student (mention student name) so far?
- What impact has it had on you so far? (For teachers who were users)
- Are there any aspects that enable or hinder users’ access to the Kiosk? (For Kiosk A)
- Do you have any idea of the issues that contribute to the Kiosks not functioning?

Note: More questions derived from individual interviews with young people who were enrolled in school.

Guiding questions for interview questions with parents

- What is your perspective of the Kiosk as a parent/carer?
- How has your child used it?
- Do you support your child using the Kiosk?

Note: More questions derived from individual interviews with young people.

Guiding questions for interview questions with community users

- What is your perspective of the Kiosk?
- What purpose/s have you been using the Kiosk for?
- What has your experience been like?
Guiding questions for stakeholder focus group

- What issues contribute to the Kiosks not working including WiFi?
- How were you involved as a community in the development of the Kiosk?
- How are the Kiosks managed and maintained?
- Do you feel the Kiosk belongs to you as a community?
- As a community do you feel having the Kiosks and access to the Internet adds value?

Thanksed participants for taking part in the research.
Appendix VIII: Example Field Notes

18 January 2018
Meeting with the Fieldworkers of the Survey

Today, I had the first introductory meeting with the fieldworkers. I gave each of them a brief overview of the survey objectives and their roles. We discussed the importance of accurate data collection and the need for confidentiality. The meeting lasted for about an hour.

22 January 2018
Field Notes from focus group with young people and school-going youth

Today I conducted a focus group with young people and school-going youth. We met at 10:00 am at the school. The group consisted of 10 participants. We discussed their experiences of school, peer pressure, and future aspirations.

1. Main themes that emerged:
   a) Positive impacts
   b) Formal learning: the impact on school work research and limitations they encounter with their education system. The challenges experienced were:
      i) Lack of textbooks at school and the pressure to finish the textbooks by the end of the academic year
      ii) Limited teaching resources available
   c) Sometimes they don’t finish the syllabus and are expected to know everything in the syllabus

Participants shared their challenges and how they cope with them. Some solutions mentioned were:
   i) Digital literacy and ICT skills
   ii) Development of digital learning tools
   iii) The need for continuous professional development for teachers and school administrators.

Field Notes from focus group with young people and school-going youth
8 May 2018

Focus Group Field Notes - Young People
Focus Group with out of school young people

Focus Group 1 - Three Boys
1) Focus grp 1 - two girls
All focus groups conducted at a church that was familiar to participants. I conducted the focus group in Luganda as a Luganda facilitator who was also with them.

Main Emerging Themes
- Pull - Positive Impact
- Digital Literacy and ICT Skills
- Confidence, Self-esteem & Motivation
1) Socialising in Recreational Space
- Making new friends at the boot camp
- Social Media - New friends via social media

Looking for world news and staying up to date
5) Entertainment through watching YouTube videos, playing online video games and watching football matches online

\[\text{Quote 1: Negative Impacts/challenges of the boot camp}
\]
1) Constant non-functionality of the boot camp
2) Exposure to pornography sites
3) The risk impact on them when they accidentally found pornography; mental and emotional damage
4) Bullying - young people openly being bullied by older men & the girls were concerned about being bullied from the boot camp
5) Vandalism at the boot camp

People stealing corners from the boot camp which led to non-functionality of the boot camp

\[\text{Quote 2: Negative Perceptions some will express about their parents have a negative perspective, given that they don't know the positives about the boot camp.}
\]
All these quotes are recorded in the digital recording device. I will transcribe them.
### Appendix IX: Data Grid Tables

#### Section 1: Data related to Young People at Kiosk A

<table>
<thead>
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<th>Pseudonym</th>
<th>Age (years)</th>
<th>Gender</th>
<th>Participant Data</th>
<th>Carer Data</th>
<th>Schooling Status</th>
<th>Teacher Data</th>
<th>Focus Group Data</th>
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<td>In</td>
<td>Mr. Williams Interview transcript</td>
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<td>In</td>
<td>Ms. Jessica Interview transcript</td>
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<td>In</td>
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<td>F</td>
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<td>In</td>
<td>Ms. Jacinta Interview transcript</td>
<td>FG1 transcript</td>
</tr>
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<td>Kareema Interview transcript</td>
<td>In</td>
<td>Ms. Jessica Interview transcript</td>
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**Section 2: Data related to Young People at Kiosk B**
Section 3: Data related to Adults at Kiosk A and B

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Section 4: Data related to the Kiosks

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**Section 5: Data related to non-users**

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