

# **The Role of Girls' Mobile Phone Use to Increase Access to Educational Content After School: A Capabilities-Based Evaluation in Nairobi**

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## **Declaration of Authorship**

I, Ronda Zelezny-Green, hereby declare that this thesis and the work presented in it is entirely my own. Where I have consulted the work of others, this is always clearly stated. The work has not previously been submitted in part or in whole to any university for any degree or other qualification. In accordance with regulations of Royal Holloway, University of London, the thesis contains no more than 100,000 words of text.

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

## Abstract

This thesis evaluates the development outcomes of an action research intervention implemented during the after-school hours at and near a girls' secondary school in Nairobi, Kenya. The intervention and its design was grounded in the capability approach, the people-centered perspective of human development articulated by Amartya Sen. The aim was to help 22 girl research participants lead lives they had a reason to value by investigating how they might increase their access to educational content after school. The work to realize their chosen development outcome was facilitated by the introduction of two mobile learning applications, biNu and Worldreader, for after-school use in the girls' homes. Data collection was undertaken during after-school hours and in three phases over 13 months using mixed methods including mobile ethnography, app usage statistics analysis, in-home participant observation, and an innovative method for operationalizing resource-based agency adapted from a capabilities-based research project with children in India.

Through application of Dorothea Kleine's Choice Framework as both an analytical and evaluative lens for operationalizing the capability approach, it emerged by the study conclusion that time and mobility were the most influential factors to affect the girls' ability to sustain appropriation of the two apps. These factors shaped the expansion of choice unevenly among the research participants, particularly when combined with deeply embedded discourses, informal norms, national policies, and school as an institution in the research context. Age and gender were two personal characteristics which also had a substantial effect on the development outcomes realized. The study serves as further evidence that enhancing a girl's agency by augmenting her resource portfolio is insufficient to bring about educational empowerment if the structures within which her resources are utilized after school remain unaltered.

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*Seems like it was yesterday when I saw your face  
You told me how proud you were, but I walked away  
If only I knew what I know today*

*I would hold you in my arms  
I would take the pain away  
Thank you for all you've done  
Forgive all your mistakes*

*There's nothing I wouldn't do  
To hear your voice again  
Sometimes I want to call you, but I know you won't be there*

*I'm sorry for blaming you for everything I just couldn't do  
And I've hurt myself by hurting you*

*Some days I feel broke inside, but I won't admit  
Sometimes I just want to hide 'cause it's you I miss  
You know it's so hard to say goodbye when it comes to this*

*Would you tell me I was wrong?  
Would you help me understand?  
Are you looking down upon me?  
Are you proud of who I am?*

*There's nothing I wouldn't do  
To have just one more chance  
To look into your eyes and see you looking back*

*I'm sorry for blaming you for everything I just couldn't do  
And I've hurt myself*

*If I had just one more day, I would tell you how much that  
I've missed you since you've been away*

*Oh, it's dangerous  
It's so out of line to try to turn back time*

*I'm sorry for blaming you for everything I just couldn't do  
And I've hurt myself  
By hurting you*

Written by Christina Aguilera, Linda Perry, Mark Ronson

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## List of Acronyms

<b>AAWORD</b>	Association of African Women for Research and Development
<b>AR</b>	Action Research
<b>BBC</b>	British Broadcasting Corporation
<b>CA</b>	Capability Approach
<b>CBD</b>	Central Business District
<b>CF</b>	Choice Framework
<b>CODESRIA</b>	Council for the Development of Social Science Research in Africa
<b>DLP</b>	Digital Literacy Programme
<b>FGD</b>	Focus Group Discussion
<b>FT</b>	Fair Trade
<b>GAD</b>	Gender and Development
<b>GSMA</b>	Groupe Spéciale Mobile Association
<b>HDCA</b>	Human Development and Capability Association
<b>IATECAS</b>	Increase Access to Educational Content After School
<b>ICRW</b>	International Center for Research on Women
<b>ICT</b>	Information and Communications Technology
<b>ICT4D</b>	Information and Communications Technology for Development
<b>ICT4E</b>	Information and Communications Technology for Education
<b>IFC</b>	International Finance Corporation
<b>IVR</b>	Interactive Voice Response
<b>KASNEB</b>	Kenya Accountants and Secretaries National Examinations Board
<b>KCPE</b>	Kenya Certificate of Primary Education
<b>KCSE</b>	Kenya Certificate of Secondary Education
<b>KES</b>	Kenyan Shillings
<b>KICD</b>	Kenya Institute of Curriculum Development
<b>KNBS</b>	Kenya National Bureau of Statistics
<b>M4Lit</b>	Mobiles for Literacy
<b>MDG</b>	Millennium Development Goals
<b>MoEST</b>	Ministry of Education, Science, and Technology
<b>NDSS</b>	New Day Secondary School
<b>NGO</b>	Non-Governmental Organization
<b>OLPC</b>	One Laptop per Child
<b>PhD</b>	Doctor of Philosophy

<b>PLA</b>	Participatory Learning and Action
<b>R&amp;A</b>	Ranking & Association
<b>RQ</b>	Research Question
<b>SIM</b>	Subscriber Identity Module
<b>SMS</b>	Short Message Service
<b>SSA</b>	Sub-Saharan Africa
<b>STI</b>	Science, Technology, and Innovation
<b>UN</b>	United Nations
<b>UNCTAD</b>	United Nations Conference on Trade and Development
<b>UNDESA-GAID</b>	United Nations Department of Economic and Social Affairs Global Alliance for ICT and Development
<b>UNESCO</b>	United Nations Educational, Scientific, and Cultural Organization
<b>UNICEF</b>	United Nations International Children’s Emergency Fund
<b>UPE</b>	Universal Primary Education
<b>US</b>	United States
<b>WEF</b>	World Economic Forum

# Chapter 1: Introduction

## 1.1. “It’s not only in school that you find books and teachers.”

For the past 30 years, girls’ education in the Global South<sup>1</sup> has steadily risen in importance in international development agendas. In 1990, UNICEF held the World Summit for Children, out of which the “World Declaration on the Survival, Protection, and Development of Children” was developed. The Declaration articulates the following mission:

At present, over 100 million children are without basic schooling, and two-thirds of them are girls. [...] We will work for programmes that reduce illiteracy and provide educational opportunities for all children, irrespective of their background and gender; [...] and that enable children to grow to adulthood within a supportive and nurturing cultural and social context. (UNICEF, n.d.)

As the Declaration reports, girls were found to be at a disadvantage for basic schooling access. Following the Summit, the 1990s were designated the Decade of the Girl Child, intending to raise awareness of the various sources of exclusion that girl children come up against, especially in regards to education. While awareness was raised, millions of girls remained excluded from school (Heidemann & Ferguson, 2009). Some also argue that, in addition to awareness-raising, the designation of the Decade of the Girl Child contributed to focus being placed on girl children in a way that they were ‘othered’ and positioned as ‘surviving childhood’ instead of ‘progressing through human development’ like children in the Global North (Burman, 1995).

A decade later in 2000, the UN published the Millennium Development Goals. Target 3A of these goals is to: “Eliminate gender disparity in primary and secondary education, preferably by 2005, and in all levels of education no later than 2015,” (UN, n.d.). Research, policies, and programs between 2000 and 2014, the year fieldwork for this thesis was conducted, continued to emphasize the importance of formal education for girl children. This included an intense focus on education and learning opportunities that occur in school-based institutions (Bellamy, 2004; Herz & Sperling, 2004; Pepler Barry, 2000; World Bank, 2014b).

The quote that serves as the title of this section was shared by Everlyne<sup>2</sup>, one of the 22 research participants from New Day Secondary School (NDSS) in Nairobi. During a focus group discussion, she highlighted that school is not the only space where learning can occur. Indeed, while much attention in international development literature has been given to girls’ formal education and schools as traditional learning spaces (F. N. Chege & Arnot, 2012), research also

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<sup>1</sup> I will primarily use the terms ‘Global South’ and ‘Global North’ to refer to what is elsewhere commonly referred to as ‘developing’ and ‘developed’ countries. This decision was taken in recognition of the knowledge that even wealthier countries remain in processes of development.

<sup>2</sup> Everlyne is not her real name. All names and other identifying information in this thesis have been changed to protect the identities of the research participants and the school community.

indicates that schools are not the only locations where girls' education can happen. In fact, learning that can occur away from school grounds, such as through sporting activities, girls' clubs, and programs which promote spirituality, has been found to enhance girls' lives in the Global South – sometimes with positive impacts for their formal learning experiences (Unterhalter et al., 2014). Moreover, there is increasing understanding that formal schooling is not the only type of education that people have reason to value. Indeed, non-formal and informal learning are valued as well for their contributions to holistic human development, and attempts are being made to connect the learning types that occurs in- and after school (Eshach, 2007).

These circumstances form part of the rationale for why this thesis will concern itself with critically underexplored, alternative learning spaces in girls' education, namely those outside of school and/or during after-school hours. However, the development outcome expressed by the 22 girls in this study, to have choice to increase access to educational content after school (or IATECAS, as this will sometimes be shortened throughout this thesis; see **section 1.2** for further information about this development outcome), was another reason why after-school spaces will be explored. Their desire necessitated a consideration of the tools that could be used for learning and that were available to the girls during after-school hours, of which mobile technology was one.

Alongside the past 30 years of girls' education promotion, there has been a proliferation of information and communication technologies (ICTs) in developed and developing countries alike. ICTs include the internet, radios, laptops, and mobile phones, and are technological innovations which can help people retrieve information and communicate with other people through virtual means (UNCTAD, 2003). We have seen most countries in the Global North follow a similar ICT development pathway, commencing with mass adoption of landline telephones and fixed-line internet access, and followed by the diffusion of wireless communication in the mid-1990s onward. However most countries in the Global South, including Kenya, have gone directly to the adoption of mobile technologies and accompanying infrastructure (Castells, Fernández-Ardèvol, Qiu, & Sey, 2007).

As the arguably most rapidly diffusing technology in the history of the world, mobile has become the vehicle for a variety of social uses, including education (Castells, Fernández-Ardèvol, Qiu, & Sey, 2004). Moreover, traditional notions of how education participation should be enacted are being altered by the proliferation of mobile technologies (Ally & Tsinakos, 2014). Just before research for this thesis began, UNESCO (2012b, 2012c, 2013) launched research efforts to explore the potential for mobile learning across the world. Mobile learning is broadly defined as people's appropriation of mobile technologies to enhance their

skills or acquire knowledge (Traxler, 2010b) (other definitions of mobile learning, including the more specific one I will use in this thesis, can be found in Chapter 2).

The use of mobiles for education and learning has grown to include mobile reading, or utilization of a mobile device to read content (Baron, 2013a). In the Global North, mobile reading has emerged as a practice in large part because books are increasingly being digitized (Adler, Gujar, Harrison, O'Hara, & Sellen, 1998; Baron, 2013b). However, in the Global South, mobile reading has been spurred in part by a severe lack of textbooks and other paper-based reading materials, both inside and outside of schools (Crabbe, Nyingi, & Abadzi, 2014). Access to books after school are just as important as their in-school use: Research which examined data from 27 high- and low-income countries found that children who come from low-income households with family members who have low educational attainment can benefit the most from books, and each book they get access to makes an impact:

[...] Children who grew up without books [in their homes] completed around 7 years of education on average [...]. Those growing up with a couple of dozen books completed 11 years, and offspring of the most bookish parents completed 14 years of education [...]. Thus, on average, 7 years of education separate those who grew up without books in the home from those who grew up with 500 or more, a huge difference. Each additional book is associated with greater gains in educational attainment in families with few books than in families where there are already many books. (Evans, Kelley, Sikora, & Treiman, 2010, p. 179)

With this framing, this thesis will explore the emergent connections between after-school hours, girls' education, and mobile technology with a community of secondary school girls in Kenya. The aim of this research will be to undertake actions which might contribute to change the research participants have reason to value. In the next section, I will provide more detail on the changes the girls desired, and why and how these changes were a motivating factor for this intervention.

## 1.2. Study Motivation

Before I can explain how the study evolved during the 13-month period in which it was implemented, I must first discuss the motivations behind carrying out the research.

In 2012, I contacted an employee of the British Council in Kenya who agreed to help me identify a district-level girls' secondary school in Nairobi with whom to conduct research (see **Chapter 4** for further information on the school's profile). Of the three secondary school types in Kenya, national, provincial, district, district-level schools are most numerous, least exclusive in terms of the exam grades required for admission, and often serve the neediest learners from academic and socioeconomic perspectives (Lucas & Mbiti, 2014). District schools are also unlikely to have sufficient facilities and resources, such as books and ICTs, to support teaching and learning efforts because the children who attend these schools come from households with limited financial means and cannot afford to enroll in schools with more

amenities (ibid.). I was motivated to conduct research with learners who experience poverty and marginalization because they could potentially benefit from research activities that might help them work towards eliminating sources of inequality. After visiting three district-level schools in Nairobi, NDSS's Principal Patricia Sumba was the only principal to provide permission for me to conduct research with her school community.

The decision to work with a poor, urban, single-sex school community was intentional because, as I will elaborate in Chapter 2, the development outcomes that girls want are frequently misrepresented when portrayed in international development literature: Often, girls' ambitions are narrowly framed in growth-focused language which advances the notion that by facilitating a girl's access to education, in the future she will be able to actively participate in her national economy and contribute to poverty reduction (Hickel, 2014). This framing of girls' ambitions is alternately referred to as a human capital approach to education. I wished to conduct research with a student population that faced myriad challenges in- and after school to understand, in their own words, the development outcomes they themselves wished to realize, and why. This was because, based on my personal experience growing up in poverty while attending a secondary school in the U.S., I suspected that the girls' experiences might not match prevailing understanding of girls' wants and ambitions in international development contexts.

To this end, I conducted an exploratory study with NDSS in July and August 2013. During the study, I asked school community members, including girl learners, questions about the structure of girls' daily routines after school, the learning activities they engaged in during this period, and the tools they used during the after-school hours while engaging in the learning activities they mentioned. I also inquired about the changes, if any, they wished to see in the girls' quotidian after-school experiences. I employed two research methods: participant observation of four girls during after-school hours and semi-structured interviews with various members of the NDSS community (see **Table 1-1**).

**Table 1-1**

Community Member Classification	Number of Semi-Structured Interviews Conducted
Girl Learner	4
Parent or Guardian	2
Teacher	3
School Principal	1
School Staff Member	1

*The participants and quantity of semi-structured interviews conducted during 2013 exploratory study (Author)*

As I reviewed the data from the participant observations and 11 semi-structured interviews, a recurrent theme surfaced which was expressed directly by the girl learners, and

later corroborated by adult stakeholders at NDSS: the girls' desired development outcome was to have increased access to educational content after school, especially books related to their formal schooling:

*Some of the textbooks we read, that you find in schools, some of them are outdated. [...] It's the same textbook that I used when I was a student [...].* Teacher Saul Okono

*A library.* Principal Patricia Sumba

*Maybe more revision books.* Learner Lydia Mwangi

When I asked the interviewees why they sought to increase their/the girls' access to educational content after school, nine out of 11 responses from the girls, both parents, two teachers and the school staff member focused on being able to have the material resources they thought necessary for the learners to improve their grades, which could then lead to academic success. The perceived social desirability of these responses could have played a role in which development outcomes were expressed in the exploratory study. Nonetheless, because of how schooling is structured in Kenya, and because of the prevailing societal attitudes and discourses about education more broadly, this desired development outcome was probably truthful, at least in part, given that earning good grades in school and on exams signals that a person is likely to attain future successes (Buchmann, 2002; Buchmann & Dalton, 2002; Muola, 2010). Especially for girls, educational success weighs heavily on the future opportunities thought to be within their reach, including the chance for further study (F. Chege & Sifuna, 2006b).

Although education appeared to be intrinsically important to the research participants, the choice to increase their access to educational content after school, hopefully leading to improved grades and academic success, undoubtedly had links to what might be expected in a human capital education model. Such a model, like I highlighted briefly in section 1.1, prioritizes educational outcomes to promote a learner's future productivity, wage-earning potential, and economic contributions (Robeyns, 2006b). In this respect, it was challenging to place the responsibility of defining development outcomes with the girls because it could be argued that the development outcomes they expressed were merely the outcomes they thought they were expected to have (Unterhalter, 2003a). Nonetheless, I believe that defining the desired outcomes of a research intervention is ultimately the participants' decision because they should have the opportunity to decide what constitutes the good life instead of having someone else's will imposed on them.

By providing space for the girl learners and wider NDSS community to decide what outcomes mattered, even if these outcomes were narrowly framed, it was still possible that their desired outcomes could give rise to positive and unexpected benefits that the girls might



also value, and which are not strictly related to growth-focused conceptualizations of development:

*What is important is to give them the right information and they'll be able to choose. [...] So, give her the right information, it will empower her.* Teacher Saul Okono

As such, my role as an action researcher then became one in which I helped the girls articulate their wants, and then worked together with them to support the realization of these desired outcomes – insofar as it was possible given the circumstances at the time – and in ways that sought to avoid causing them harm.

Using the findings from this exploratory study, I later revisited the identified desired development outcomes (choice to increase access to educational content after school, improved grades, and academic success) with the 22 research participants who came to be a part of the main study implemented over 13 months between December 2013 and January 2015. This was done to ensure these outcomes were also desired by and relevant to them; the girls agreed that they were. Having established outcomes to work towards, I next had to consider what might help bring about the desired change.

Before this piece of action research, the options available to the girls to increase their access to educational content after school were generally found at school: When this study was conducted with NDSS in 2014, the only consistent library and computer access available to the learners was at NDSS. The computer lab often did not have Wi-Fi connectivity and was frequently closed and shuttered after school. The library sometimes prioritized access by the level of schooling the girl had completed, with girls in the final year of secondary schooling accorded preferential access while girls in the first, second, and third years of secondary education sometimes denied access if they wanted to enter the library when it was already at its capacity.

Although public libraries and cybercafés could be visited after school, for most students this was not an option because these places were closed by the time they began their journeys home from school. In the case of cybercafés, the associated access costs also proved to be a barrier. In parallel, the learners reported that the ICT device they used most frequently in the after-school hours was the mobile phone. A survey I conducted in 2012 with a third of the 400 students in the NDSS school population indicated that approximately 45% of these learners owned their own mobile phone (Zelezny-Green, 2014). However, because a national ban exists which forbids Kenyan students from carrying mobile phones to schools, the girls' usage of these devices could only occur during the after-school hours at home. These findings led me to consider: Is it possible to use a material resource that many already owned to facilitate increased access to educational content after school?

Given the existing barriers to access educational content after school, and considering the availability of mobile phones among the research population, I took the desired outcome for increased access to educational content after school and partnered it with my own interest in investigating ways to use mobile technologies in educational settings to effect sustainable and desirable change. Doing so provided a basis from which to develop the main research question, conceptual framing, and research process for this intervention, all of which will now be discussed in turn.

### 1.3. Main Research Question

The preceding events led to the formulation of the main research question which will guide this study:

***How, if at all, might the introduction of mobile tools impact the girls' desired primary development outcome of having choice to increase their access to educational content after school?***

The decision to focus on increasing the choices available after school to the research participants was influenced by a normative framework for international development, the capability approach (CA).

### 1.4. Conceptual Framing

To understand why and how the CA came to inform this research, I must first explore the links between the CA, international development, and education.

The CA is a people-centered approach to international development. This framing conceptualizes development as a process which should seek to enhance the real freedoms, or capabilities, that people have (Sen, 1999). By working towards capabilities enhancement, the aim is to increase the choice that an individual has to lead a life that she has reason to value. Agency constitutes part of these capabilities, and is itself enacted within various societal structures which may expand or constrain one's agency. Therefore, Sen (1999) maintains, human development should contribute to helping people lead lives they have reason to value by removing various sources of unfreedoms which may constrain capabilities, limit or remove choice, and prevent people from realizing the development outcomes they desire. Although Sen (ibid.) does not heavily emphasize the structural aspects involved with one's ability to lead a life they have reason to value (Roberts, 2016), structure is nonetheless an important component to be considered alongside agency in capabilities-based development perspectives.

In the capabilities view of development, Sen (1999) discards narrowly-focused notions that development is purely economic in nature:

If the object is to concentrate on the individual's real opportunity to pursue her objectives [...], then account would have to be taken not only of the primary goods the

persons respectively hold, but also of the relevant personal characteristics that govern the *conversion* [original emphasis] of primary goods into the person's ability to promote her ends. (p. 74)

Essentially, Sen contests the focus on a person's wealth in terms of goods (e.g. financial, material, etc.) because having an abundance of financial capital does not necessarily mean that she can make use of this capital in ways she may wish to. The goods available to a person form only part of the agency she can exercise within the structure she lives: Sen would argue that her personal characteristics such as her age, gender, ethnicity, religion, etc. can also contribute to the amount and type of agency she can exhibit as she uses the goods she has.

Turning attention to the links between the CA, international development, and education, Robeyns (2006b) conducts a review of three predominant models of education. She discussed how growth-focused, rights-based, and a capability approach to education differ and the areas in which they share commonalities. Whereas *growth-focused* (or human capital) educational approaches promote education for the sake of economic development outcomes (including income earned over a lifetime), and *rights-based* approaches are reliant upon moral and legal principles to achieve globally agreed upon outcomes such as access to education for all, a *capability approach* to education is purposely open in terms of the outcomes to be achieved (ibid.). This openness is because while the other models also indicate understandings that education development is inherently complex, capabilities-based education works from the perspective of understanding what individuals value for their own lives, and use that as the departure point for any development efforts.

To contextualize Robeyns's (2006b) analysis further, I will make a distinction between human capital educational theories and the CA: A secondary school girl in Kenya values becoming an engineer. While she may be enrolled in a national-level school and come from a middle-class background, if she lacks the psychological resource of confidence to succeed in a career as a pilot because of societal discourses around the types of employment 'suitable' for females, she may never become a pilot despite having the financial resources to do so. When you consider that capital and its intrinsic value still occurs within the confines of various societal structures, it becomes clear that a capital-based approach to education struggles when it is acknowledged that multiple factors can influence how a person is able to make use of that capital for a reason they may value.

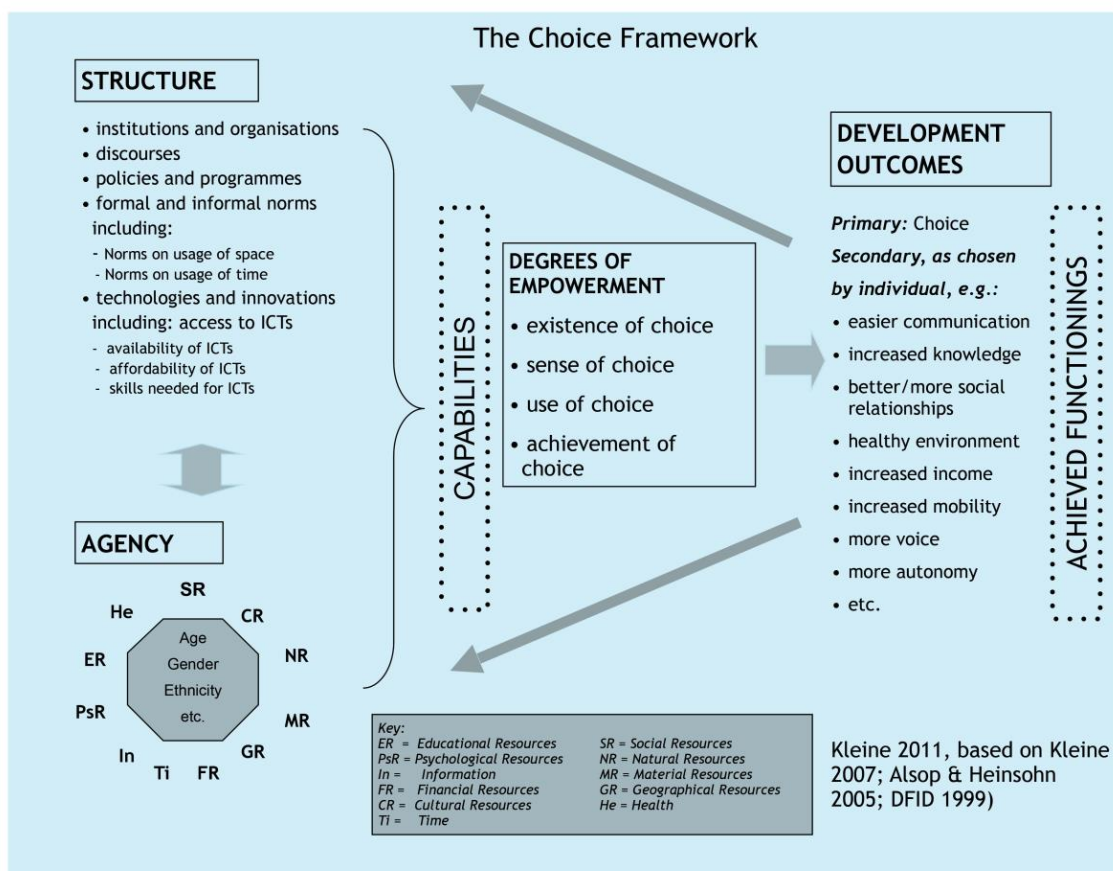
Human development from the capabilities perspective is often linked to the human rights discourse. In fact, Sen (2005) argues for avoiding the inclination to subsume rights-based approaches to development to the development as freedom philosophy, and vice versa. Instead, Sen (1999) conceives of the capabilities-based approaches to development in a way

that can be complemented by rights-based approaches, and supported by public reasoning and policy, in addition to individual action.

Earlier, I advanced the argument that it was important to have the secondary school girls in this study define the development outcomes they desired. In doing so, I wished to counter common policies and practices in international development that can limit girls' desired outcomes to those defined by multilateral actors in the Global North – and which often reduce girls' development outcomes to economic benefits such as future income generation (Lloyd & Young, 2009) or more rights-based goals such as being enrolled in school in numbers commensurate to boys (Unterhalter, 2005). Education is frequently mentioned by Sen as a valuable constituent part of agency (1999). However, to operationalize Sen for education, I had to move beyond his work.

I reviewed several attempts to operationalize the CA, including Ibrahim (2011), Conradie (2013), and Warrington and Kiragu (2012) before choosing the operationalization which is arguably the one best-known in the ICT for development field (ICT4D), Kleine's Choice Framework (2007, 2010, 2011a, 2011b, 2013) (see **Figure 1.1**). In Chapter 3, I will discuss strengths and weaknesses of these different attempts and explain why I chose the CF.

**Figure 1.1**



*The Choice Framework (Kleine 2013, based on Alsop & Heinsohn 2005; DFID 1999; p.122)*

The CF framework visualizes the CA by including the main constituent parts of the approach, namely agency and achieved functionings (which Kleine (2013) refers to as development outcomes). However, the author conceives of agency as a portfolio comprised of 11 different resources: educational, psychological, financial, cultural, social, natural, material, and geographical resources, and information, time and health as resources. These resources, along with an individual's personal characteristics such as age, gender, and ethnicity, all have the power to influence a person's freedom to choose various doings and beings she may value. The development outcomes are distilled into two manifestations, choice as the primary development outcome and the valued doings and beings a person has as the secondary development outcomes. Like Sen (1999), Kleine (2013) believes that development is about having the freedom to choose, and so choice is always the primary development outcome. In this study, the primary development outcome is for the girls to have choice to increase their access to educational content after school, and the secondary outcomes are to improve their grades and have academic success as valued doings and beings, respectively.

However, building on Sen's version of the CA, Kleine also adds structure and the degrees of empowerment to the CF. The acknowledgement that a person exercises her agency within structures that are permeated by institutions, organizations, discourses, policies, programs, norms, technologies and innovations is of key importance to this study since the research context (see Chapter 4), particularly the structures the 22 research participants negotiate during the after-school hours at NDSS, on their commute home from school, and once at home, will play a role in shaping the agency the girls can exhibit as we undertake work to realize their three desired development outcomes. The degrees of empowerment are included in Kleine's (2013) CF to underscore that it is not simply enough for an individual to have choice – she must also know that it exists, sense that it is a choice for her to make, she must use that choice, and finally the choice she uses must match the desired outcome(s) she has in mind.

Together, structure, agency, the degrees of empowerment, and the development outcomes as conceptual areas in the CF form the basis for understanding the CA in a manner that is both holistic and systematic. To this end, Kleine has proposed that this analytical tool can be used to map development processes and contexts, to inform research design, and to evaluate projects (Kleine, 2013). However, critics have pointed out that the breadth of conceptual areas encompassed in the CF makes its use in these manners challenging (Stillman, 2015). In this thesis, I will use the Choice Framework in the multiplicity of ways proposed by Kleine while acknowledging Stillman's critique, and consequently focusing the analysis where possible on the most salient aspects of the framework. As a further step, I drew on this CA

operationalization to develop six subsidiary research questions (SRQs) to complement the main research question:

- ***How, if at all, might the introduction of mobile tools impact the girls' desired primary development outcome of having choice to increase their access to educational content after school? (main research question, development outcomes)***
- ***Do the girls view the mobile phone as a tool to facilitate IATECAS? (SRQ1, degrees of empowerment)***
- ***How, if at all, do norms on the use of time affect the girls' mobile use to IATECAS? (SRQ2, structure)***
- ***How, if at all, do norms on the use of space affect the girls' mobile use to IATECAS? (SRQ3, structure)***
- ***How, if at all, does access to mobile phones affect the girls' mobile use to IATECAS? (SRQ4, structure)***
- ***How, if at all, do policies, discourses, and institutions affect the girls' mobile use to IATECAS? (SRQ5, structure)***
- ***How, if at all, does the resource portfolio available to the girls affect their mobile use to IATECAS? (SRQ6, agency)***

Having situated this study conceptually, I will now provide an overview of the research process.

### 1.5. Research Process Overview

The findings of the exploratory study identified having choice to increase access to educational content after school as a development outcome desired by the girls and their advocates in the New Day Secondary School community. To evaluate the role of girls' mobile phone use to IATECAS, I designed an action research (AR) process which placed the people – in this case 22 secondary school girls – at the heart of the study, and utilized their desired outcomes as the departure point for the analysis. By undertaking an AR process, I hoped to be able to implement strategies based on CF-assisted situational examinations so that adjustments could be made to actions when and where necessary. In this way, the study was undertaken to promote expansion of the real freedoms the learners might enjoy through their research participation.

The AR process was implemented across a 13-month period between December 2013 and January 2015. The study was divided into three phases: Pre-Intervention (December 2013 to the first week of April 2014), Intervention (the second week of April 2014 to the first week of December 2014), and Evaluation (January 2015). In the Pre-Intervention phase, the actions to be taken were developed in response to the structural elements and resource-based agency components identified among the research population; in the Intervention phase, actions were taken and periodically revised through critical reflection and engagement with the CF; and in the Evaluation phase, the sum of the actions taken were scrutinized to assess whether,

if at all, the introduction of mobile tools impacted the girls' desired development outcome to have choice to IATECAS.

I used multiple research methods during the AR process which were primarily qualitative in nature, including semi-structured interviews, surveys, after-school participant observations, focus group discussions (FGDs), a research diary, a ranking and association (R&A) activity, an innovative participatory method for operationalization of Kleine's (2013) resource portfolio concept, and participatory learning and action (PLA) workshop activities. Additionally, I employed the use of quantitative data, mobile app usage statistics generated through the girls' use – or lack thereof – of two mobile tools, biNu and Worldreader, which were introduced to facilitate a new choice to IATECAS. The actual mobile app usage statistics were used to triangulate with self-reported mobile app usage data that surfaced from the qualitative research methods.

Apart from the goal of supporting 22 secondary school girls in Nairobi as they seek to have choice to increase their access to educational content after school, this study also has the aim to make contributions to how the capability approach can be operationalized in practice and through action research. Moreover, I wish to deepen understanding of girlhood and how the after-school hours are structured from the perspective of secondary school girls who experience inequalities related to their personal characteristics. Finally, with the intention to contribute to the debates in ICT4D, and information and communication technologies for education (ICT4E) more precisely, I will discuss how and why, if at all, mobile phones and two apps might be appropriated by teenage girls in ways (e.g. mobile learning or mobile reading) that might help them lead lives they have reason to value, and any challenges and enablers they might encounter as they attempt to do so. In the final section of this chapter, I will elaborate the structure of this thesis given the themes and conceptual framings articulated herein.

## 1.6. Thesis Structure

In Chapter 2, I will examine the literature in three areas with which this study is concerned: girlhood, after school experiences, and youth mobile use. These explorations will be undertaken to better understand how structure and agency can shape girls' after-school lives, and to point out how mobile phone use links to girlhood during this period. I will take the discussion of youth mobile use as an opportunity to examine the definitions of and distinctions between mobile learning and mobile reading, before critically assessing the impact of four well-documented mobile learning and reading initiatives in order to distill relevant lessons to be kept in mind as this study is implemented.

The decision to adopt the CA in this study as opposed to a growth-focused development perspective will be further explained in Chapter 3. Here, I will detail key CA terms

before investigating children, education, and ICT4D, respectively, in relation to the CA. This is because these topics conceptually inform the development process to be undertaken since the research subjects are children, the research setting is concerned with schooling experiences, and mobile technology is used to carry out the action research. Attention will then turn to time and mobility as two socially constructed concepts with links to the CA that are recurrent themes throughout the study and its analysis. I will close this chapter with reviews of possible CA operationalizations before presenting and critically evaluating the decision to adopt the Choice Framework as the applied CA operationalization in this study. Following this, I will explicate three ways the CF will be utilized in this thesis, and demonstrate how the tool was drawn upon to formulate the SRQs.

The after-school research context will be set out in Chapter 4. This analysis will occur at the macro-level, surveying the national socio-historical circumstances which gave rise to how the education system in Kenya came to be structured in the present day. I will also specifically highlight girls' education and ICT use in Kenyan education. Moving to the micro-level, I will first situate the research in the city where it was carried out, Nairobi. Then, I will map the New Day Secondary School context before elaborating further on the school population demographics and a typical schedule of a learner's school day.

Based on the analysis in the first four chapters of the thesis, Chapter 5 will lay out the methodological design of this study. The decision to assume a subjective ontology and an action research epistemology will be linked to my goal of keeping people at the forefront of the design considerations made. Utilization of multiple research methods, especially real app usage statistics, will be justified based on my desire to strengthen study findings through triangulation whenever possible. Following discussion of the sampling procedure, I will outline the three AR phases and the research methods used therein. How I undertook the data analysis, and related reflections on researcher positionality, ethics, and the study limitations, will be shared as a precursor to the subsequent three chapters, which will delve into the study findings.

This capabilities-based evaluation will begin in Chapter 6 with the identification of the structural elements and resource-based agency components that framed this study. This will be done so that when the differing degrees of empowerment in after-school choice are unpacked in Chapter 7, we will have awareness of the challenges and opportunities presented for girl child agency as the research participants navigate the structures in which they live during the after-school hours. The existence, sense, and use of choice expounded in Chapter 7 all lead to a further explanation of the achievement of choice as a type of empowerment with connections to the girls' primary development outcome. The after-school development outcomes realized in the intervention by enhancing components of the girls' research



portfolios will be distilled in Chapter 8 through numerous research participant case studies. The outcome changes that can be substantiated through evidence generated during this study will help establish, insofar as possible, the impact that the introduction of two apps had on the research participants with respect to having choice to IATECAS, improving their grades, and attaining academic success. To conclude this chapter, I will discuss further study limitations which had to be considered given the findings of the development outcomes-focused analyses.

I will conclude in Chapter 9 by summarizing the main research findings of the study, including answers to the subsidiary research questions. In doing so, I will illustrate how a holistic and systematic approach to analyzing human development phenomena can surface findings that were heretofore unanticipated yet highly influential in this context. Finally, the theoretical, methodological, and empirical contributions of this thesis will be noted before I suggest future research areas, and look ahead at how girls in the Global South may best be supported in their learning pursuits during the after-school hours given the barriers faced and the opportunities made available in the digital era.

## Chapter 2: Girls' After-School Lives and the Mobile Link

### 2.1. Introduction

In this chapter, I will locate this research in three areas of literature that I engaged with in this study: girlhood, experiences after-school for learners enrolled in school, and youth mobile use, all in the Global South. To do this, in the following sections I will highlight the human development considerations that emerged through exploration of these areas and their applicability to this research context. The goal of this literature review is to construct a narrative which serves as a foundational rationale for adopting a people-centered conceptual framework for this action research investigation with secondary school girls in Nairobi which made use of mobile technology.

### 2.2. Girlhood

During the past three decades, interest has grown in the study of girlhood and how it is negotiated and constructed (Leach, 2010). This interest has been driven by stakeholders including governments, academics, and practitioners who increasingly acknowledge that girls are a group of people that deserve separate study and attention instead of being subsumed into broader discussions about women, which was the norm up until the 1990s (Kearney, 2009). Girls develop into women, a transition often marked by their age, the commencement of their menstrual cycles, their family situation (e.g. orphaned or child-headed household), cultural expectations related to their marriage, etc. Yet, understanding the period before girls become women (whether officially or unofficially), or girls as they are *now*, is critical since both childhood and adolescence are times when myriad discourses, policies and programs, institutions, norms, technologies and innovations, and most importantly people come to shape what it means to be a girl. Accordingly, in this section I will begin by examining definitions of girlhood before exploring how girlhood in the Global South has been represented in international development.

#### 2.2.1. Defining Girlhood

Similar to the emergence of Gender and Development (GAD) in the 1970s, girlhood studies as a field developed as scholars began to critically challenge the tendency to focus exclusively on male experiences of childhood in research (Kearney, 2009). The genesis of the field also arose from disputes about the treatment of girls as a monolithic group of youth whose different, gendered experiences were unimportant to investigate; and when they were, such investigations often looked at stereotypical concerns such as girls' perceived histrionics and sexuality (C. Griffin, 2004). The need to define girlhood in terms that respected girls as a diverse group of individuals with a wide-range of experiences that impact their identity

construction became more urgent in work in the 1990s. Nevertheless, academic research prior to and after this time laid the groundwork for present discussions on the meaning of girlhood.

In one perspective, girlhood is defined as a combination of femininity and adolescence, characteristics which mutually shape one another. This shaping is itself guided by prevailing attitudes or discourses that societies hold about girls, and this in turn influences their identities over time:

[...] Femininity and adolescence are subversive of one another [...]; young girls' attempts to be accepted as 'young women' are always liable to be undermined (subverted) by perceptions of them as childish, immature, or any other of the terms by which we define the status 'adolescent'. (Hudson, 1984, p. 31)

Elsewhere, girlhood is defined as a confluence of globalization and capitalism made up of commodities, information and capital which flows unevenly to and from gendered subjects: "‘Girlhood’ [is] a site that consolidates assumptions and practices regarding difference, colonial power, and economic relations between and among gendered subjects in transnational contexts," (Weems, 2009, p. 59). In geography, Bettis and Adams (2005) define girlhood by the context in which it is enacted, asking not only who girls are but where they are. The authors argue that the places and spaces that girls traverse are crucial to their identity construction:

The girls' understandings of where they are, who they are, and who they can become are [...] typically complex. [...] The "emergent identities" of the girls [...] asserted themselves in a variety of spaces, particularly those that they controlled. Who they were also shifted according to the spaces they inhabited and how they used these spaces. We see the concept of place as illuminating various facets of the identity work of the girls [...]. (Bettis & Adams, 2005, pp. 3–4)

The authors further raise the importance of 'in-between' places and spaces in the context of schooling and their centrality to how girls make themselves, noting that outside of home and school, there are multiple points where processes including technologies, politics, inclusion, exclusion, and relationships (power and hierarchies) are developed and inevitably reproduced when girls are inside their homes and schools (ibid.): One example they use is school buses, a place where social hierarchy – and even popularity – can be determined. They also highlighted a case study in which two teenage lesbians transformed the internet into a virtual meeting space, connecting with other girls to combat homophobia in their schools.

A number of scholars in girlhood studies have problematized the comparative lack of representation of girls from diverse places, ethnicities, sexualities, and socio-economic backgrounds, to name a few differences (Bettie, 2014; C. Griffin, 2004; Hernandez & Rehman, 2002; Weems, 2009). The homogenization of girlhood experiences in favor of girls primarily from Global North contexts and from groups who have traditionally held power based on their various socio-spatial, racial, economic and cultural affiliations has meant that girls who are not

a part of a dominant group are yet to be well understood through research. Therefore, the definition of girlhood that I will adopt in this thesis is one which intentionally foregrounds many of these elements of difference and links these differences to explore what girlhood is like for those who have been underrepresented in the field. Although the definition originates from researchers examining girlhood in a multicultural Canadian context, I find the definition to be relevant for a multicultural Global South context in Kenya as well: "...Childhood is always a *gendered, raced, sexed and classed* [original emphasis] space, inscribed by particular behavioural dictates, social norms and mores and ways of seeing the world. It is also context-bound; rooted in language and the politics of location," (Jiwani, Steenbergen, & Mitchell, 2006, p. x). In this definition, structural elements and resource-based considerations, including place, are made possible when working to understand the various realizations of girlhood encountered during this study with girls in Nairobi.

### 2.2.2. Representing Girlhood in the Global South

Attention to children and youth in international development started to become popularized when the United Nations declared 1985 to be the International Year of Youth. Soon after, a specific focus on girls arose: In 1990, UNICEF led the World Summit for Children which culminated in the next ten years being declared the Decade of the Girl Child. Five years later, the Beijing Platform for Action designated "The Girl-child" as one of its 12 strategic objectives and actions (UN, 1995). It is within this platform that development discourses about girlhood in the Global South were enshrined on an international scale, and the narrative portrayed was one in which girls were often portrayed as victims.

In her thesis which examined the construction of discourses about girlhood in international development, Campeau (2006) traced how, starting in the 1980s as part of the GAD approach, work to mainstream gender in development began moving away from welfare- and modernization-based notions of development for women. Yet, when girls were the subject of consideration, such discourses remained firmly entrenched and were pervasive throughout the literature. Initially, language about girls in international frameworks positioned them as uncomplicated individuals with needs for education, health, and protection from violence and exploitation. Girls were also dependent on adults and processes of development to meet these needs (ibid.). This characterization of girls was one that placed them in a state of perpetual vulnerability. It also suggested that girls needed to be rescued by neoliberal institutions, policies, and programs which were being concocted in response to needs identified by adults. Furthermore, this listing of what girls want narrowly confined their aspirations to areas which international development actors believed the girls needed. This is problematic because girls are infrequently asked what they value in their own lives, so desires such as 'access to

education' are mapped onto girls, often without first being critically interrogated to understand if this access is actually desired or why they want this access.

Eventually, this prescriptive approach to girls' development gave way to a rights-based perspective which invoked empowerment to realize girls' development. The United Nations Foundation (UNF) along with a coalition of other UN agencies and multilateral organizations in 2003 initiated a project called 'Meeting the Development and Participation Rights of Adolescent Girls'. The aim of this multi-country initiative was to transform the experience of girlhood by empowering girls to exercise their rights to "...promote their survival and personal development, including health care, education, life and livelihood skills and vocational training," (UNF, 2003, p. 2). The objectives for girls' development remained relatively unchanged, but the discourses which drove this development had evolved to redress power imbalances so that girls might achieve life improvements in areas others thought they needed it.

Girls in the Global South continued to be represented in a manner which conveyed the message that they are homogenous and have few life choices available to them. A prominent example of this limiting representation of girls is in the Girl Effect initiative launched in 2008. Led by the Nike Foundation, the wording of the project and its aims has been decried as growth-focused and paternalistic. This is because it is thought that the initiative pushes the realization of 'girl power' through formal education so girls can develop skills which leads to jobs where they earn money and provide for their families (Switzer, 2013). In other words, girls' education is a means to a very specific, singular end: income generation. Issues raised about this girl effect<sup>3</sup> approach to girls' empowerment include that it encourages investment in education and upskilling mostly so that girls and young women can (better and often solely) contribute to economic development (Hickel, 2014). This stance misrepresents the full range of development outcomes that girls and young women value.

The current wave in how girls are represented in the Global South was marked by the UN General Assembly's introduction in 2012 of the International Day of the Girl Child. This day was created to "...recognize girls' rights and the unique challenges girls face around the world," (UN, 2016). Most of this agenda remained the same as the empowerment-themed push seen in the 2000s. However, mass adoption of social media platforms provided a new tool for awareness-raising efforts about the plight of girls. Perhaps the most famous example of this was the "Bring Back Our Girls" Twitter hashtag campaign launched during this study in April 2014 when girls from Chibok, Nigeria were kidnapped from school by terrorist group Boko Haram. The campaign drew support from Malala Yousafzai, by then the world's best-known advocate for girls' education in the Global South (Gibson, 2014). Yet, just six months later, the

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<sup>3</sup> The Girl Effect as a project soon became synonymous with the general descriptor 'the girl effect,' meaning the results anticipated when girls are empowered through education.

campaign was deemed a failure and global attention moved to the bigger global threats posed by terrorist groups such as Daesh, leaving the Chibok girls and their challenges by the wayside (Ogene, 2014). The Chibok situation helped perpetuate the idea of girls in the Global South needing protection (in this case from violence) as they attempt formal education participation.

Overall, girls have remained relatively excluded from steering the agendas, or otherwise contributing to, the development work that is supposed to be for their benefit. Nevertheless, girls in the Global South are increasingly gaining access to various media to tell their own stories (Bosch, 2011; Caribou Digital, 2015; Kearney, 2006; Mazzarella, 2010; Skalli, 2014). Female researchers in the Global South are also analysing and sharing their own experiences of girlhood and/or those of others like them (Amin, 2009; Khau, 2011; Moletsane, Mitchell, & Moorosi, 2011; Ngoshi, 2011; Ntombela & Mashiya, 2009; Oduor-Ombaka, 2010; Oyoko, 2006). In doing so, the narratives of girls as victims of gendered society are being increasingly challenged. This work is bolstered by academics and practitioners from the Global South and beyond who conduct studies which involve girls in a manner where they can represent themselves; some even credit girls as co-authors of the literature published (Jiwani et al., 2006; Kearney, 2009; Mazzarella & Pecora, 2001; Porter, Hampshire, Bourdillon, et al., 2010).

### 2.3. After School

As evidenced in the preceding section, examinations of girlhood experiences in the Global South reveal that international development actors place a substantial emphasis on education as a mechanism for girls' development. This focus has concentrated on girls' experiences at school and during the formal school day, while the hours spent after school in settings that include home and places in-between have received comparatively less consideration. These circumstances persist despite the increasingly porous geographic boundaries, both real and imagined, that exist between home and school. Accordingly, in this section I will investigate the significance of the after-school experience for youth enrolled in school in the Global South. I will then unpack after-school experiences from different countries in the Global South by looking at the gendered differences in time use to learn, work, and to engage in leisurely pursuits.

#### 2.3.1. The Significance and Structuring of After-School Hours

The period when the formal school day ends has alternately been referred to as after school, extracurricular, co-curricular, extra-class, and non-class (Blatchford & Mortimore, 1994; Feldman & Matjasko, 2005; Gholson & Buser, 1983; Hollister, 2003; Ieorge & Thinguri, 2013). In this thesis, I will refer to this period as after school or after-school hours. This is because the other terms make explicit links to the classroom or formal learning curriculum whereas 'after

school' is inclusive of all types of learning activities and places other than those strictly associated with formal education.

After school is the time when students enrolled in school are usually expected to engage in activities which enhance their development. These activities may or may not have direct links to the formal education curriculum (Posner & Vandell, 1999), and can be broadly classified as formal, non-formal, or informal learning activities. In this thesis, while the constituent parts or merits of the three learning types (formal, non-formal, and informal) will not be debated, it is worthwhile to define these terms as they will be understood here because this typology will be applied on occasion to describe activities and content that occur after school in this study with 22 secondary school girls in Nairobi: Formal learning refers to learning is facilitated by an official institution responsible for education provision, and usually leads to a recognized certification. Non-formal learning often does not lead to certification but is structured, provided by an education and/or training institution, and usually follows a prescribed curriculum that can impart a skill. Informal learning is largely unstructured, sometimes incidental in nature, and participation can occur through work, play, and leisure; what is learned in this case is usually self-directed by the learner (Colley, Hodkinson, & Malcolm, 2002; European Commission, 2001).

After-school activities are arranged by schools, churches, community-based organizations, parents, and even learners themselves (Mahoney, Larson, & Eccles, 2005). Funding for after-school activities can come from one source or a combination of sources to include governments, families, school communities, school faculty and staff, or the learners' self-funding (*ibid.*). The benefits of after-school activity participation have been sought as part of an increasingly common understanding in the 21<sup>st</sup> century of youth as a time when people are undergoing development that will have an impact on their future lives, and not just as a time when problems need to be managed by adults (Lerner, 2005). From a human development standpoint, participation in after-school activities is often desired by school community stakeholders for the benefits attributed to this participation, including:

- avoidance of engaging in anti-social behavior, especially for urban and economically disadvantaged youth (Vandell et al., 2005);
- promotion of positive, healthy, and holistic personal development (Lerner, 2005);
- skills development not or inadequately addressed in the formal school curriculum such as socio-emotional intelligence and citizenship (Mahoney, Larson, Eccles, & Lord, 2005);
- increased physical fitness where athletic activity is involved (Beets, Beighle, Erwin, & Huberty, 2009); and even
- improvements in academic performance in formal schooling (Shernoff, 2010).

While the benefits of after-school programming vary based on factors such as learners' socio-economic profiles, school characteristics, and the structure and types of after-school activities made available, it is generally agreed that some form of participation during this period can contribute to a learner's overall well-being (Riggs & Greenberg, 2004). For girls enrolled in school in the Global South, after-school participation in organized activities has also been found to promote positive changes in gendered norms as well as strengthen girls' inclusion in formal schooling (Unterhalter et al., 2014).

Nonetheless, in school communities where poverty is rife, after-school programming does not always contribute to holistic youth development. For instance, a phenomenon known as 'shadow education' is pervasive: Private supplementary tutoring takes place during after-school hours, and sometimes on non-school days (Bray, 2007). Shadow education is a mechanism whereby school subjects whose mastery is crucial to learners' successful performance are taught for additional time – often at a cost. It is not uncommon for the providers to be the same teachers from whom students learn at school, and it has been found that the extra income they can earn may serve as an incentive for them to provide poor instruction during the school day (Jayachandran, 2014).

Apart from tutoring, sports (Massao & Fasting, 2003), guiding and scouting (Proctor, 2009), and clubs for science, health, and other social interests (Dunne, 2007; Jere, 2012; Okaya, Horne, Laming, & Smith, 2013) are additional after-school activities. Students might also be asked to contribute to the school grounds maintenance after school due to a lack of funding to pay cleaners (Silo, 2009, 2011). The diversity in the type and amount of after-school activities depends on affordability: The overall school community socio-economic status impacts the activities facilitated on school grounds. An individual learner's family socio-economic status affects their ability access to after-school activities offered away from school grounds (sports tournaments, for example) and without school-based supervision (Ssewamala, Karimli, Han, & Ismayilova, 2010; Wegner, Flisher, Chikobvu, Lombard, & King, 2008).

In a few Global South contexts, after-school programming begins on school grounds at 3:30pm and usually concludes at 6pm. After this period, after-school activity generally shifts into the home. Once home, there are a few differences in how girls allocate their time when compared to boys.

### 2.3.2. Gendered Time Use during After-School Hours

Gendered time use differences during the after-school hours have been noted among schoolchildren in the Global South. A family's socio-economic status is frequently identified as a primary indicator of how girls spend their time once the formal school day ends. Time use trends across countries and between urban and rural contexts for children enrolled in school are also shaped by structural elements such as discourses, norms, institutions and



organizations, policies and programs, and technologies and innovations. I will broadly categorize the time learners spend after school, and when they are not eating or sleeping, into the following activity groupings: work, play/leisure, and learning/studying.

Gendered norms on time use appear to be an influential factor for the type of after-school activities in which girls can participate and the time they can spend engaged in an activity. While unpaid domestic labor can be useful for cultivating organizational skills and instilling a sense of responsibility, these activities still inculcate norms that can limit a girl's overall development. This is because as girls age, they are expected to make substantial contributions to the reproductive work carried out by women in their household, including resource (water, firewood, etc.) collection (Kes & Swaminathan, 2006).

Leisure time after school can be described as time when a girl is not working or engaging in a formal learning activity. Activities during leisure time are overwhelmingly self-selected and self-directed by the learners themselves. Examining data from Kenya, South Africa, Pakistan, India, Guatemala, and Nicaragua in the after-school hours, Ritchie, Lloyd and Grant (2004) found that, compared to boys, adolescent girls enrolled in school enjoy less leisure time and have heavier workloads. In a quantitative study that aimed to assess what, if any, association there was between school enrollment, sex, and the leisure time available after school, Lloyd, Grant and Ritchie (2008) found a significant association in Pakistan and South Africa when they analyzed the amount of leisure time girls who lived in urban locales had after school when compared to boys – girls were usually afforded less time for leisure activities. Urban schoolgirls possibly have less leisure time because of adult expectations that any “free” time will be spent studying. Evidence from the Kenyan context was found to corroborate this supposition based on the Lloyd et al. (2008) study: In two studies which investigated gendered time use after school among communities in and near Nairobi, it was observed that adult stakeholders placed a strong emphasis on studying and learning after school to increase girls' academic success (Abuya et al., 2013; Njeri, 2012). Often, this focus was at the expense of possible participation in other after-school activities. However, because girls' education beyond primary school often represents a substantial financial burden for low-income families in Kenya (Warrington, Fentiman, & Kiragu, 2011; Warrington & Kiragu, 2012), there likely existed great pressure for the girls to realize returns on investments made to put them through secondary school.

The studies above demonstrate that work and (usually formal) learning far outstrip leisure time after school in Global South contexts, particularly when a family's financial resources are limited. At the same time, the studies highlight how structural elements, including parent expectations, affect girls and the after-school activities they are permitted to

participate in. These norms can also shape girls' ability to appropriate mobile phones after school for reasons they might value, as will be seen in the next section.

## 2.4. Mobile Use

At the start of the 21<sup>st</sup> century, telecommunications access in sub-Saharan Africa was extremely low when compared to more developed contexts: "At that time there were more telephone landlines in Manhattan or Tokyo than in all of sub-Saharan Africa," (Carmody, 2012, p. 24). However, as the mobile industry began to grow exponentially, between 2000 and 2011 the number of subscribers in Africa skyrocketed from 10 million to nearly 650 million (ibid.). Indubitably, youth in SSA became a part of the so-called mobile revolution, their initiation as mobile phone owners sometimes begun when they received a used phone from a relative or a significant other (Napolitano, 2010; Rangaswamy & Cutrell, 2013).

With access and ownership came increased mobile use. For adolescents enrolled in school, the interplay between structural elements – most notably mobile technologies and innovations with discourses, norms, institutions and organizations, and policies and programs – eventually became a significant part of their after-school experiences. To explore this phenomenon, I will now share some ways youth enrolled in school in the Global South have used their mobile phones. The concepts of mobile learning and mobile reading will be spotlighted and defined in this discussion as well. Subsequently, I will probe girls' mobile access to understand how and why it has been characterized by various gendered constraints and enablers.

### 2.4.1. Youth Mobile Use in the Global South

Discussing how youth navigate their childhood experiences in SSA, Christiansen, Utas, and Vigh (2006) assert that: "Globally, youth are especially committed to new techniques of learning, earning and communicating as ways of gaining life chances. Technological inventions such as the mobile phones are examples of such," (p. 20). Here, the authors linked mobile communication practices to learning and studying, working, and leisure activities. The authors' statement therefore dovetails with the three categories of youth after-school activities that have been threaded throughout this chapter. Youth mobile uses across Global South contexts will now be surveyed based on these categories.

#### *2.4.1.1. Mobiles for Work*

Given the economic hurdles many families in developing contexts face to send their children to school, it is not uncommon for youth to engage in paid employment to contribute financial resources to their education and overall household maintenance. Using a mobile phone for work after school can take a few forms, but what has primarily been seen is youth selling mobile-related products, using the device to seek employment, and/or staying in contact for

employment opportunities. In Burkina Faso, the creation of new jobs linked to the mobile industry has created opportunities for entrepreneurial youth to fund their schooling: “Selling cards in one’s neighbourhood is also very popular among pupils during their summer holidays. Some of them even manage to earn enough money to help their parents or to pay their school fees on their own,” (Hahn & Kibora, 2008, p. 96). Halewood and Kenny (2008) also note a case from Bangladesh where young people enrolled in school have worked to sell phone credit. A study of youth mobile practices from Ghana, Kenya, and Uganda found that youth use the technology to conduct job searches and facilitate access to new income-generating opportunities (Caribou Digital, 2015). Work has also been used in the reverse by youth in secondary school in India to fund mobile phone purchases so that they can then engage in learning and/or leisure activities (Rangaswamy & Cutrell, 2013).

Souktel is a digital solutions provider that was an early innovator in mobile use for employment in challenging contexts – Palestine was one of these places. Accessing information about job opportunities is difficult in Palestine due to several cultural norms and mobility restrictions that arise given the geopolitical situation with Israel. Yet, an SMS-based service Souktel created offers help by matching youth to employment prospects they might not otherwise hear about: “Anas, a recent graduate, shared the same view: ‘I think what Souktel is doing is one of the few actually-efficient ways to help people get job information,’ he added. ‘I hope to keep getting digital work assignments through the service’,” (Souktel, 2014). Discussing young workers who have already left school, Porter (2013) corroborates the idea that mobile phones can be used to circumvent mobility restrictions to enable youth to conduct business which might enhance their livelihoods.

#### *2.4.1.2. Mobiles for Play or Leisure*

The practice of youth after-school mobile use to engage in play or leisure has been the subject of only a few studies to date in the Global South. This is because development work with poor people in these contexts has focused on specific sectors such as health and education, often with an overt growth-based focus (Arora & Rangaswamy, 2013). Project and programs, including those which integrate technology, rarely address an individual’s right to choose to enjoy time relaxing, playing games, socializing, or participating in activities that enhance their lives in ways that cannot be measured by purely economic development indicators (Roggemann, 2014).

Youth mobile use after school is often presented in a binary format: useful or useless, with play and leisure being categorized as the latter. Sey and Ortoleva (2014) argue against this notion, opining that “...the growing use of email or SMS for social relations may affect the width and structure of social groupings and may influence the spread of literacy in a way that may be partially independent of formal schooling,” (p. 9). From a human development

perspective, play and leisure – ‘useless’ time – could still be part of a life someone values, and even useful if it helps them engage in activities that make them happy.

Mobile use that facilitates youth social relations can take many forms, including: common hashtags shared on Twitter, the generation of memes, photo exchanges, or discussions on Facebook about topics of mutual interest. Since social media use among school-going youth has increased in the past decade, one (perhaps unanticipated) way that mobile has been used is to advocate for youth rights by providing a medium for self-expression. Youth mobile appropriation for political advocacy is also thought to have added to actions youth took on the ground to propel socio-political change within and beyond sub-Saharan Africa and the Middle East, for example during the Arab Spring (Iwilade, 2013; Skalli, 2014; Tully & Ekdale, 2014).

Game play also figures prominently in youth after-school mobile use. Mobile games represent a mechanism for relaxation and enjoyment. Research in South Africa and Kenya has found that mobile games, especially those built into handsets are often played in the evening after school (iHub Research & Research Solutions Africa, 2012; Walton & Pallitt, 2012). In India, youth enrolled in school have described mobile games as a way to pass time. Yet, because of prevailing attitudes in the Global South that adult stakeholders have about how students should use their time after school, and worries about maintaining limited resources within the household (specifically financial resources for charging mobile batteries or top-up credits), youth mobile use for gaming can be restricted (Porter et al., 2015).

In an ethnographic study of mobile use in Tanzania, Molony (2008) found that youth use the device as a resource to communicate their social status to their peers, particularly if located in a rural area where the device may not have been widely available. In India, mobile has been used by families, including their children, to collectively send texts in response to opinion polls offered on popular TV shows as a form of social participation through other mass media (Rao & Desai, 2008).

However, not all youth mobile use after school for social purposes is positive: In West and Central Africa the technology has been used to spread false rumors about the existence of mobile phone numbers that can kill people (Bonhomme, 2012): In 2004 in Nigeria, two youth collapsed after taking phone calls from an unknown number. Despite being a random coincidence, their deaths resulted in a rumor being spread that there are phone numbers that can kill people if a person answers a call from such a number. This social phenomenon, even if untrue, caused anxiety and fear of mobile phones among a population at a time when the technology was just beginning to come into popular use. The viewing and sharing of pornographic materials is another negative social use of mobile technology that has been decried around the globe. Mobile contributes to the increased availability of such materials,

when compared to other, long-established but perhaps less easy-to-share media such as magazines (Nthoiwa, 2010; Porter et al., 2012).

It has been observed that as new technologies diffuse, people are often suspicious of the effects of their introduction. Moreover, in the Global South, local media frequently catalog the impact of mobile introduction in a manner which accords blame to the technology when problems arise (Mudhai, 2011). The media then contributes to the belief among adult stakeholders, whether true or not, that technology alone is the cause of seemingly emergent activities considered to be undesirable societal ills (Hahn & Kibora, 2008). Thus, youth mobile uses that are social in nature, and which may not conform to societal expectations, are more likely to be seen as subversive. A common solution applied when this 'subversive' appropriation occurs is to try and limit youth mobile use to 'useful' or 'productive' purposes such as learning or studying.

#### *2.4.1.3. Mobiles for Learning or Studying*

Youth after-school mobile use for learning and/or studying is being proposed by researchers as a mechanism to help meet educational needs that remain unfulfilled by governments. The potential of this type of mobile use has been explored in mobile learning, of which mobile reading is a subset. The definition of mobile learning has evolved as time has progressed, and innovative ways of appropriating mobile phones to learn have similarly proliferated.

Early definitions of mobile learning emphasized the technology before eventually recognizing the learners' role and their mobility as influential factors in defining what this learning activity is (Crompton, 2014; Traxler, 2010a). However, these definitions also noted that: "...formal education cannot provide people with all the knowledge and skills they need to prosper throughout a lifetime. Therefore, people will need continually to enhance their abilities, in order to address immediate problems," (Sharples, Corlett, & Westmancott, 2002, p. 220). The implication here was that learning could not be limited to classrooms and school hours, and should instead be envisioned as a process that can also occur during after-school hours and beyond the conclusion of formal schooling attendance.

Other researchers have inserted a social constructivist perspective into discussions on what mobile learning is. Zurita and Nussbaum (2004) suggest that mobile devices can create spaces where knowledge can be constructed among learners through collaboration. The social constructivist mobile learning perspective has given way to more participatory research methodologies, whereby researchers investigate how mobile learning might facilitate the co-construction of meaning by linking social activities that occur in- and out-of-school (Buchem & Camacho, 2011). Camacho (2013) also states that because of the affordances that mobile technology makes possible for people (e.g. connectivity, untethering people's movements, etc.), areas like mobile-based social networks have a real opportunity to promote community-

building in classrooms and outside of traditional learning settings. These communities could then transform the type of content available to learners since people and their peers can participate in generating content themselves (ibid.). Despite the social constructivist turn in mobile learning, a study conducted in Bangladesh and Sri Lanka found that learners still felt the need for guidance from a more knowledgeable and/or experienced instructor (Andersson & Hatakka, 2010). This suggests that learner collaboration that can take place with mobile learning should also involve a person who can serve as a guide to promote and enhance knowledge construction.

Mobile reading as a derivative of mobile learning has primarily been defined as reading on mobile devices (Baron, 2013a; West & Chew, 2014). But similar to the evolution in defining mobile learning, mobile reading has also evolved: "The best definition of 'reading on a mobile device' may therefore be 'reading on a digital platform that the user perceives to be easily portable,'" (Baron, 2014, p. 225). Mobile reading through a digital technology medium is usually enacted with e-books, or electronic books. The definition of what e-books are has been debated as the popularity of digitizing print-based texts has grown (C. Lynch, 2001). Nonetheless, in an attempt to pull all the available definitions of e-books together through an extensive literature review, Vassiliou and Rowley (2008) put forth a two-part definition meant to encapsulate the wide range of interpretations of what e-books are:

- (1) An e-book is a digital object with textual and/or other content, which arises as a result of integrating the familiar concept of a book with features that can be provided in an electronic environment.
- (2) E-books, typically have in-use features such search and cross reference functions, hypertext links, bookmarks, annotations, highlights, multimedia objects and interactive tools. (p. 363)

Because of its comprehensiveness and that it captures functional elements present in one of the technical tools (Worldreader) used in this intervention to help increase access to educational content after school, I will adopt Vassiliou and Rowley's definition of e-books in this thesis. However, an e-book here might be thought more of as an *m-book* since the reading documented in this study will occur via mobile devices and the use of mobile apps.

Given that reading is an activity agreed to be educational in nature, considering mobile reading as a branch of mobile learning is plausible. Nevertheless, I acknowledge that not all reading is for learning, as people often read for leisure. As such and based on the preceding discussion, in this thesis I will apply the following definitions for mobile learning and mobile reading: Mobile learning is a person's use of a portable digital technology to enhance their skills or knowledge. The person engaging in mobile learning can do so on-the-go or remain in one place. This learning can be enacted at any point during a person's life once they have acquired the knowhow to appropriate mobile. The usage does not have to be bound by time or place, although a user's context may shape these aspects of the activity. Mobile reading is a

type of mobile learning activity which can be enacted with/in the same conditions as mobile learning, but which focuses on a person's consumption of text by sight or touch. Mobile reading can be done for learning and leisure.

#### *2.4.1.4. Mobile Learning Projects and Programs*

In section 2.3.1. of this chapter, I previously described how the period after school, even in income-poor countries, often includes supplementary tutoring organized around academic topics. One example of this learning offered on mobile is MoMaths in South Africa. MoMaths, funded by mobile handset manufacturer Nokia, was trialed in secondary schools with approximately 4,000 learners. Through this project, secondary school learners were supported in- and out-of-school with mathematics revision (Embassy of Finland Dar es Salaam, 2014). The service was free and enabled grade 10 math students to answer up to 10,000 different questions from a database and get feedback on their answers via existing mobile social media platforms.

When the project was evaluated in 2010, however, it was seen that only 656 learners regularly used the service from January to June of that year (Vänskä, 2011). Gains were documented among these learners' math test results but there was insufficient evidence to strongly conclude that these changes were because of the MoMaths intervention (ibid.). Furthermore, qualitative analysis to develop a holistic understanding of the outcomes documented was limited, given the large number of students engaged for the study. In contrast to this experience, in this study I will blend quantitative and qualitative research methods to triangulate any findings that emerge. I will also conduct this research with a smaller population of 22 people, that is more manageable given the time available, and to help achieve a degree of analytical depth.

While mobile learning and mobile reading have been positioned to support the formal learning needs of secondary school students, including mathematics support in mother tongue languages (Jantjies & Joy, 2015), math tutorials with games (Kalloo & Mohan, 2012), and after-school homework support by voice and SMS (Reid & Pruijsen, 2015), mobile has also been used elsewhere for non-formal and informal learning purposes:

In Bangladesh, the BBC *Janala* initiative aims to improve the English language skills of poor people, with mobile being one of four media appropriated towards this end (Cotter & Ashraf, 2012). Using interactive-voice response (IVR), BBC *Janala* users can listen to English language instruction and take assessments to test what they have learned. Mobile use in this project can be considered non-formal in nature since it is not mandated by the national curriculum and the learning carried out is self-guided by the users but framed by a curriculum developed specifically for the project. Part of the outreach efforts for this initiative focus on adolescents between the ages of 15-19, including children enrolled in secondary school (Tyers,

2012). The *Programa Nacional de Alfabetización* (National Literacy Program) in Colombia is a non-formal mobile learning initiative which intends to provide an alternative and flexible opportunity for youth and adults over 15 years of age to engage in literacy-building activities. Interactive content for this purpose is pre-loaded onto SIM cards and is accessible with or without connectivity. This project adopts a self-directed learning intervention design for people who are illiterate in the Spanish language (Lugo & Schurmann, 2012).

Both initiatives reported improved outcomes among a substantial number of users: By 2014, BBC Janala had reached 542,000 students, which was 2,000 more than expected for that period after launching in 2008. Furthermore, 34% of these students increased their basic English language competence when compared to baseline testing, exceeding the target rise of 5% (DFID, 2014). Between 2012 and 2016, more than 400,000 people in the Colombian case were designated as literate since the national literacy initiative launched (Colombia Ministerio de Educación, 2016). The Colombian government also stated that it is on track to eradicate illiteracy throughout its territory by 2018.

At first glance, these accomplishments are laudable given the numbers reached through the interventions and the accompanying outcomes. However, the self-directed nature of the interventions, their availability to the general public (as opposed to a specific study group), and in the case of BBC *Janala*, use of multiple tools beyond mobile, made it difficult to know what, if any, direct impact the mobile component of the interventions had on English language learning and Spanish language literacy development, respectively. Additionally, my searches online in English and Spanish for mobile usage data from these projects, which could have bolstered the suggestion that mobile use contributed to project aims, were fruitless. Without such data, the transparency of the project evaluations is lowered and questions abound as to whether integrating mobile in the design was a worthwhile use of limited resources. In my study, I will share the actual usage statistics from the mobile component of the intervention not only to better assess project efficacy, but also to more closely examine the role that mobile played in any outcomes documented.

Another mobile learning project that targets teens, including those enrolled in secondary school, is M4Lit. M4Lit, also referred to as Yoza, is a mobile reading and informal learning initiative in South Africa that features content, some user-generated, on a variety of topics:

Since its inception Yoza has evolved into an online library of m-novels<sup>4</sup>, short stories, classic literature, and poetry written by local authors. By September 2011, thirty m-novels, five Shakespearean plays and eleven poems were available for download. Genres include teen issues, romance, sports, adventure, drama and poetry. (Isaacs, 2012, p. 25)

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<sup>4</sup> An m-novel is a novel able to be accessed and read through a mobile phone.



In 2010, there were approximately 63,000 M4Lit subscribers (Vosloo, 2010b), despite being available on the Mxit platform which had in the same year, by the company's own account, 27 million registered users, many of whom were youth (S. Thomas, 2015). This project ran until 2013 with funding for maintenance from a South African foundation. However, by 2016, the project had been inactive since 2013, and content from the project was archived and transferred to FunDza, a mobile reading platform run by a non-profit and funded by donors (Vosloo, 2016).

The number of active users among the M4Lit subscribers was never revealed, and methods for counting page views to determine the content read were all devised through extrapolation (Vosloo, 2011). Furthermore, the project was not externally evaluated by an independent party, and the evaluation conducted by the project funder only employed surveys, focus groups, and exercises to assess the platform's usability with an unknown number of users (Vosloo, 2010a). Despite this, a review of the M4Lit project website<sup>5</sup> makes considerable claims about the positive impacts, backed primarily by presentations made by the project implementer in prestigious international forums, press releases garnered by the project, and user comments. In a number of ways, M4Lit contributes to the rampant 'techno-optimism' seen in ICTs for education (ICT4E), or the idea that technology will easily solve deeply rooted problems, often for people who are poor or otherwise marginalized (Schulte, 2015).

Of the initiatives recounted thus far, only the *Programa Nacional de Alfabetización* in Colombia has been funded directly by the national government. This funding is being provided until the program completely meets its intended objective of making every Colombian literate. All other projects and programs were funded by academic institutions as part of formal research studies, international aid agencies, or by the private sector. These outside sources provided limited funding for a specified period, have few, if any, sustainability mechanisms in place, and/or are promoted by profit-driven interests which may not always align with the lives that the intended project beneficiaries have a reason to value. These projects contribute to rampant 'pilot-itis', or the launch of numerous relatively small-scale initiatives that have limited impact. They are often techno-optimistic and praise the purported affordances of mobile technology even before the project or program has launched. Finally, such initiatives usually do not critically interrogate important issues of equity as it relates to use of technology as a solution to respond to (wo)man-made challenges which have persisted for decades and are not just the result of a lack of technology access (Trucano, 2010).

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<sup>5</sup> Please visit <https://m4lit.wordpress.com/> for reference.

Still another aspect of education interventions that make use of mobile technologies that is frequently overlooked by project implementers are questions of cost effectiveness. Cost effectiveness is primarily concerned with understanding if adopting technology to address a challenge in an educational setting is possible for a lower cost than other, including paper-based, approaches to addressing the same challenge (Hjeltnes & Hansson, 2004). A mobile reading project in Kisumu County, Kenya implemented in 2013 examined cost effectiveness through a randomized controlled trial with three treatment groups in different parts of the county: one group where only tutors who supported teacher training efforts received a tablet with educational materials to help them coach teachers involved in primary school level math and reading instruction; another group where all teachers received tablets pre-loaded with lesson plans and instructional aids to support their primary school level math and reading instruction; and the third group where both teachers and students received e-readers with textbooks and other learning materials to support learning in math and reading (Piper, Zuilkowski, Kwayumba, & Strigel, 2016).

The study findings showed that every treatment group had statistically significant improvements in English and Kiswahili reading. However, the tutor tablet and original paper-based approaches to increase reading fluency among learners were the most cost effective in terms of the gains learners made relative to each dollar spent on the intervention. The study illustrates that although mobile technology can be used to realize desired learning gains, it may not always be the best use of the (often limited) funds available to undertake an educational intervention. Consideration of cost effectiveness can also provide insight into whether an educational technology intervention will be sustainable in the long run given the resources present in the context of its enactment.

With awareness of these critiques of previous mobile ICT4E projects, I will conduct this study by focusing primarily on the development outcomes that the research participants aspire to achieve. This study will also engage with elements of sustainability by examining how, if at all, the resources available to the research participants might affect their ability to use the proposed mobile solutions on a long-term basis. Finally, while I will conduct an evaluation of the project's efficacy myself, I will work to minimize my influence in outcomes reporting by:

1. using the direct feedback of the girls wherever possible,
2. drawing from multiple data points (triangulation) before arriving at a conclusion which will then be (in)validated by the research participants, and
3. by integrating and sharing objective quantitative data from the app usage statistics.

While the above mobile learning and mobile reading initiatives undoubtedly have noble aims, too little attention has been given to developing a holistic understanding of the phenomena

observed. This includes a lack of examination into how users' personal characteristics, including their gender, might have impacted the documented outcomes.

#### 2.4.2. Girls' Mobile Use in the Global South

Schoolgirls in the Global South face challenges to after-school mobile use that their male peers often do not experience. The global gender gap in mobile access is perhaps the biggest constraint since to make use of mobile, a girl must either own or be able to borrow one (GSMA Connected Women & Altai Consulting, 2015). The reasons for this gap include a lack of financial resources (i.e. money to purchase a handset), but also many barriers derived from social norms such as a girl being refused permission to own a mobile phone, lacking technical skills to appropriate it, or even fear of being harassed online (ibid.).

Aside from these structural elements which shape mobile access, discourses about girls' use of mobile phones in the Global South have varied significantly: A study from South Africa found that adolescent girls use the device as a vital tool for identity construction (Bosch, 2008) and self-expression (Bosch, 2011) – however, this is not to say that girls were not previously involved in processes of identity construction and self-expression. But Bosch's (2008; 2011) studies do provide examples of the trends seen elsewhere (Gasser & Cortesi, 2016) in which children are increasingly engaging in these processes through mobile phones as they gain access to the technology. In this way, mobile appropriation creates a potential digital means through which girls can exercise their rights to expression and association (OHCHR, 1990), which in some instances could contribute to their ability to lead lives they have a reason to value.

Yet, there have been negative discourses perpetuated about girls' mobile use in the Global South as well. In Cameroon, a study was undertaken for Council for the Development of Social Science Research in Africa (CODESRIA), a long-established Pan-African research body funded with partial support from the Rockefeller Foundation. This investigation considered the ways that teen girls in the Molyko neighborhood of Buea town, Cameroon use their mobile phones. The methodology focused on finding out why the girls preferred "the cutest phones," or those phones that would be most appealing based on their appearance (Mokake, 2009, p. 5). The researcher allegedly found that girls use the devices to attract men, to escape parental control, and to gossip (ibid.). These findings were based on a research period of an unknown length, interviews with 15 girls, personal observations of the male researcher, and content analysis of advertisements made by mobile network operators which featured young women.

The findings from the Cameroon study appear to be dubious because the male researcher involved in the study uses language such as "young damsels" and "material girls" (ibid.), which might be broadly categorized as pejorative and serves as an indication of strong and negative gender bias on his part. Nevertheless, the report and its findings present an

example of how girls' mobile use is sometimes positioned as an overtly negative and/or socially undesirable act. This is because if their appropriation is thought to be in contravention of prevailing, socially acceptable norms on girls' behavior with mobile phones, then that might invite further parental control on girls' use of the devices, as has been seen elsewhere (GSMA Connected Women & Altai Consulting, 2015; Porter et al., 2015).

Nevertheless, girls continue to gain access to mobile phones, and choose to appropriate the devices after school in a variety of manners. Examples of secondary school girls' use of mobile phones after school have been documented in sub-Saharan Africa and South Asia to support informal learning (Caribou Digital, 2015), formal learning (del Carmen Valderrama Bahamondez & Schmidt, 2011), and non-formal learning (Barrie, 2015; So, 2012; Tyers, 2012) activities.

There have also been a few examples of girl-focused mobile for development interventions: To mark the International Day of the Girl Child in 2012, the World Association for Girl Guides and Girl Scouts (2012) enabled girls to submit blog and Facebook posts, as well as photos using the mobile internet, that shared their ideas for the type of world they aspired to live in. Elsewhere, U-Report, a "free SMS social monitoring tool for community participation, designed to address issues that people care about," (U-Report Uganda, 2016) enables girl volunteers to work with their peers after school to discuss pressing issues faced by girl children. Raftree (2013) cataloged 12 mobile-based initiatives that helped girls and young women in the Global South, including those enrolled in school, to develop skills, find jobs, and earn an income. In Kenya, the Map Kibera project worked specifically with young females, including schoolgirls, to map the places where they felt safe and received life-enhancing services, but also those places where gender-based violence was likely to occur (Awino & Map Kibera, 2011).

These initiatives highlight the diverse ways that girls in the Global South might use their mobile phones after school, and underscore that these uses are not always for educational purposes. We also saw through the literature discussed in this sub-section, and considering the literature unpacked in sub-section 2.2.2., that the simplistic representations of girlhood and the limited development outcomes adults voice on behalf of girls are problematic. The continued lack of people-centered development approaches which seek to work with girls as active development actors and subjects hampers the ability to build a holistic understanding of how girlhood in the Global South is evolving as mobile phones proliferate. This is one area in which I intend to contribute through this thesis.

## 2.5. Conclusion

In this chapter, I have linked three areas of literature that this action research investigation was concerned with. Of prime importance was the study of girlhood given that the main research participants are teenage girls who attend secondary school in Nairobi. Defining

girlhood was necessary because, historically, research has not focused much on this area of childhood, and even less so for girls who live in developing contexts. The decision to position girlhood prominently in this literature review was intended to help frame subsequent analyses linked to girlhood experiences of the after-school hours and mobile use.

Examinations of girlhood have often overemphasized formal education and the in-school hours while time after school has received sporadic and sometimes superficial treatment. After-school hours in the Global South are frequently found to be periods when work related to formal schooling is continued. Nevertheless, as was shown in this chapter, there exist myriad other after-school activities that girl children enrolled in school can participate in and realize desired development outcomes through. In an era marked by the diffusion of mobile technologies, we saw that some of the after-school activities that girls participate in are increasingly being enacted with and through mobile phones. Even still, when framed by numerous structural elements, particularly norms and discourses, the amount of time, and other resources (including mobile phones) available after school, girls can be affected in ways which make it difficult for them to engage in personal development for things they have a reason to value.

In this study, I will conduct research with girls enrolled in secondary school in Kenya to build a picture of their lives during after-school hours which considers more than growth-centric ideas of development. Through triangulation and analysis of real usage data from the two mobile technical tools introduced, I will explore how, if at all, and why the girls appropriate their mobile phones to increase their access to educational content after school, a development outcome they expressed a desire to achieve. As much as possible, the girls' perspectives will be foregrounded so that their representation is presented in a respectful manner which contributes to constructing multidimensional narratives of their lives. The aim is to delve into heretofore underexplored facets of girlhood and mobile practices in a time, place, and with people who are becoming increasingly connected through mobile phones.

With this in mind, in the next chapter I will frame this investigation conceptually, foregrounding the relevance of human development, time, and mobility given the findings of this literature review.

## Chapter 3: The Capability Approach, Time, and Mobility

### 3.1. Introduction

In this chapter, I will outline the understanding of development this study is based upon. The goal is to construct a conceptual framework that puts *people* at the heart of development process. I will begin by describing a predominant approach to international development, before providing an overview of the capability approach (CA) – a normative framework for international development which is increasing in its adoption and use. This will help explain the people-centered approach I will apply to an examination of time and mobility. Finally, I will conclude by explaining why I decided to utilize the Choice Framework (CF) to operationalize the CA in this investigation.

### 3.2. The Capability Approach

#### 3.2.1. Growth-Focused Development and an Overview of the CA

The CA is an international development philosophy born out of dissatisfaction with the development theorizations which preceded it. While these theorizations were all influential to some extent, due to space constraints I will only spotlight the growth-focused model.

In the 1980s, conservative political parties wielded considerable power in the world's major economies. With these parties came growth-based approaches to development, advocacy for 'globalization' and free market trade, and the ever-increasing flow of goods and ideas between countries that would – supposedly – spur the rapid generation of wealth (Harvey, 2005). The state's role was to foster conditions that would allow globalization to proliferate, mostly through the creation of competitive markets – and usually through the privatization of services that had previously been state-owned. When applied to international development, growth as the engine to advance nations manifested as Structural Adjustment Programs that "...centred on the need for a greatly reduced role for the state in the economy and much greater reliance on the market as a means of accelerating economic activity, particularly in the agricultural sector," (Berger & Beeson, 1998, p. 490). This shift in approach to development often came at the expense of the citizens who were the intended beneficiaries, particularly with respect to inequalities that emerged.

It is within this milieu that Amartya Sen came to develop a philosophy known as the capability approach (CA). In Sen's 1979 lecture, *Equality of What?* (1979), he first publicly articulated the capability concept. He repudiates growth-driven models, arguing that any assessment of human development must consider more elements than capital or economic growth. Sen continued developing the CA in lectures and writings during the 1980s and 1990s. Sen eventually published *Development as Freedom* in 1999, a guide to understanding his approach to international development.

As the title of his book suggests, Sen positions development as a process of expanding the real freedoms that people can enjoy (Sen, 1999, 2000a). To help people increase their opportunities for realizing freedom, Sen posits that efforts should be focused on removing barriers that prevent people from leading lives that they have a reason to value. While people might value development outcomes that relate to growth, economic or otherwise, Sen (ibid.) demonstrates that people do not only have growth-oriented aspects of their lives that they value. Accordingly, growth-based international development approaches are often unable to capture the full range of doings and beings that people may aspire to in their lifetime. The absence of freedom to pursue a valued life is termed an ‘unfreedom,’ or a lack of choice and opportunity. The process of eliminating unfreedoms, such as gender-based oppression and poverty, then describes how development occurs within the CA (Sen, 1999).

Sen (2003) argues that choice is an invaluable aspect of a life worth living: If we take a people-centered approach to development, then the expansion of freedoms becomes both the principle ‘end’ as well as a ‘means’ to development (Sen, 1999). Holistic consideration of human development – beyond traditional economic measures – is made possible through the perspective Sen advances. Fundamentally, he suggests that to know what people value, one should ask them. Then, their valued doings and beings should be the starting point for development action.

Several scholars have built upon Sen’s CA, Martha Nussbaum being most prominent among them. Nussbaum began working on the CA in the 1990s, most notably a book she edited with Sen, *The Quality of Life* (1993). Nussbaum’s (2011) CA conceptualization frequently focuses on quality of life and justice; each of these branches remain concerned with what people are able to do and be. Much of Nussbaum’s work has also delved into issues specific to women’s development and their capabilities (M. C. Nussbaum, 1999, 2000; M. C. Nussbaum & Glover, 1995). These writings seek understanding of the place of feminism in international development, and offer complex analyses of gender-based considerations that must be made when working with females in developing contexts.

Ingrid Robeyns is another CA theorist who has made contributions to the approach. Her detailed theoretical surveys enhance understanding of the philosophy, and offer responses to some of its critiques (Robeyns, 2000, 2003b, 2005). This includes Robeyns building on Nussbaum’s work to specify a list of capabilities since Sen has refused to create a list to avoid being overly prescriptive in terms of delineating what people value (Robeyns, 2003a). Like Nussbaum, Robeyns’s work often touches on gender issues (Robeyns, 2007). Most importantly for this action-based study, she also sometimes proposes the types of questions that can be explored empirically through the CA, and whether or not practical work with the CA actually makes a difference (Robeyns, 2006a).

Scholars like Alkire and Black (1997), Alkire (2008), Comim (2001), Frediani (2006), Fukuda-Parr (2003), Kleine (2013), and Unterhalter (2008) have worked in some capacity to operationalize key CA concepts and to contribute their perspectives on people-centered development. Their works have sought to bridge gaps between theory and practice by identifying ways to apply the CA to help realize outcomes that people have a reason to value. Yet, scholars such as Gasper (2002) and Iversen (2003) rightfully note that the CA has shortcomings in its application, including the purported emphasis on individual choice. They also highlight the complexity inherent in navigating and unfurling the myriad interdependencies that can arise from extant power differentials among household members – especially between males and females in the Global South. These challenges show that there remains much work to be done to develop the CA both theoretically and empirically. Nevertheless, adopting the CA in this study aligns with my desire to put people first, and to refrain from further promoting one-dimensional, growth-based development outcomes that may not be what people value.

Returning briefly to Chapter 2, we saw that girls in the Global South are rarely given the opportunity to express the doings and beings that they wish to realize. Furthermore, the representations of girls currently available create a picture of girlhood in which the valued doings and beings girls wish to pursue are narrowed: Growth-based development outcomes are pushed to the forefront (Klasen, 2002; Shabaya & Konadu-Agyemang, 2004). Applying the CA as the normative framework for development, this study can be conducted and interpreted in a way which represents the participants' lives holistically, using the diverse valued doings and beings voiced by the 22 secondary school girls in Nairobi as the starting point for action.

In the next sub-section, I will explain three key CA terms that will be helpful to explain for this thesis.

### 3.2.2. The CA – Key Terms

**Functionings** are the states of being or activities that a person may want for her life (Sen, 1999). Building on Sen's definition, Alkire (2005) explains functionings as "...the valuable activities and states that make up people's well-being – such as a healthy body, being safe, being calm, having a warm friendship, an educated mind, a good job," (p. 1). In Kleine's book *Technologies of Choice?* (2013), she synonymizes Sen's 'functionings' with 'development outcomes', noting, in line with Sen (1999), that freedom expansion/choice is the primary end (and means) of development. She also states that "...the primary development outcome is choice itself. Secondary development outcomes depend on the individual's choice as to what life they value," (p. 45). Through this link, Kleine makes CA language more compatible with the language of development practice. In this thesis, achieved functionings will be defined as the valued *development outcomes* that one achieves. The primary development outcome is always



choice, for without the ability to choose from a full opportunity set, people exhibit a lack of freedom (Gore, 1997; Sen, 1999). Contextualized for this study, a secondary development outcome could be an enhancement in the ability to access educational content after school.

**Capabilities** are defined as “...the substantive freedoms he or she enjoys to lead the kind of life he or she has reason to value,” (Sen, 1999, p. 87). Capabilities are elsewhere defined as “...a set of vectors of functionings, reflecting the person’s freedom to [...] choose from possible livings,” (Alkire, 2005, p. 2). Capabilities reflect the opportunity set of possible doings and beings a person derives from the combination of her resource-based agency and the structure(s) within which she must exercise this agency (Kleine, 2011a). The close link between structure and agency is a key characteristic of Kleine’s work. When a person experiences capability (or freedom) expansion, she can increase the amount of choice she has to live a life she has a reason to value (Deneulin & Shahani, 2009). Within CA logic, emphasis is placed on expanding people’s *capabilities*, rather than achieving a particular set of outcomes. By focusing on the ‘opportunity set,’ or choices that people have (Bossert, 1996; Gore, 1997), Sen (1999) clarifies the difference between doing something because you make the choice to do it – or exercising agency – and doing something because no other choice is available. Borrowing from Kleine’s (2013) elaboration of the term, in this thesis when ‘capabilities’ are mentioned, I am referring to the fact that capabilities emerge from the combination of the resource-based agency a person is able to exhibit given the structures she must navigate.

Kabeer (1999) states that **adaptive preferences** emerge when there is a person who appears to be “qualifying choice: ‘choosing not to choose,’” (p. 440). She further suggests: “How people perceive their needs and interests is shaped by their individual histories and everyday realities, by the material and social contexts of their experiences and by the vantage point for reflexivity which this provides,” (Kabeer, 1999, p. 441). From a capabilities perspective, adaptive preferences are also viewed as being “...formed without one’s control or awareness, by a causal mechanism that isn’t of one’s own choosing,” (M. C. Nussbaum, 2000, p. 137). Sen (1999) posits that utilitarian views on adaptive preferences are insufficient because they: “...can be easily swayed by mental conditioning and adaptive attitudes,” (p. 62). Sen (ibid.) asserts that people who are perpetually impoverished or otherwise deprived (one example he used is a housewife living in a sexist culture) might adjust their life's ambitions as a mechanism to cope and to work towards something they view as more achievable given their circumstances.

Teschl and Comim (2005) challenge conceptualizations of adaptive preferences that narrowly explore adaptation as a negative phenomenon. They argue that capabilities-based evaluations of adaptive preferences should do more to understand how adaptation impacts both a person's well-being *and* the real opportunities available to realize the doings and beings

constitutive of a life she has a reason to value. This is because a subjective account of one's well-being provides only part of the information needed to evaluate how and why, if at all, adaptation is occurring among an observed research population.

In this study, adaptive preferences in the girls' expressed primary development outcome, having choice to increase access to educational content after school, was something I initially thought surfaced in response to structural and agency-linked conditions found in the research context (see Chapters 4 and 6). However, as will be seen in Chapters 7 and 8, the choice they desired was linked to valued doings and beings that could be considered expected of them by adult stakeholders in their lives – but some others also emerged that were unexpected and likely an indication of their desired development outcomes independent of adult influence. Because Kleine (2013) does not map adaptive preferences directly into the CF, I will continue to use this term throughout the thesis. In the next sub-sections, I will explore the relationship between the CA and children, education, and ICT4D.

### 3.2.3. Children and the CA

In the preceding sub-sections, I established the theoretical framing of this thesis by unpacking CA logic and reviewing three of its most important concepts to illustrate what conceptually guides this research. In this section, I begin with exploration of the CA and children because the subjects and research participants of this study – secondary school girls – are the people at the heart of the action research. According to UNICEF and its Convention on the Rights of the Child (1992), a child is any person who is under the age of 18; the Children Act, 2001 of Kenya states that “ ‘child’ means any human being under the age of eighteen years,” (Kenya Law, 2012). Of the 22 research participants, only one was 18 years old at the time this study commenced, so most girls were legally classified as children.

CA scholars have reflected on issues of concern to children's development, but have rarely assumed child-centered perspectives in their work (Biggeri, Ballet, & Comim, 2011). It has also been challenging for CA theorists to reconcile the goal of freedom expansion with the fact that, when it comes to children, freedoms are frequently limited because they are sometimes erroneously viewed as adults-in-training who do not have the knowhow to make their own choices (Bessant, 2014). This contradiction has resulted in a call to understand how aging as a physiological development process influences the real freedoms a child can enjoy (Ballet, Biggeri, & Comim, 2011).

An argument has been advanced within CA literature to view children as active subjects who may need support from a more experienced individual to make informed choices as they age, but that children can learn to evaluate these choices on their own and potentially avoid making some choices over others in the future (Saito, 2003). This is not to say that children cannot make their own decisions, but that decisions children make are usually

informed by more information and experience as they grow older. Relatedly, if a parent or guardian's capabilities are constrained, whether from a lack of resources or because the structure they navigate is disempowering in some way, it is likely that these constraints can also negatively impact their children (Biggeri, 2007). For these reasons, capabilities-based analyses of interventions with children should consider influential factors that impact development outcomes and may have links to caregivers in the children's lives. However, adult-linked factors need not be placed at the forefront of analysis when children are the subjects of a study.

Previous child-focused CA studies have employed different methods to understand the lives that children value: Drawing on cultural studies and visual anthropology, a 12-year study conducted with children in Spain asked children to explain their perceptions of the world in which they live, and to express their desires for the world in which they would like to live (Jover & Thoilliez, 2010). Biggeri and Anich (2009) worked with street children in Uganda, and utilized a questionnaire and participatory methods including drawings, maps, photo essays, and autobiographies to understand their realities. This information was also used to discern the children's living conditions, and to identify and discuss the issues that were most important to them.

In another CA study with Ugandan street children, Cahalane-Hughes's (2013) qualitative research design combined informal discussions, participant observation, semi-structured interviews, and FGDs to help children voice how, if at all, they expected NGOs to support them in realizing the lives they have a reason to value. In 2004, a world congress led by children with support from adults focused on child labor, and urged children to share thoughts on issues that affect their lives most, and to expound on their experiences and hopes (Biggeri, Libanora, Mariani, & Menchini, 2006a). This data gathered from former child laborers was complemented by FGDs, a survey, and case studies.

Important to note about these CA studies with children is that they often adopt multiple methods with a qualitative dominant research design, in line with methodologies employed in childhood studies (Andresen, Diehm, Sander, & Ziegler, 2010). A blend of methods and media can empower children to position themselves as social actors who we conduct research *with*, rather than *on* (J. Barker & Weller, 2003). This dovetails with the people-centered philosophy the CA espouses. In the next sub-section, I will discuss the CA and education since this study was conducted with children enrolled in school.

#### 3.2.4. Education and the CA

To understand the applicability of the CA in this study, we need to identify the theoretical links to education. The CA has been enthusiastically taken up in education as an area of study. In the CA, education is positioned as a key human development component – and one of the

most valuable capabilities – since it can help people acquire other capabilities (Unterhalter, 2009). Sen (2011) contends that education helps equip youth with the means to achieve the lives that they have reason to value. A briefing note on the Human Development and Capability Association (HDCA) website (Unknown, 2007) advocates a capabilities-based approach to education, because through education a person can come to understand “...valued beings and doings [... and] can explore her own conception of what it is she has reason to value,” (p. 3).

Education in the CA has been described as both instrumentally and intrinsically significant (Robeyns, 2006b). Throughout *Development as Freedom*, Sen (1999) stresses the benefits of educational participation, arguing that it can help people attain a better quality of life. Sen (2000b) also mentions the importance of expanding access to educational opportunities as an element contributing to the surprisingly good performance of some low-income countries during the 1990-2000 decade. Tikly and Barrett (2011) highlight that education in a capabilities-based perspective can contribute to facilitating learners’ empowerment by promoting the development of basic freedoms because:

Through emphasising a range of important potential outcomes from a quality education and the importance of context in understanding what these might be, a social justice perspective can help to refocus attention on the nature of a good quality education and of the importance of public debate at all levels in defining a good quality education and how it can be evaluated. (p. 4)

However, Unterhalter (2003b) warns against the assumption that formal education in schools is always beneficial, particularly for girls. Rather, she argues that some aspects of education, such as messaging embedded in textbooks and curricula, can be especially damaging to learners. For example, textbooks might teach girls not to pursue careers in the science, technology, engineering, and mathematics (STEM) professions, since women are rarely depicted in these roles in textbooks. Because of this, even when education is meant to enhance a capability, it can sometimes contribute to unintended development outcomes, such as girls’ lack of enrollment in STEM subjects in school.

Vaughan and Walker (2012) examined education in South Africa from a capabilities perspective, problematizing the links between education, capabilities expansion, and the doings and beings that people come to value. The authors argue that because education directly influences what people value, education informs the capability sets that people prioritize and develop. This influence shapes the choices people have to achieve their desired development outcomes: Education that does not encourage learners to act and think ways that develop a sense of opportunity in choice, for example an excessively teacher-focused or authoritarian model, is therefore problematic to a certain extent – and may not necessarily have the learners’ future freedoms in mind (ibid.).

As Unterhalter (2003) and Vaughan and Walker (2012) highlight above, applying the CA to an educational setting can surface contradictions that illustrate how education shapes a child's ability to lead a life she has reason to value, but that this influence is not always positive. Hart (2012) also states that the CA: "...recognizes that not all individuals will participate or benefit from education in the same way, nor be able to convert the resources afforded by education to generate the same or similar advantages in life," (p. 276). The point Hart makes is particularly relevant since the 22 research participants in this study have a different set of capabilities, and so their desired development outcomes are not the same, and neither may they be realized evenly. This raises questions regarding the study design and accompanying ethical considerations, which must ensure that the educational intervention adheres as closely as possible to a 'do no harm' principle. I will explore these questions and considerations further in Chapter 5, where I will lay out the methodology.

According to Unterhalter (2009), the application of the CA to education is thought to occur in three ways:

1. To discuss education, its value, and its evaluation (see for examples Hatakka, Andersson, & Grönlund, 2013; Hatakka & Lagsten, 2012; Tao, 2013; M. Walker, 2008; and Warrington & Kiragu, 2012);
2. To explore how education links to other capabilities (see for examples Johnson & Sherraden, 2007; Nussbaum, 2006; Terzi, 2005; Unterhalter, 2003, 2012; Walker, 2012; Young, 2009); and
3. To track and measure people's views on education and its value (see for examples Andresen, Otto, & Ziegler, 2006; Flores-Crespo, 2007; Stephenson & Yorke, 2012; and Terzi, 2008).

In this study, I will consider the second application above, primarily using a CA-based framework called the CF to structure the data analysis and to evaluate this education action research project with girls who use mobile phones after school. The CF will be explored further in section 3.5 of this chapter.

The CA view of education is multi-dimensional and can potentially effect profound change in the lives of people who have access to education. Even still, education can be used unintentionally to stimulate outcomes that people may not value, or even reproduce the inequalities they wish to eliminate (Tikly & Barrett, 2011). The same words of caution can be applied to ICT4D, the next area relevant to the construction of this conceptual framework.

### 3.2.5. ICT4D and the CA

In defining the field of ICT4D, I will break the concept down into its constituent parts: 'ICTs' and 'for development'.

UNDESA-GAID (2009) defines ICTs as “...tools that facilitate communication and the processing and transmission of information and the sharing of knowledge by electronic means. This encompasses the full range of electronic digital and analog ICTs...,” (p. 5). The World Bank (2002) defines ICTs as “...hardware, software, networks, and media for collection, storage, processing, transmission, and presentation of information (voice, data, text, images),” (p. 3). Masika (2012) explains ICTs as: “technologies that provide information through telecommunication. ICT is an umbrella term for communication devices, applications and apparatus that include radio, television, mobile phones, computers and satellite systems,” (p. 16). In a report for the UN Research Institute for Social Development (UNRISD), Hamelink (1997) states that: “[ICTs] encompass all those technologies that enable the handling of information and facilitate different forms of communication among human actors, between human beings and electronic systems, and among electronic systems,” (p. 3).

Of these four definitions, Hamelink’s (1997) is the only one to incorporate the human dimension, and has been used by ICT4D researchers working from a capabilities perspective (Gigler, 2015)<sup>6</sup>. The human element is crucial, given that technology use does not occur in a vacuum, and is socially constructed and transformed in and by diverse societies (Otte, 2014). Therefore, in this thesis the working definition of ICTs will be *digital and analog hardware, software, networks, and media which facilitate knowledge sharing and construction, as well as contact between and by people and organizations, often through systematized processes shaped by the social contexts of use.*

Turning to the concept of ICTs ‘for development,’ there is less consensus as to what this means – particularly among multilateral organizations that have historically embraced modernist/techno-centric development ideologies. The World Bank often, although not exclusively, discusses ‘for development’ in growth-focused development terms:

Indeed information and communication technologies:

- are a key input for economic development and growth;
- offer opportunities for global integration while retaining the identity of traditional societies;
- can increase the economic and social well-being of poor people, and empower individuals and communities; and
- enhance the effectiveness, efficiency, and transparency of the public sector (including the delivery of social services). (World Bank, 2002, p. vii)

Similarly, the World Economic Forum (WEF) (2015) views ‘for development’ as the ways in which ICTs can be used to derive economic value and to promote a strong business

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<sup>6</sup> Masika’s (2012) doctoral thesis also adopts a CA perspective, but does not mention people in her definition of ICTs.

environment. The WEF (2015) report considers people and the potential development impact of ICTs in their lives, but this perspective is presented in terms that overemphasize the role of technology, particularly its design and availability.

Within the CA, 'for development' has been interrogated by academics and practitioners who argue that use of ICTs to realize human – and not just economic – development has been relatively underexplored (Zheng & Stahl, 2011). Others propose that ICT 'for development' should always start with the development outcomes desired by the intended beneficiaries (Alampay, 2006b; Unwin, 2009; Zheng, 2009). As one of the most vocal critics of techno-centric international development approaches, Unwin (2009) acknowledges that ICTs can contribute to economic development, but prioritizes how these technologies might help people meet their needs:

...[ICT4D] is also concerned with issues to do with the access that people have to information, about the ways in which those from different backgrounds communicate with each other, and about the content requirements that poor people need if they are to be able to transform their lives and livelihoods. (p. 1)

Gigler (2015) takes a similar stance: He positions 'for development' as a people-centered imperative upon which economic, political, and social change can be built. Sen (2010) argues that mobile technology has the potential to enhance freedom, facilitate communication, fight oppression, and promote liberty. Zheng (2009) and Kleine (2010) have both called for using the CA in a comprehensive manner to define the "D" in ICT4D, because without knowing the type of development that people seek, the use of ICTs may or may not contribute to realizing the desired outcomes. In this thesis, I will evaluate the contribution of ICTs – specifically two mobile apps – to expanding the choices available to the participants to increase their access to educational content after school. This is because the 22 girls expressed this as a desired development outcome.

In the past five sub-sections, I established the conceptual framing of this thesis by unpacking the CA logic for international development, reviewing key terms, and drawing links between the CA, children, education, and ICT4D. We saw that the CA as an international development framework is intended to be applied in a holistic manner which puts people first. However, when children are the focus of a CA-based intervention, there is potential for influence from adult stakeholders, whether intentionally or not, that can shape the development outcomes realized by people under the age of 18. While I underscored earlier that this does not mean that children cannot make decisions independently, it does raise awareness that because of the amount of time they have lived, children often still need support to pursue lives they have a reason to value. If not acknowledged and critically reflected upon, this influence could skew understanding of what children value and how their individual capabilities impact the real freedoms they can enjoy both now and in the future. In a

way, this can threaten the integrity of child-centered research, since discussions must be had about how and to what extent, if at all, a child's actions are informed by their own agency and choices, as opposed to acting because of a parent or guardian's wishes. From examining links between the CA, children, education, and ICT4D, we see that the complexity of children's lives and their ability to pursue freedoms they have a reason to value stem from myriad factors beyond their control. Thus, placing children as the focal point of CA-based development interventions necessitates a holistic methodology and evaluation process.

In the preceding discussions, references to time and mobility were made. Time was represented as age and as progression through school, and was linked to children and education. Mobility was represented as the virtual movement of knowledge and information, and metaphorical movement as social advancements which can signify human development, including with and through ICTs. Yet, time and mobility have their own links to the CA, and are constituted of elements that are important to this education action research intervention. Accordingly, the next sections will explore theorizations of time and mobility, primarily their construction in international development discourse, and highlight synergies between these two concepts and the CA.

### 3.3. Time

When time is considered in the CA, connections made to people's lives move beyond economic impact. Nuances in how people tell and perceive time are uncovered in holistic analyses when the CA is used as an analytical tool, and the significance of time is often variable. Time recurred throughout the research process as a theme that affected not only the girls' education, but also their mobile use and lives after school. I will now consider some ways in which CA theorists have engaged with time in international development. Then, I will survey how time is influenced by the people who perceive it, with specific attention to the influence of people's ICT appropriation.

#### 3.3.1. Time and the CA

Comim (2003) posits that time is an integral part of the process people undertake to acquire capabilities – which is itself a process reflective of the time and control that people have to pursue the doings and beings that they value. Writing on the CA and gender inequality, Robeyns (2003a) proposes the notion of time-autonomy as “...being able to exercise autonomy in allocating one's time,” (p. 72). She also acknowledges that gender-based time inequalities impact the time one has for rest and leisure and the stress-related consequences experienced when people confront a lack of time.

In earlier versions of the CF (Kleine, 2010) – a CA conceptualization to be unpacked in section 3.5 – time was not included as a resource in an individual's resource-based agency



portfolio. However, time was subsequently added (Kleine, 2011a), with Kleine later (2013) stating that: “What is crucial here is not the absolute time an individual has but rather the combination of time and the degree of control they have over it. [...] Self-controlled time, or the use of time that has either been sanctioned by or shielded from such dominant forces, is a *vital resource that forms the base for using other resources and realizing individual agency* [emphasis added],” (pp. 47-48). By “dominant forces”, Kleine (2013) refers to structural elements such as gendered household dynamics, which may result in some household members having more of a say in how their time is allocated when compared to others.

Walker, Berekashvili, and Lomidze (2014) explore an understanding of time poverty, in which they state that a lack of time for rest and leisure does not always mean that a person is poor in purely economic terms. For example, a busy media executive in Nairobi may only sleep four hours each night, but this is because she spends most of her time in the office and commuting. The key point to remember here is that the executive makes the choice to spend her available time working, even though by all accounts she might still be able to live comfortably having more of a balance between work, rest, and leisure.

By comparison and with relevance to my study, a secondary school girl in Nairobi may not have the same time choices as a media executive. But even if this schoolgirl had more time, it is not guaranteed that she could spend this time in pursuit of the doings and beings to which she aspires. Her choices might be influenced by parents or older siblings who expect her to spend time performing chores and care work in the home, or paid employment outside of the home. She might also experience time poverty arising from long school commutes if speedy forms of transportation are not available or not affordable. The complexity inherent in understanding time and its impact on people points to the fact that superficial analyses of time can mask both structural and resource-based constraints that prevent people from leading lives they have a reason to value. As such, time-based examinations in this study will be done in a holistic manner using the CA, and the CF specifically, to critically engage with the temporal complexity of the 22 girls’ lives who participated in this education action research intervention.

### 3.3.2. The Social Construction of Time and the Digital Influence

Whenever time is examined – especially when comparisons are made across different societies – historical and social influences that shape time are often mentioned. Griffin (1992) posits that time is created and defined through ongoing social processes rooted in the past. Another author notes that socio-political processes need an extended period of time (a longer duration) before a meaningful conclusion can be derived from the occurrences (Rast, 2012). Scrutinizing a situation as a snapshot of short duration can yield inaccurate analyses of a context, when compared to exercises where longer examinations are employed (Grzymala-Busse, 2011; Rast, 2012). Through a literature review of 885 studies on time and community,

Bastian (2014) found that time construction is linked to social processes drawn from the community in which one lives: She suggests that an individual's ability to independently control her time can be influenced in part by expectations that members of a group have about how time is used by other group members. Time in this sense is then a source of inclusion for some and possibly a means for freedom expansion, and a source of exclusion and freedom constraints for others, depending on the person, their community, and the expectations held. The social construction of time within the NDSS community, and the structural elements and resource-based agency which framed the girls' time use during this 13-month study, will be highlighted in Chapters 6 through 8 through the data analysis.

As industrialization has spread, time has been increasingly structured and standardized as a way to measure the labor output of workforces (Torns, 2001, 2004). Duncheon and Tierney (2013) state that there are two predominant time theories, "clock time" and "*socially constructed time* [original emphasis]," (p. 237). Clock time is the universal time measured by clocks and calendars in a linear fashion, and is largely objective and scientific in nature; socially constructed time is personally measured and is largely subjective, socially influenced, and perceived differently by different people in different circumstances (ibid.). One manifestation of socially constructed time is 'dead time.' Cresswell (2012) imagines dead time as a person's perceived stillness summoned by a lack of 'productive' activity that occurs, for instance, during commutes. Elsewhere and with ICT use, dead time has been defined as the time when people who own mobile phones cannot contact others and others cannot contact them (Bittman, Brown, & Wajcman, 2009). Usage of the term 'dead' to refer to time generally has a negative connotation, but it may not always be the case that someone who experiences dead time is bored, displeased, or unhappy. In fact, Kneale (1997) argues that dead time does not exist and that having time of stillness or to just 'be' can produce positive outcomes, such as opportunities to think.

Increasing ICT uptake is disrupting traditional time constructions, and contributing to the transformation of 'unproductive' time into seemingly more productive 'in-between' time while on-the-go. Hope (2009) suggests that the relatively slower pace that characterizes the industrialized time instituted by nation-states – including the time it takes to physically travel from one location to another – is being challenged by real-time transactions conducted through digital media. Urry (2006) highlights how on-the-spot communications through mobile technology are filling schedules or layering activities on other activities (especially while a person is mobile), which had previously been impossible: "Much mobile use occurs in-between events [...] (especially with SMS texting). [...] Much mobile phone use involves arranging and rearranging 'events' on the move, in transit," (p. 369). In this way, in-between time represents

a challenge to the prevailing time flow that Hope (2009) notes is comparatively slower and fixed in arrangement.

Duncheon and Tierney (2013) also propose a third conceptualization of time called 'virtual time'. Virtual time is time shaped by ICT use and is often characterized by the increased speed with which people can complete activities that have time limits associated with their completion. Virtual time transforms the rhythm, duration, and pace of time observed in the digital age, surfacing tensions with long-established temporal structuring in societies. For example, before the advent of ICTs such as the telephone, interpersonal communications were not usually instantaneous, and a rapid way for people to connect directly with one another simply did not exist if they did not live in close proximity. Conversations and interactions were often planned and intentional to ensure people crossed paths physically. Alternatively, postal mail served as a proxy for in-person connections. However, both methods were time-consuming to plan and implement, even if this time spent was not always viewed negatively.

Physical connections can now be facilitated more quickly through use of ICTs like mobile phones, so that people do not always have to plan when to connect with someone, since they can use ICTs to contact them spontaneously. This has undoubtedly had benefits like efficiencies in sending and receiving messages between people located a distance from each other, along with the possibility of connecting with more people more often. Yet, this digital development is not without its drawbacks. ICTs have become a source of intergenerational tension between the young and the old, because some adults increasingly view youth technology as 'time wasting,' and not productive (Richtel, 2012), or to be distracted by ICTs and not sufficiently 'present'. Even in Kenya where this study was conducted, youth ICT – particularly mobile phones – has been viewed askance by adults. This is because some adults think that technologies have contributed to the deterioration of long-held customs, such as elders passing down vetted wisdom to younger generations (Limo, 2010). This custom, it is believed, is being replaced by youth who seek out information online from what are perceived by the adults as questionable sources.

In their literature review on youth educational technology usage, Kassam, Iding, and Hogenbirk (2013) highlight that disparities among learners in both Global North and South contexts is based on how poorer students spend their time using technology less creatively, while their peers who are financially better off use technology to create and share knowledge. The authors then go on to explore what might be needed to help poorer youth spend their time using technology in a "...more constructivist and agentive manner for learning," (Kassam et al., 2013, p. 217). The authors suggested enlisting digital literacy trainers who might come to the homes of the poor to help improve their ICT appropriation for knowledge development. However, they admit that training would not eliminate time and financial barriers that also

prevent the poor from engaging in varied uses of information and communication technologies. Separate from these issues, I also challenge the idea that poor people must always use their time online in a manner that others might deem to be productive, since leisure is also a part of the life they have reason to value, as seen in Chapter 2.

Narrowly-focused technology use is not agency-enhancing for the poor; instead it limits their choices and sculpts their desired outcomes so that they participate in the development process in a way that is not freedom-enhancing. Furthermore, time to engage in entertainment is often devalued in discourse, particularly when juxtaposed with education. These discourses contribute to unfair expectations that people who are poor should fill their free time with activities that promote growth-focused outcomes that international development actors view favorably. This echoes the pattern I uncovered in the preceding chapter with how the confluence of girlhood, after-school hours, and mobile phone use in the Global South is perceived by adults in local contexts and the international development complex.

As seen in this sub-section, time in its different forms and socially constructed parts is increasingly defined and experienced in a manner which illustrates that it has become faster paced, and more broad-reaching and influential, particularly in the digital age, as people increasingly access and use ICTs. In the next section, I will explain how mobility has undergone a similar transformation as people have adopted technology.

### 3.4. Mobility

In this section, I will explore different conceptualizations of mobility before highlighting associations between time and mobility. I will conclude this section by positioning mobility in the CA literature.

#### 3.4.1. Exploring Mobilities

Mobility has been theorized as "...a highly differentiated activity where many different people move in many different ways," (Adey, 2006, p. 83). It has been viewed as "...a fragile entanglement of physical movement, representations, and practices. Furthermore, these entanglements have broadly traceable histories and geographies," (Tim Cresswell, 2010b, p. 18). Hannam, Sheller, and Urry (2006) contend mobility occurs at diverse scales:

The concept of mobilities encompasses both the large-scale movements of people, objects, capital and information across the world, as well as the more local processes of daily transportation, movement through public space and the travel of material things within everyday life. (p. 1)

Although Cresswell (2010a) spotlights physical movement, this is not the only type of mobility possible. Not only has mobility been documented as a physical phenomenon (Gatersleben & Uzzell, 2007), but also as socio-educational (Tran, 2015) and virtual (Aguilera, Guillot, & Rallet,

2012) flows. Nor is mobility only concerned with movement: Immobility, mentioned earlier in sub-section 3.2.5., is when mobility “...is considered in relation to forms of place, stopping, stillness [...] that are enabled by or enable mobilities,” (Tim Cresswell, 2010a, p. 3). Furthermore, immobility is not always a permanent state: “Apparently-still phenomena are always already in a state of ontogenic transformation [...]. Still here is a momentary illusion [...] and, most importantly, a relational effect of distributions of power,” (Bissell & Fuller, 2011, p. 4).

Connecting mobility and geographic research on children and youth, Barker, Kraftl, Horton & Tucker (2009) note that young people’s movements are framed by the social contexts they live in. This framing is comprised of structural and resource-based elements such as power, the transport types available, place, the type of travel undertaken, socioeconomic status, and gender. An influential aspect of children’s mobility is age. Dodgshon (2008) posits that the progression of biological time characterizes the human experience: As people traverse different life stages as they age, their mobility is continuously (re)constituted by spatio-temporal factors linked to the context in which this movement occurs (ibid.). Age-related factors delineate multiple aspects of when, where, and how youth move, and indeed whether they move at all (Mikkelsen & Christensen, 2009). In this thesis, (im)mobility will be defined as socially constructed movement and/or fixity, often in relation to someone or something else. In **Table 3-1**, I also define two types of mobility that will be the focus of this research, physical and virtual, based on understandings from Benwell (2009) and Line, Jain, and Lyons (2011). I will also contextualize these definitions with people as the subjects of action based on definitions:

**Table 3-1**

Mobility Type	Definition	Example
Physical	Movement of people and their bodies from one position and/or place to another, independently or with the assistance of an object or vehicle (Benwell, 2009).	<b>Physical mobility</b> can be small scale, such as walking to school or riding a bicycle. This movement can also be large-scale, like traveling by plane from London to Nairobi.
Virtual	Movement that people realize with and through ICTs. With this mobility type, the human body that realizes the movement does not usually physically travel to the place it connects with virtually. However, the human body itself may still be in motion (Line, Jain, & Lyons, 2011).	<b>Virtual mobility</b> can include teleworking from home or remotely accessing a library book using a mobile phone.

*Physical and virtual mobility: Definitions and examples (Author)*

### 3.4.2. Mobility and the CA

Perhaps the strongest case for joining theories of mobility and the CA was David Kronlid's (2008) book chapter *Mobility as Capability*. Reflecting on Sen's (1999) refusal to articulate a list of capabilities, Kronlid (2008) draws on the work of Alkire and Black (1997) and Robeyns (2003a) to qualify mobility as a capability primarily through the identification of its value to people who have reasons to aspire to be mobile. Robeyns (2003a) uses a list and goes as far as to rank mobility as the 10<sup>th</sup> most important capability in her listing. Separately, Nussbaum (2000) also includes mobility in her list, as a form of bodily integrity, claiming that "being able to move freely from place to place," (p. 78) is one of the "central human functional capabilities," (p. 78).

All of the aforementioned authors ponder mobility from the perspective of women and girls, focusing on mobility as a gendered experience which is socially constructed and differentiated based on the sex of the person doing the traveling (Uteng & Cresswell, 2008). Often gendered mobility is shaped by time, including how often and how long women and girls are permitted to travel and the journey lengths afforded by the most affordable forms of transport available to them (e.g. walking vs. riding the bus) (Tanzarn, 2008). Uteng (2006) explains that "mobilities result from specific geographies, networks and socio-economic-political-infrastructure contexts," (p. 458), and that the capabilities most easily observed are those which people have chosen to realize. However, the author cautions that structural and

resource-based constraints can negatively impact the number and type of mobilities that people have the choice to realize (ibid.).

Kronlid (2008) commingles social justice, mobility, and gender, stating: “Being socially and spatially mobile is generally seen as one central aspect of women's well-being,” (2008, p. 15). The author uses the CA to infuse an ethical dimension to mobility, one which considers social exclusion, autonomy, and marginalization. These points are linked to norms that societies apply to people based on their gender and the spaces that people can access. Cresswell (2006) expands on the ethical dimension of marginalization and mobility arguing that “...uneven geographies of oppression are also evident in people’s differential abilities to move,” (p. 742).

Mobilities research in the Global South has found that girls often have their movements restricted by elders in their lives, effectively limiting their access to and participation in myriad spaces that might support their human development (Porter, 2011; Porter, Hampshire, Abane, Munthali, Robson, Mashiri, & Tanle, 2010; Punch, 2000). In Chapter 2, I discussed different aspects of how girls in the Global South can be marginalized; the lack of autonomous everyday mobility they can experience further affects how they construct girlhood. This is because parent and guardian perceptions associated with girls’ physical and virtual mobility can (de)limit these forms of movement (Livingstone & Bulger, 2014; Murray, 2009; Porter, Hampshire, Munthali, & Robson, 2011).

Because this thesis will consider an education action research intervention that makes use of mobile phones during after-school hours, mobility (especially virtual) will be considered in the analysis chapters. I will also demonstrate how the mobile tools introduced are appropriated to facilitate movement, particularly when mobility is sometimes prevented by factors beyond the girls’ control.

As we have seen in sections 3.3 and 3.4, time and mobility have ties to and are intertwined in different ways with (girl) children’s lives, education, and ICT4D. Underpinning these themes with the CA enabled me to undertake an integrated inquiry, which surfaced tensions that demonstrate how evaluating an individual’s circumstances is crucial to understanding the outcomes that emerge from people-centered interventions. To aid my ability to systematically interpret data generated during this study, in the next section I will introduce the Choice Framework and explain how it is used as an analytical and evaluative tool for capabilities-based studies.

### 3.5. The Choice Framework

With the theoretical foundation for this study articulated – by interweaving the CA and its links to children, education, and ICT4D with theories on time and mobility – I will now discuss how I chose to operationalize the CA throughout the action research process. Part of the difficulty

with operationalizing the CA is its theoretical breadth and its deliberate under-specification in an attempt to avoid being prescriptive (Comim, 2001). However, many have attempted to do so, some with frameworks and others by grounding their work in the approach.

Working with the poor in Egypt, Ibrahim (2011) developed a conceptual framework which joined aspirations, well-being, and poverty to help researchers understand how to identify the sources for failure or success that poor people encounter. During the study, Ibrahim examined the socio-cultural factors that affect a person's agency when they try to exercise freedom to live a life they have a reason to value. Additionally, she introduced a methodology for identifying the capabilities that poor people aspire to through use of a well-being questionnaire with 92 open-ended questions. While this approach is undoubtedly people-centered, reasoned, and thorough, the number of questions asked might be time-consuming for poor people, who may already have great demands on their time.

In a five-year action research project with South African women who wished to improve their economic circumstances, Conradie (2013) started her conceptual analysis with aspirations and drew on the CA's theoretical and methodological tools to make sense of the development outcomes observed. Conradie engaged in deliberate aspirations work with an initial group of 104 women. The work consisted of having the women voice and document their aspirations. The women then worked individually and as a collective to intentionally realize these aspirations through activities such as participating in life-skills training and small group work. While this was an impressively deep engagement in terms of the time taken, one challenge encountered by the researcher was that the study length meant that only 29% of the original participants remained by its conclusion, limiting the ability to track changes for all the women longitudinally.

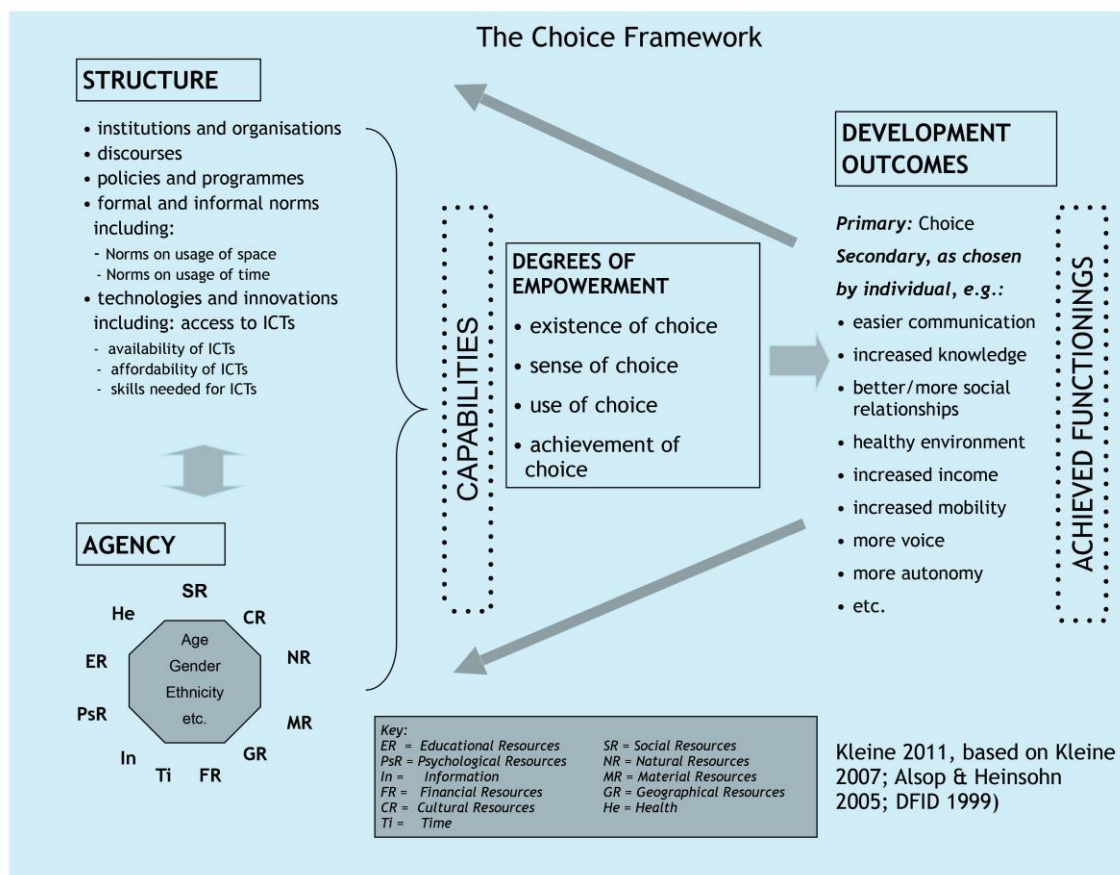
Similar to what this thesis explores, Warrington and Kiragu (2012) sought to understand how 24 girls enrolled at the primary level in a rural area of Kenya (Kajiado District) were driven to persist with their studies, despite numerous structural and resource-based barriers (e.g. gendered norms which limited their agency, a lack of financial resources, etc.). Through application of the CA, the authors utilized in-depth interviews to pinpoint and critically interrogate the sources of unfreedoms that impacted the girls' educational participation, especially those which arose from their gender. They were also able to investigate why education was a valued functioning among the girls, and how they realized the capabilities needed to pursue education participation. The study findings suggested that the research participants' passion to obtain an education, and support from important people in their lives – like their parents, older relatives, and siblings – served as a basis for their educational achievements.



Like the limitations of qualitative research more broadly, the above described methodologies to operationalize the CA could be critiqued for their relatively simple approaches to making sense of something as complex as the human experience (Frediani, Boni, & Gasper, 2014). Even still, when attempts are made to operationalize the CA, Sen encourages this work to be made practical whenever possible, as evidenced when he discusses how to evaluate standards of living: "...The approach must nevertheless be practical in the sense of being usable for actual assessment of living standard. This imposes restrictions on the kinds of information that can be required and techniques of evaluation that may be used, (Sen, 1987, p. 27). With the above in mind, I will now explore why I decided to use the Choice Framework to operationalize the CA in this study.

Kleine's (2012) operationalization of the capability approach, the CF, is based on the idea that to realize the development outcomes that people value, "...individuals [... use] their agency to navigate social structures, which have in turn been co-created by individuals," (p. 46). Her framework (see **Figure 3.1**) is read from right to left, and I will briefly explain the constituent parts of the CF in that order.

**Figure 3.1**



*The Choice Framework (Kleine 2013, based on Alsop & Heinsohn 2005; DFID 1999; p.122)*

As with Sen's (1999) philosophy, the CF starts with achieved functionings as the principle 'end' and 'means' to development; the primary development outcome is always choice, and the

secondary outcomes are the 'doings' and 'beings' that people value. The degrees of empowerment, based on conceptual work previously carried out by Alsop and Heinsohn (2005), were added to Kleine's visualization of the CA because "...the degree to which a person is empowered depends on their individual agency and the existing opportunity structure," (Kleine, 2013, p. 42). Accordingly, an individual can experience existence, sense, use, and achievement of choice:

- The existence of choice requires the choice to be available to the individual;
- sense of choice is when an individual understands that a choice is open to them;
- use of choice is when a person makes use of the choice; and
- achievement of choice is when the development outcomes align with what the choice was meant to achieve.

In the top left of the CF, the structures that frame people's lives are: institutions and organizations, discourses, policies and programs, formal and informal norms, as well as technologies and innovations. These components form the context in which human development takes place. The addition and placement of structure in the CF is a pointed departure from the approach articulated by Sen (1999). Sen's CA has been criticized as being too apolitical and neglecting aspects of power, politics and structure (Roberts, 2016): Kleine (2011) responds with the inclusion of structure, which includes the exercise of power through its constitutive elements. She underscores the importance of structure when applying the CA to development work because she believes that agency cannot be decoupled from the context in which it is enacted. This contrasts with Sen (1999), whose emphasis on agency belies the fact that structural elements can strongly influence development outcomes. Kleine's CF therefore creates a space in which structure may be considered alongside agency. Moreover, the CF is encouraged to be applied in the field of ICT4D, especially given the inclusion of technologies and innovations as a highlighted structural element in the framework that can affect the development outcomes an individual can realize. To this end, other ICT4D researchers have used the tool to undertake complex analyses of human experiences (Coelho, Segatto, & Frega, 2015; Poveda, 2015). However, none yet have done so in educational settings.

In the bottom left of the CF, agency is a force which draws on 11 resources: educational, social, psychological, natural, information, material, financial, geographical, cultural, health, and time. In the CF, as an individual uses her agency to draw on her resource portfolio to navigate the social structure of her life, capabilities arise. For example, through a combination of time, geographical resources (e.g. a walkable surface), and health at a minimum, a person could have the opportunity to develop mobility as a capability. By

supplementing geographical resources and health with a financial resource such as money to purchase a material resource (such a bicycle), plus educational resources (ability to ride it), one's mobility as a capability can be expanded.

The CF has been used in a gender-sensitive analysis of the adoption of ICTs in a rural Chilean community (Kleine, 2013). The study recognized time use among women as an influential aspect of agency: Kleine (ibid.) documented how time could be constrained by gendered norms on the use of time, often affecting women in negative ways more often when compared to male community members. These outcomes resulted in the addition of time as a resource in the CF.

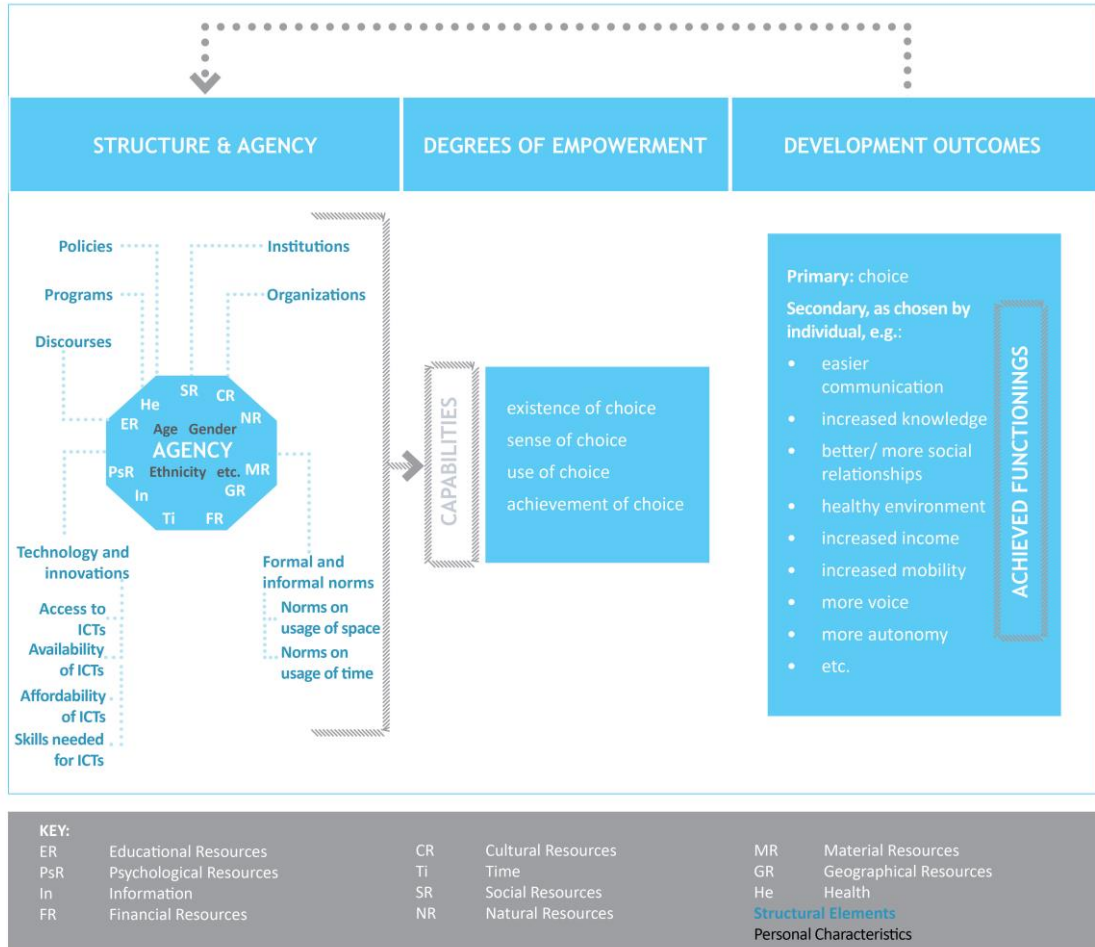
During the past ten years, the CF has also emerged as an evaluative space in ICT4D. The CF is a useful tool for conducting capabilities-based investigations with children because it can help researchers avoid reductionist generalizations about phenomena observed – a common occurrence in child-focused research (Amin, 2009; Kleine, Hollow, & Poveda, 2013). This is made possible because, in addition to guiding evaluations and analyses, the tool offers a systematic approach to knowledge construction, especially for human development projects that involve ICTs (Kleine, 2010).

While use of the CF to conduct research with children has not previously been carried out (ICT4D Collective, 2016), I decided to apply the CF in my study with secondary school girls in Nairobi because it could provide a degree of order to what was an intricate undertaking. The tool could also be employed at each stage of the research process, as a support to guide action as I used it to:

1. map the human development process and context, as well as thematically combine the data that emerges;
2. plan the research design in a way to support the girl learners as they endeavor to lead the valued lives to which they aspire; and
3. critically observe and evaluate a human development process, particularly the implementation and evaluation phases of an action research project.

However, based on my reading of Kleine's (2013) operationalization of the CA, I found that the CF was not diagrammatically presented in a way that I thought conveyed the relationship well between structure and agency. Kleine repeatedly argues that an individual uses their resource-based agency to navigate the structure they live in as they try to lead lives they have a reason to value. To me, this suggests that one's structure encompasses their agency, and that the two are inextricably linked. **Figure 3.2** below takes this understanding to reimagine the Choice Framework in a manner that I think best fits the explanation Kleine (2013) provides.

**Figure 3.2**



*Reimagined Choice Framework. Developed by the Author based on Kleine (2013)*

Moving forward, this is the version of the CF that will be applied in this study.

The CF design reflects the multi-faceted nature of the human experience. Nevertheless, other academics have criticized the CF for being too complex: Stillman (2015) argued that application of the CF is practically challenging because of the multiple analytical points to be considered. However, Tacchi (2013) stated that Kleine uses the CF to challenge the oversimplification of ICT4D project assessment; the tool design acknowledges that understanding development impact cannot always be simply reduced.

In this study, I examined the action research experiences of 22 girls. This meant that one challenge in choosing the CF to operationalize the CA was that there were more than 30 components to consider (please refer to **Figure 3.2** above) for each research participant. Because of this, I had to balance the depth of the analytical discussion given the space constraints of this thesis with the goal to systematically assess multiple areas of the girls' lives shaped by their participation in this study. Kleine (2013) faced a similar challenge in her own work when she applied the CF to evaluate a community telecenter project in Chile. Nonetheless, achieving this balance was key to creating a holistic, nuanced picture of the

action research process from the girls' perspectives. As will be seen later in the analysis chapters, tensions between depth and breadth recur, as not all 11 resources and nine structural elements can be discussed at length.

One way that the CF was adopted for evaluative purposes in this study was by using the framework to generate subsidiary research questions (SRQs) that would help answer the main research question: *How, if at all, might the introduction of mobile tools impact the girls' desired primary development outcome of having choice to increase their access to educational content after school?* To do this, I distilled the CF (excluding the development outcomes since this is encompassed in the main research question) into five chief conceptual areas: the degrees of empowerment; local norms; local technologies and innovations and accompanying access to them; local policies, discourses, and institutions; and resource-based agency. Based on this breakdown, and considering the main research question, I added the following SRQs to guide the inquiry activities during the action research phases:

1. Do the girls view the mobile phone as a tool to facilitate IATECAS? (SRQ1)
2. How, if at all, do norms on the use of time affect the girls' mobile use to IATECAS? (SRQ2)
3. How, if at all, do norms on the use of space affect the girls' mobile use to IATECAS? (SRQ3)
4. How, if at all, does access to mobile phones affect the girls' mobile use to IATECAS? (SRQ4)
5. How, if at all, do policies, discourses, and institutions affect the girls' mobile use to IATECAS? (SRQ5)
6. How, if at all, does the resource portfolio available to the girls affect their mobile use to IATECAS? (SRQ6)

Like what was seen earlier with the limitations of the depth and breadth of the analysis, here, only the structural and agency-based components most relevant to this study will be explored in these SRQs.

The main research question is intended to help shed light on the development outcomes achieved by the end of this study, if any. The first SRQ engages with the degrees of empowerment, namely whether the girls experience the existence, sense, use, and achievement of choice with respect to their ability to realize the primary development outcome of having choice to increase their access to educational content after school. SRQs 2 through 5 look specifically at structural elements of the girls' lives and SRQ6 is intended to examine the resource-based agency elements, all of which may influence the development outcomes realized through this intervention. By focusing on these CF areas, and considering

the research participants' structure and agency directly, the intention is to assess how, if at all, for whom, and why or why not this education action research intervention contributes to freedom expansion among the 22 research participants in a way that they have a reason to value.

### 3.6. Conclusion

In this chapter, I have outlined the foundation on which this people-centered action research is based; first positioning Sen's capability approach as the primary normative lens through which I critically view the research process. The capability approach has been utilized in education and ICT4D as an alternative to the growth-centric approaches to international development. Although the CA is driven by helping people lead the lives they have reason to value, children have infrequently been the subjects of human-centered development interventions. This is a gap in the literature this research intends to contribute to with girl children as the subjects. With this framework established, I moved to examine conceptualizations of time and mobility, illustrating their socially constructed origins, and drawing links to the capabilities literature. I concluded by introducing the CA operationalization I adopted for this study, the Choice Framework, and elaborating subsidiary research questions that will help me seek answers to the main research question. It is my intention to appropriate this tool in a manner which reflects what happens in the 22 research participants' lives during this 13-month education action research intervention. In the next chapter, I will situate this study in the research context where the investigation was carried out.

## Chapter 4: The After-School Research Context

### 4.1. Introduction

In Chapter 3, I introduced the Choice Framework as the guiding framework for this study. I explained how it can be used in three ways in ICT4D work: for project evaluation, to map the development process, and to support action research design. In Chapters 6 through 8, the CF will be applied in an analytical and evaluative fashion; in Chapter 5 it will be used to undertake design considerations to help facilitate choice expansion during the intervention. In this chapter, I will use the tool to help map the action research context, particularly highlighting policies, programs, institutions, and technologies, as well as time, educational, financial, material, and geographical resources documented that influenced the study. My aim is to set the scene so that decisions made, actions taken, and knowledge constructed in subsequent chapters can be better understood through this contextualization.

The chapter will be divided as follows: In the first half, I will discuss the macro-context of the study, giving attention to Kenya and the structuring of education and ICTs, particularly with respect to girl children. In the second half, I will foreground Nairobi and New Day Secondary School, the micro-context in which this study occurred. The aim will be to provide a sharper focus on the places which strongly shaped the 22 research participants' experiences of girlhood, especially the after-school environment. This exploration will provide a contextual framing which will be critical to understanding the girls' expressed development outcomes and enablers and constraints present when this action research was conducted.

### 4.2. Macro-Context

#### 4.2.1. Kenya

Kenya, the geographical and economic heart of East Africa, is bordered by five countries: Tanzania to the south, Uganda to the west, South Sudan to the northwest, Ethiopia to the north, and Somalia to the east (see **Figure 4.1**).

Figure 4.1



*Map of Kenya and bordering countries. (Wikipedia Commons, 2011, Retrieved June 28, 2016, from [https://commons.wikimedia.org/wiki/Category:Maps\\_of\\_Kenya#/media/File:Ke-map.png](https://commons.wikimedia.org/wiki/Category:Maps_of_Kenya#/media/File:Ke-map.png))*

In 2014, when this study was initiated, there were 44.8 million people living in Kenya (World Bank, 2014a). Officially, there are 42 ethnic groups that comprise the population. However, due to the limited options available when asked about their ethnic group or tribal affiliation on the census, and that the government has previously classified smaller groups as part of larger ones, an academic estimates that there are at least 111 ethnic groups in Kenya (G. Lynch, 2014). Of these groups, listed in order of size, the Kikuyu, Luhya, Luo, Kamba, and Kalenjin combined constitute approximately 70% of the population (Marhoum & Samper, 1998).

Kenya is the wealthiest country in the EAC (Gundan, 2014). Since 2009, Kenya has outperformed projections for its economic growth each year (The World Bank, 2016). Nevertheless, there is a great deal of inequality in the country due to an imbalance in the distribution of its resources (Handjiski, 2015). This inequality has been influenced in part by a system of patronage related to the dominance of some ethnic groups when compared to others (Githongo, 2006; Kagwanja & Southall, 2009). The location, history, demographics, politics, and economy collectively shape education and the appropriation of ICTs in Kenya. I will explore these influences in the subsequent sections.



#### 4.2.2. Kenya's Education System

Prior to the arrival of missionaries in the mid-19<sup>th</sup> century in Kenya, there existed traditional educational models unique to each tribe which guided human development. These approaches were often tied to age:

Among certain ethnic groups for example the Luo's [sic] of Western Kenya, knowledge and wisdom is perceived to advance with the age of individuals based on their experiences with life. Acquisition of this form of knowledge is through interaction with daily experiences of the realities of the world reflecting capabilities, priorities, and value systems of members of the community. [...] During initiation into adulthood among the Kikuyu, Maasai, Luhya, and Kalenjin communities, the elders prepare youths for their transitional roles and responsibilities in adulthood. In a way, this is formal education for the age sets. (Owuor, 2007, pp. 23–24)

The topics integrated into traditional education included citizenship and service to one's community, long-established rituals, values, spirituality, and work such as trades and medicinal practices. But, traditional education, family- and community-oriented in nature, was not gender equal in the sense that young women and girls were raised to assume mostly domestic positions like caring for children; young men and boys were groomed for positions outside of the home like animal husbandry. However, this inequality in roles and professions was not usually present when it came to recognizing the importance of women's and girls' contributions to their communities (Owuor, 2007). There was also the belief that education was a lifelong process transmitted through generations, that education began at home, and this education was not contained in a formal institution like a school (Adeyemi & Adeyinka, 2003). Furthermore, language was an important part of the identity that people acquired through traditional education, and people were taught life lessons in their mother tongue (ibid.).

Once Christian missionaries arrived in Kenya, traditional education practices were systematically dismantled, in part to promote African compliance and subservience to the colonial government. Perhaps the biggest challenge to traditional education in Kenya was the introduction of school as a formal institution: Many tribal elders opposed formal schooling because they (rightly) perceived it as a threat to their authority (Urch, 1971). Eventually, other damaging measures were imposed by the British such as the spread of Christianity and imposition of English as the language of government (ibid.). At times, the British exhibited sensitivity to existing educational processes and features in Kenya, for example, by evaluating the failures of colonial education in the early 1920s and using the findings to attempt to make the education of black Africans less individually competitive to align with the more family- and community-oriented style that was extant before colonization (Bude, 1983). Nonetheless, the overall desire to cement a system of social stratification that benefited Europeans caused extensive damage to the socio-educational fabric of Kenya's original inhabitants (Sheffield,

1971). The post-independence education system mirrored that of the UK, and remained in place until the mid-1980s (Buchmann, 1999). Since 1985, the 8-4-4 system has been adopted: This structure extended the length of primary education to eight years, combined secondary education into one four-year cycle instead of the British four years plus two years approach, and post-secondary education was expanded to four years instead of three (Somerset, 2009).

Despite lingering cultural mismatches when compared to traditional education structures and delivery mechanisms, the Western style of education has come to be valued as a means for human development in Kenya, bolstered by several government policies and programs (Oketch, Mutisya, & Sagwe, 2012; Oketch & Rolleston, 2007; Oketch & Somerset, 2010). The push to achieve targets elaborated in international commitments like the Millennium Development Goals (MDGs) has also underscored the importance of education in the government's development agenda. Yet, access to and the quality of schooling varies drastically in Kenya, partially because of ongoing inequalities among ethnic groups (Alwy & Schech, 2004). Additionally, government policies and programs stimulated a demand for school attendance which has outstripped its supply due to a lack of funding (Glennerster, Kremer, Mbiti, & Takavarasha, 2011). This combination of barriers in Kenya's education system has had implications in two areas that have relevance to this study: girls' education and ICTs in education.

#### 4.2.3. Girls' Education in Kenya

Girls' education in Kenya is a major area where damage to traditional education practices can be observed. As discussed earlier, while girls were primarily expected to fill domestic roles, they were nevertheless considered vital to the functioning of their societies (Shabaya & Konadu-Agyemang, 2004). The arrival of missionaries contributed to the intensification of existing inequality in the gender roles among different communities in Kenya, for example, regarding acceptable and unacceptable behaviors for girls and women.

As the British colonization of Kenya progressed after the late 1890s, and the need for educated male labor skyrocketed, girls' education in Kenya suffered: "This novel set-up only helped to alienate African women by offering them the lowest quality and quantity of education relative to their male counterparts as well as compared to the women and men of other races," (F. Chege & Sifuna, 2006a, p. 19). Poor education quality and delivery further weakened community ties among the genders, affirmed male dominance as the main income earner, and discouraged equal educational attainment among family members.

Despite the international development community's view that 'education is for all,' and that schooling is a necessary component of human development, girls in Kenya continue to be left behind: In 2009, while the percentage of girls enrolled in primary education was higher than that of boys (83% girls versus 82% boys), numbers at the secondary level dropped

precipitously for both sexes, and girls' educational participation was lower than boys' (48% girls versus 51% boys) (UNESCO, 2012a).

Higher enrollment rates at the primary level are because of the government's universal primary education (UPE) policy initiated in 2003. UPE was designed to ensure every Kenyan child of primary school age received an education free of tuition fees (Oketch & Somerset, 2010). A swell in attendance was documented, but at the expense of educational quality since the demand for this 'free' education placed a strain on limited resources at the household and national levels (Glennester et al., 2011). 'Free' is placed in quotes since parents are still responsible for purchasing uniforms, books, and other supplies for their children to participate in primary schooling (Oketch et al., 2012). This makes sending children to school expensive, especially for the poor, even without tuition costs. For secondary schooling, attendance costs are substantially higher (Juma, Simatwa, & Ayodo, 2012; Ndiku, 2007; Ndiku & Lucy, 2013). This is because secondary education has not yet been made free in practice despite a policy that mandates it should be free (Ohba, 2011). Accordingly, families must cope with the associated attendance costs and pay for their child's tuition.

Frequently, attitudes about the value of girls' education means that some families in Kenya are unable or unwilling to help their daughters continue schooling beyond the first eight years (Kiragu, Warrington, Rarieya, & Githitho-Murithi, 2012; Mensch & Lloyd, 1998). Shabaya and Konadu-Agyemang (2004) also found that geography has implications for girls' education in Kenya: "Nationally, whereas only 16% of females have secondary education, the figure is as high as 43% for the Nairobi region, and as low as 12.5% in the Nyanza region. Urban females are also more educated than their rural counterparts [...]," (p. 407). In comparison to rural contexts like Nyanza, Nairobi, as the capital city, benefits from more possible economic activity that households can take part in to raise school fees for their daughters.

Nevertheless, irrespective of location, the following factors also all place downward pressure on girls' secondary education participation: government policies, social norms, curriculum content, teachers' attitudes towards girls' abilities and the subjects they should study, gender-based violence, and a lack of role models (Sifuna, 2006). The inequalities in girls' ICT access are comparable to but not as severe as those seen in education. Yet, as the Government of Kenya continues to explore ways to enhance and expand educational opportunities through ICT appropriation, particularly personal computers, the links to girls' education must also be considered.

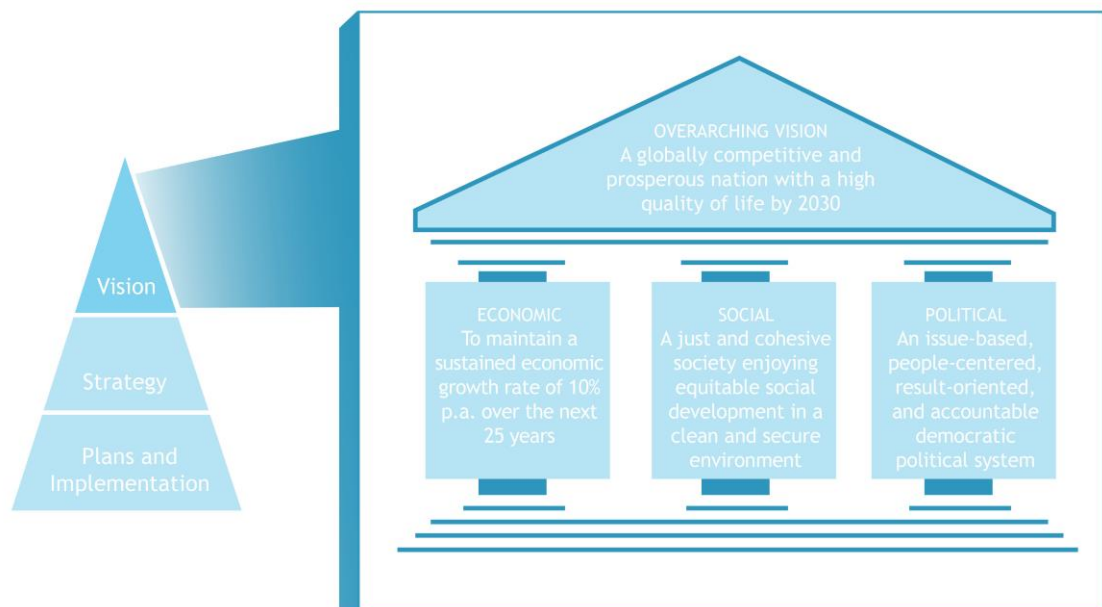
#### 4.2.4. ICTs in Kenyan Education

As work towards education-related MDGs began in 2000, efforts to transform the Kenyan ICT sector occurred in parallel. Computers were first brought to Kenya in the late 1970s, with full internet access established in 1995 (Ford, 2007). By the year 2000, there were only three

internet users per 100 people in Kenya (World Bank, 2014a). In the same year, a national consultation was launched to develop an ICT strategy which promoted socio-economic development (Waema, 2005). This consultation brought together a multi-stakeholder coalition which included representatives from education, the private sector, and existing ICT users. Yet, despite several recommendations, a new government ICT policy was not established (ibid.).

Between 2007 and 2008, a government plan and a national policy pivotal to the emergence of ICTs in education in Kenya were put in place: The Vision 2030 national development plan and a ban on students carrying mobile phones to school, respectively. The Vision 2030 plan (see **Figure 4.2**) was launched in 2007 and covers five-year spans until the year 2030.

**Figure 4.2**



*Kenya's Vision 2030 development plan. (Adapted from Kenya Investment Authority, 2011, Retrieved June 29, 2016, from <http://broadbandtoolkit.org/Images/w716/Photo/Photo/77/5ced92ec3e210cc6dd658627fca8fcca>)*

One goal of the plan is to promote the advancement of science, technology, and innovation (STI). Human capacity building around technological skills is one area where contributions to STI development is thought to be possible (Republic of Kenya, 2007). Within this plan, STI was positioned as part of the foundation for socio-economic development. Education and training, gender, youth, and vulnerable groups, and social equity and poverty reduction were all designated as social pillars which complemented the economic and political pillars. This arrangement meant that STI was intended to make a positive impact on education, gender, youth, and equity issues in Kenya.

Since 2006, the Kenya Institute of Curriculum Development (KICD)<sup>7</sup> has been the government body responsible for integrating ICTs into education. Although computers had

<sup>7</sup> Formerly the Kenya Institute of Education, or KIE.

been used in higher education to a certain extent prior to this time (Ford, 2007), ICT access in other education levels was more uncommon. Over time, KICD has since been tasked with promoting digital content and internet service in primary and secondary education so that digital literacy skills might be developed in both teachers and learners (KICD, 2016; Ouma, Awuor, & Kyambo, 2013). The government has linked this work by KICD to the Vision 2030 plan to promote the advancement of STI (Ministry of Education, 2012).

To date, the Kenyan government's work to digitally enhance education delivery has focused on building and/or installing the necessary infrastructure (e.g., electricity sources, secured computer labs, computer hardware, internet connections, etc.), developing a curriculum, and training teachers to use computers (Hennessy et al., 2010). Yet, along with computer use in education come a variety of structural- and resource-based barriers that hinder widespread adoption, such as outdated hardware, high costs, a lack of skills, and even teachers' fears about potential job loss because of the technology introduction (Martin Mungai, 2011).

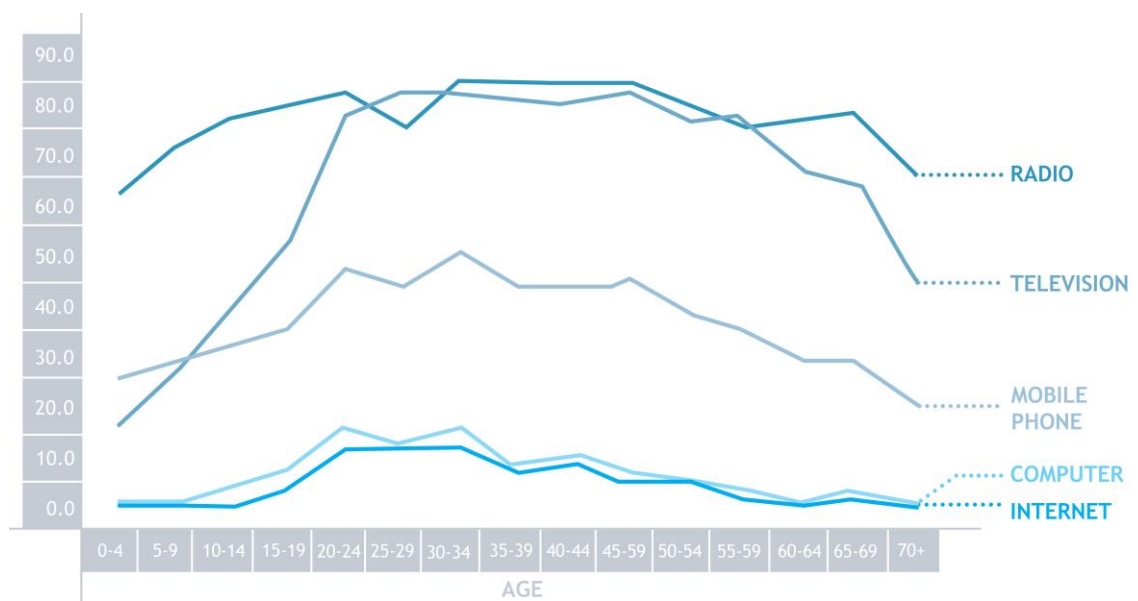
The choice of computers to realize the ICTs in education is questionable given changes that have taken place in Kenya since the launch of the Vision 2030 plan. From 2005 onward, the telecommunications industry was liberalized, driving down costs, and increasing demand for mobile ownership (IFC, 2013; Shapshak, 2012). By 2012, the number of internet users in Kenya per 100 people had grown to 32.1 (World Bank, 2014a). Much of this growth came from mobile-based internet access as the spread of mobile telephony grew rapidly: When this research was initiated in December 2013, of the 44.8 million people in Kenya, there were 21.6 million unique mobile subscribers (or SIM cards held), 17.9 million of whom had access to the mobile internet (GSMA Intelligence, 2016). However, it should be noted that the number of unique mobile subscribers does not account for the fact that some users may own more than one SIM. This obscures the true number of unique mobile subscribers in the country. Even accounting for this possibly lower number of unique mobile subscribers, in contrast, there were only approximately 99,000 internet subscribers through means other than mobile data (CAK, 2014). Examining changes in mobile access with a gender lens, in a nationally representative household ICT survey conducted in Kenya between 2011 and 2012, 67.9% of girls and women owned a mobile phone compared to 46.9% when the same survey was conducted between 2007 and 2008 (Gillwald & Deen-Swarray, 2013). This suggests growth in mobile access among Kenyan women and girls since 2005.

A national policy that affected ICTs in education in Kenya was the ban on students carrying mobile phones to schools. In the aftermath of the 2007-2008 post-election violence, former Education Minister Sam Ongeri declared:

...In order to stem off this crisis that has developed in our schools, we have decided to take the following measures. [...] From today, ban the use of mobile phones in all our educational institutions. Finally, allow me to emphasize here that our schools and other institutions of learning shall not be safe havens for any criminal elements and, therefore, we are banning the use of mobile phones by students in all our institutions. (Kenya National Assembly, 2008, pp. 1964–1965)

This policy was implemented in response to instances where youth used their phones to contribute to unrest (Trucano, 2015a). Because of this, despite the fact that second to radio, mobile is the most ubiquitous ICT in Kenya (see **Figure 4.3**)<sup>8</sup>, it has not been widely adopted to support education delivery apart from limited functions like SMS notifications to communicate exam results (KASNEB, n.d.).

**Figure 4.3**



*Proportion of Population with Access to Some Selected ICT Equipments (3+). (Adapted from National ICT Survey Report, Kenya National Bureau of Statistics and Communications Commission of Kenya, 2011, Retrieved June 29, 2016, from <http://ca.go.ke/images/downloads/RESEARCH/Report%20on%20National%20ICT%20Survey.pdf>)*

The differences in access to mobiles and computers I highlighted earlier suggest that the government policy banning mobile phones in schools impedes ICT integration in education – especially for girls who have historically had less access to, use of, and familiarity with computers when compared to boys. It is against this backdrop that action research was undertaken which made use of mobile technology after school with Kenyan girls enrolled at the secondary level.

<sup>8</sup> Data in this figure is based on a survey conducted in Kenya in May and June 2010 by two government agencies. A representative sample was developed to mirror characteristics of the population. There were 8,295 households sampled, of those 6,803 households successfully completed surveys.

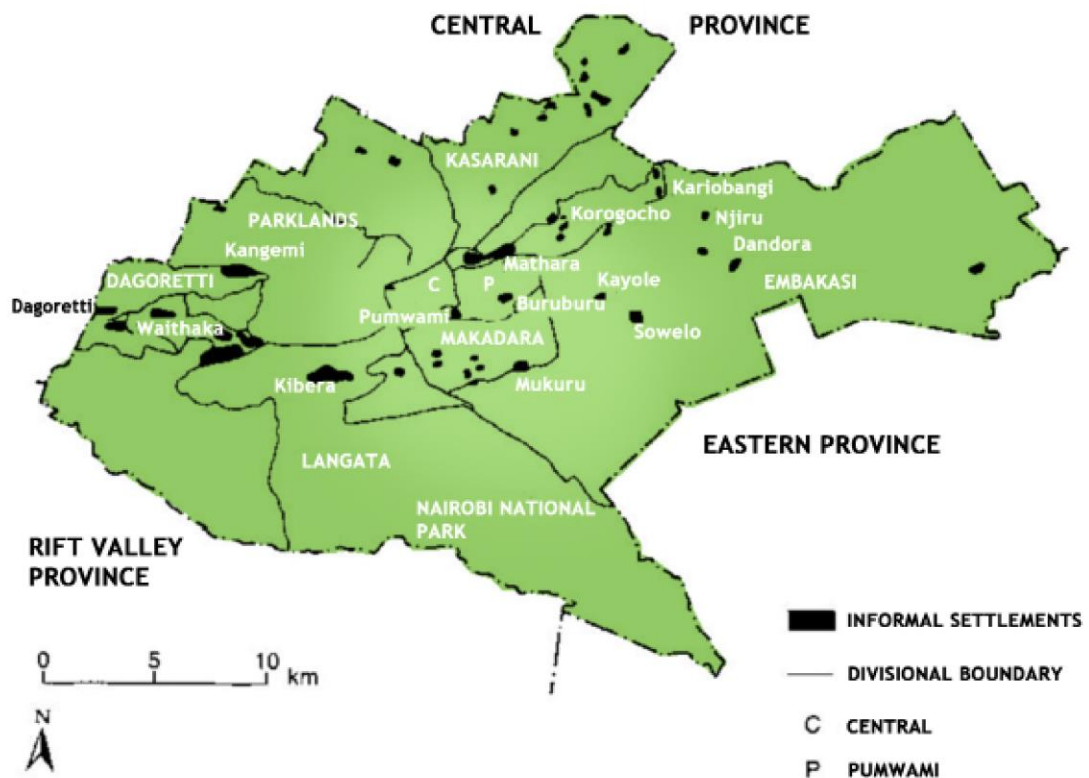
### 4.3. Micro-Context

#### 4.3.1. Nairobi

Nairobi is the capital and most populous city of Kenya, with over three million residents (UN Statistics Division, 2012). Owing to its favorable weather conditions and absence of malaria, Nairobi became the capital after the country was colonized by the British (Obudho, 1997; Otiso & Owusu, 2008). The colonial administration mapped and sectioned Nairobi along racial lines into three categories: White Europeans, Asians, and Africans (Obudho, 1992). The outcomes of this spatial manipulation under the auspices of hygiene were as follows (see **Figure 4.4** for reference):

North and East defined as the Asian Sector (Parklands, Pangani and Eastleigh); East and South East defined as the African Sector (Pumwani, Kariokor, and Donholm); South East to South marked another small Asian enclave before it was bounded by the Game Park (Nairobi South, and Nairobi West). Finally, the line North and West marked the European area. (K'Akumu & Olima, 2007)

**Figure 4.4**



*Nairobi: Informal settlements, 1992 (Obudho, 1992, p. 100)*

This division primarily benefited the white European settlers since they occupied the most valuable and sparsely populated land when compared to indigenous Kenyans who lived in densely populated areas (Otiso & Owusu, 2008). Areas of Nairobi historically inhabited by

black Africans continue to be outposts of the poor, and the Kenyan and foreigner elites that emerged post-independence remained in or moved into areas that had always benefited from the resources, particularly the infrastructure of the previous residents like running water and electrification (ibid.).

Olima's (2001) description of modern socio-spatial divisions in Nairobi underscores many of the inequalities which persist:

(a) Upper Nairobi lying to the west and north of the CBD [Central Business District]. It is an area of low density, high-income population [...] and comprises many of the former well-known expatriate residential areas [...].

(b) Parklands, Eastleigh and Nairobi South, an area of medium income, medium density population [...] and consists of mainly owner-occupier housing (many owned by Asians). [...]

(d) Eastlands in the marginalised urban fringe to the east of and away from the CBD, is a low-income densely-populated area [...] [known for] urban deprivation and disadvantage [...]. (pp. 6-7)

Particularly in the Eastlands, there are multiple informal settlements that have experienced an influx of people from rural areas seeking better livelihood opportunities (Mberu et al., 2013; Zulu et al., 2011). The exclusion that local, poor black African populations continue to experience because of where they were forced to live (geographical resources) has had a negative impact on the educational resources available to them. Such were the circumstances observed at the place that this study was conducted, a secondary school located in the Eastlands of Nairobi. I will now provide further details about the selection of NDSS as the study site.

#### 4.3.2. Mapping NDSS

NDSS is in the Makadara District of the Eastlands. The school is located near a major thoroughfare lined with informal market stalls, and is heavily trafficked by *matatus*, a common form of low-cost public transportation in Nairobi. The institution was established in 1969, initially as a school for children with special needs, before having its remit changed in the 1980s to serve secondary school girls of all abilities. The academic year at NDSS runs from January to November, with term breaks for three weeks in April and August.

The school grounds are co-located with a primary school. NDSS infrastructure consists of four main buildings around a central courtyard: The food preparation block, administrative block, teaching and learning block, and the sciences block where the laboratories are situated (see **Plate 4.1** to **Plate 4.5**). Additionally, there is an open area on the grounds with no buildings where school personnel and learners can practice farming techniques, sports, and host major events such as award ceremonies (see **Plate 4.6**).



**Plate 4.1**



*NDSS food preparation block (Author)*

**Plate 4.2**



*NDSS administrative block (Author)*

**Plate 4.3**



*NDSS teaching and learning block (Author)*

**Plate 4.4**



*NDSS central courtyard during a weekly Friday school-wide assembly (Author)*

**Plate 4.5**



*NDSS learners playing rugby in front of the sciences block (Author)*

#### Plate 4.6



The grounds and facilities of NDSS are kept tidy in appearance by the learners and occasionally some staff members. Despite the tidy appearance, there is little equipment available, analog or otherwise, to support teaching and learning: There were chalkboards with worn and uneven surfaces that made it difficult to fully erase past lessons; so, content for new lessons was not always clearly visible. The sole copy machine was usually operable but used sparingly due to fears about the machine breaking down, necessitating costly repairs. Lab equipment donated by the MoEST during the exploratory study in July 2013, per the Chemistry teacher, did not include all apparatuses needed to perform basic experiments. These circumstances arose because, despite the declaration of free secondary education made in 2008, families of children enrolled in secondary school are expected to plug their schools' large gaps in operational costs with financial resources from their own households (BBC News, 2008a, 2008b). The school population demographics meant that there were limited means available to meet all but the most critical resourcing needs of the institution. Nevertheless, what NDSS lacked in facilities was balanced by what I observed to be a tight-knit, convivial group of educators whose shared passion for supporting the learners at school resulted in initiatives such as pooling monies to make equipment purchases or paying part of school fees for girls when their families fell on hard times financially.

#### 4.3.3. NDSS Student Demographics

NDSS is a district school, the third and lowest tier of the secondary school classification in the country; the next tier is provincial, and the highest tier is a national secondary school (Alwy & Schech, 2004). This means that most of the student population earned a low score on the Kenya Certificate of Primary Education (KCPE) examination, an assessment which marks the

transition from primary to secondary school. The KCPE score determines which secondary school tier a child qualifies to attend, and the provincial and national tiers have higher admission standards than the district tier in terms of the student academic profile they will admit. Approximately 10% of the girls who attended NDSS at the time of the study had earned a B grade or higher on the KCPE but could not raise the requisite school fees to attend the more expensive and better equipped national or provincial schools,<sup>9</sup> in part because attending these schools would incur additional costs for boarding because the schools usually were not located near where the learners lived. Thus, these girls enrolled at NDSS because it was more affordable and closer to where they lived.

NDSS was led by Principal Patricia Sumba<sup>10</sup>, herself a PhD student interested in how school administrators can support returns to school for young mothers. Principal Sumba oversaw a faculty of 25 teachers in various subjects and a staff of eight employees for facilities and administration. Faculty and staff at NDSS represented a wide range of Kenya's ethnic groups. While the faculty and staff were sometimes demotivated by the conditions at NDSS, transfers to other schools with better resources and stronger student KCPE scores were rare: Over 70% of the faculty and staff had taught at NDSS for more than two years.

At the time of the study, approximately 400 girls were enrolled at NDSS, ranging in age from 14 to 20. Although the learners were also ethnically diverse in terms of tribal affiliation, the biggest group among the student body was Luhya. I observed at least 10 girls who practiced the Islamic faith (indicated by wearing a hijab in the school colors), but most girls, like the NDSS faculty and staff, identified as Christians. According to estimates from the principal and a head teacher at NDSS, Julie Omolo, at least 85% of the student population came from households suffering regular economic shocks due to household heads' engagement in vulnerable informal or seasonal employment, and a combination of unexpected financial losses resulting from circumstances such as health issues, deaths of family members, or robberies. There were a few child-headed households among the student population, at least five teen mothers, and approximately half of the girls lived with guardians, who may or may not have been related to them.

The cost to families to send a girl to NDSS for an academic year as a day student (non-residential) was 25,000 KES (approximately US\$246). A MoEST document from 2008 indicates that the government provided 10,265 KES per child (approximately US\$101) towards the cost of secondary school attendance that year, of which only 3600 KES (approximately US\$36) was allocated to tuition costs (Ndiku & Lucy, 2013). A government communiqué shared with me by

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<sup>9</sup> Based on a review of school fees at a provincial and national school in Kenya at the time of this study, the fees were at least one and a half times more than NDSS.

<sup>10</sup> A pseudonym.

Principal Sumba in July 2013 which was dated January 2013 showed that the government funding had only marginally increased to 10,500 KES (approximately US\$103) within five years. Yet, Principal Sumba stated that even this amount was not always paid in full because the government claimed that the increasing number of teacher strikes over contractual pay was negatively impacting their ability to do so. The principal's claims about the government withholding funds were repeated elsewhere in Kenya in 2008 when 'free' secondary education was introduced: "Sylvester Wambua, the head teacher at Kyanguli Memorial School, says the delay is threatening operations at the institution. 'The government is supposed to give us \$95,861 - they have only given us \$19,354,'" (BBC News, 2008b). With no other recourse, Principal Sumba had to pass the operational costs funding gap on to the families of girls enrolled at NDSS – families for whom raising over 15,000 KES (or about US\$171) for one child was a formidable task.

Learners at NDSS lived in some of the most impoverished areas of Nairobi, including Eastleigh, Kariobangi, Bahati, and Jericho (please refer again to **Figure 4.4** in sub-section 4.3.1.). With the money remaining in a household after rent, costs to send a girl to NDSS could represent a substantial portion of available income (Olima, 2001). With nearly 40% of all urban households in Kenya comprised of four or more people in 2014 (KNBS, 2014), limited financial resources had to be stretched far to make ends meet. Perhaps paradoxically, a mobile phone was usually owned by at least one person in a household where an NDSS learner was a family member: Based on a survey I conducted in 2012 with a third of the NDSS student population as part of research for my Master's thesis, I found that just over 45% of the girls owned their own mobile phone (Zelezny-Green, 2012). As such, although schooling costs were a substantial expenditure for NDSS community members, mobile ownership, despite its own high cost, appeared to be a necessity for communication, money transfers, and increasingly, information. Still, the potential mobility – educational, social, and economic – that is associated with educational attainment in Kenya remained a major incentive for families to send their daughters to school.

#### 4.3.4. A School Day for an NDSS Learner

From data I gathered at NDSS in July and August 2013 during an exploratory study before the start of the action research process, I constructed a typical schedule for girls enrolled at the institution (see **Table 4-1**). To an extent, the school day had an established rhythm, though there were undoubtedly differences among learners based on their circumstances at home.

**Table 4-1**

Time Period	Activity
4:30 - 6:00 am	Wake up, preparations for school including cooking and eating breakfast
6:00 - 7:00 am	Travel to school
7:00 - 7:30 am	Perform school maintenance activities
7:30 am - 3:30 pm	Attend classes at NDSS
3:30 - 6:00 pm	Participate in extended school day at NDSS (school maintenance, extracurricular activi-
6:00 - 7:00 pm	Travel back home
7:00 - 9:00 pm	Perform chores including dinner preparation, washing dishes, etc.
9:00 - 9:30 pm	Eat dinner
9:30 - 10:00 pm	Clean up
10:00 - 11:00 pm	Complete schoolwork: revising, reading, studying, homework completion
11:00 pm - 4:30	Sleep

*Day in the life of a typical NDSS student (Author)*

From the above schedule, we see that for most of their waking hours, NDSS learners were usually engaged in activities which were controlled by adults. However, the girls were accorded two breaks during the formal school hours, once in the morning for 15 minutes and again in the afternoon for the same time length. The commutes from home to school and back were the times during the school day when the girls were free from adult surveillance, although parents and guardians still had the ability to influence the routes taken home, journey lengths, and modes of transport taken.

The learners were at NDSS for a minimum of 11 hours each day Monday to Friday, and had about five hours after school before they slept for five and a half hours. Most of the time the girls spent away from NDSS involved domestic labor or travel, with the opportunity for performing activities related to learning usually two hours or less – and on average just an hour per day. Because of the policy banning mobile phones at school, the girls’ phone use was usually only possible in out-of-school settings. School as an institution in this context was in

many ways a centerpiece of adolescence among the student population, framing the girls' lives, time, and mobility even when they were not present on campus. At the same time, however, their experiences during after-school hours, and particularly at home, were similarly influential as the subsequent chapters will illustrate.

#### 4.4. Conclusion

Though this study was conducted in the twenty-first century, in this chapter I have demonstrated how Kenya's colonial past has maintained a strong influence on education in the country, particularly for girls. Since the year 2000, the government has sought to transform education by increasing access to ICTs to enhance teaching and learning. But mobile phones have largely been excluded in educational transformation efforts despite the reach and impact the technology has had in other areas of the society.

As the research site for this study, New Day Secondary School in many ways reflected broader societal trends related to education, ICTs, and girlhood in Kenya. I noted how the location and demographics of the school gave rise to infrastructural issues (e.g. the lack of basic school equipment) which derived from the relatively expensive school attendance costs in comparison to annual household incomes earned among the NDSS community. Nevertheless, nearly half of the school population had access to mobile phones – although the girls' use of the devices was restricted to after-school hours. Mobile use after school was generally limited by the time needed to travel from NDSS to a girls' home, and then her need to make domestic contributions. The sum of these structural elements and differential access to resources among the NDSS student population sets the scene for contextualizing the education action research design, which will be elaborated in the next chapter.

## Chapter 5: Methodology

### 5.1. Introduction

In Chapter 4, I presented the macro- and micro-contexts where this study was implemented. This established a foundation from which to understand the motivation and rationale for the methodology that was developed. Here, I will present the methodological approach undertaken in this study. Firstly, I will expound further on the research paradigm that shaped the methodology development before briefly restating the research questions. Following this, I will present the research methods chosen for data collection. In the latter part of the chapter, I will explore considerations related to my positionality as a researcher before specifying the ethical framework created and adopted for this study. I will conclude these discussions with the study limitations identified given the methodological design.

### 5.2. Grounding the Research Ontologically and Epistemologically

Before initiating the study design, it was necessary to consider the paradigm within which this research would be situated. I decided to assume a subjective ontology because, in contrast to an objective ontology which "...assumes that reality exists independently of our comprehension of it," (O’Gorman & MacIntosh, 2015), a subjective ontology places people’s own views at the heart of how reality is understood. A subjective ontology also creates space to acknowledge that reality is both socially constructed and value-laden. This people-centered perspective harmonizes with my use of the CA and the CF to ground the research conceptually. Though I adopted this interpretation of how reality is understood, I recognize that some aspects of reality, such as the laws of physics, by their nature are considered objectively.

When considering the nature of knowledge, how it is developed, and its validity, epistemologies from the positivist tradition were excluded given the decision to adopt a subjective ontology<sup>11</sup>. Interpretivist-influenced approaches to human inquiry, often linked with a subjective ontology, are contextual, open-ended, make few assumptions, and are sensitive to the voices of the people involved in the study (Howe, 1988). Action research (AR) is an interpretivist perspective for theorizing knowledge and is primarily concerned with knowing by doing (Bradbury & Reason, 2003). Reason and Bradbury (2001) state that AR is "...a participatory, democratic process concerned with developing practical knowing in the pursuit of worthwhile human purposes, grounded in a participatory worldview [...]," (p. 1). To paraphrase, AR is used to generate knowledge in parallel to performing activities that democratically enhance the well-being of people and their community (Brydon-Miller, Greenwood, & Maguire, 2003).

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<sup>11</sup> However, I acknowledge that researchers can still be both people-centered and positivist.



One reason I chose AR as the epistemological foundation was because it encourages researchers to put people first when undertaking investigations intended to effect change(s) that participants seek. Furthermore, AR is an approach increasingly used in educational settings in Africa by teachers and school community members who find it useful for working towards desired change, even when faced with manifold challenges that seem insurmountable (Rohleder, Swartz, Bozalek, Carolissen, & Leibowitz, 2008; Stuart & Kunje, 1998; L. Young & Barrett, 2001). Moreover, AR makes it possible to critically engage with and make further contributions to theory while taking action to effect change (Torrance & Pryor, 2001). These qualities of AR aligned with my inclination to conduct research while contributing to theoretical debates about how the CA can be operationalized to promote desired change in people's lives.

### 5.3. A Blended Research Inquiry

In this section of the chapter, I will explore two research approaches that guided the study methodology. The aim is to explain my rationale for adopting a methodological approach that was sensitive to conducting research with girl children living in a Global South context.

#### 5.4.1. Conducting People-Centered Research

In Rwanda, Rubagiza, Were and Sutherland (2011) argued that simply introducing technology into an educational setting does not guarantee that positive changes will occur. In fact, they find that a "techno-utopian" (ibid, p. 39) outlook without much regard for people can cause further disadvantage for people who may already experience marginalization. Winters (2015) similarly admonishes techno-centric views in mobile learning projects in the majority world, stating that people, particularly teachers, need to be better integrated into the design and deployment of educational technology to address persistent schooling challenges. Unwin (2009) stresses that ICT4D projects implemented with marginalized populations, including youth, women and girls, and poor people, should always make meeting the needs of these people central to project objectives. He suggests this approach could help avoid the risk of contributing to further marginalization and exclusion of the very groups one intends to support.

Because I was conducting research with a population considered to be vulnerable, Kenyan secondary school girls, it was imperative to put their needs first from both moral and ethical standpoints. This approach aligns with the theoretical perspective this thesis assumes, the CA (see Chapter 3), and acknowledges that people remain at the center of the study.

#### 5.4.2. Approaches for Research with Girls in Africa

The Association of African Women for Research and Development (AAWORD) concede that rejection of [European] methodologies established for doing research does not mean that new,

Afro-centric methodologies will be more valid or reliable when conducting research with African women and girls (Assié-Lumumba, 2001). Rather, they propose if Western methodologies are used, researchers should try to contextualize them as much as possible for the people who are the subjects of the study. This was relevant because I come from a Western context despite being a member of the African diaspora. accordingly, it was necessary to consider local mores, and adapt planned research activities to ensure that they were sensitive to and respectful of the research community.

Similar to arguments made against referring to the 'child' or 'children' as one, homogenous entity in educational research (S. Greene & Hill, 2005), my approach to working with the learners at NDSS was intended to "recog[nize] and interro[gate] difference," (Steady, 2004, p. 46) among them during the co-investigation. The goal was to treat the experiences of these Kenyan girls as unique and independent voices. This was done because I did not want to generalize the experience of girlhood.

Sanya (2013) suggests that research with women in Kenya that is sensitive to their eventual portrayal in academic literature can "[...] reveal the multiplicities of [their] [...] identities, which are sometimes depicted as stagnant or monolithic," (p. 13). Yet, Sanya and indeed other black and black African authors writing on research with African women (see for examples Wakunuma, 2013; Beoku-Betts, Adomako Ampofo, & Osirim, 2008; Beoku-Betts & Njambi, 2005; and Lewis, 2004) make no reference to African girls in these discussions. Instead, the experiences of and considerations for girls in Africa are subsumed into the broader category of African women. In this study, I acknowledged and created space for girls to be heard and positioned as research participants.

Overall, these approaches to research inquiry with girls in Nairobi sought to complement the people-centered approach threaded throughout this thesis. Together, these research approaches informed the research motivation and questions to be investigated during the action research process.

#### 5.4. Research Motivation and Questions: Towards Desired Change

The first step in an action research process is to identify an issue facing the community you will collaborate with to understand what they wish to change about their circumstances (Brydon-Miller & Maguire, 2009). Adapted for the CA, this would be to learn what constitutes the lives that research participants have a reason to value. As discussed in Chapter 1, data collected with NDSS during an exploratory study before the main action research phases became a starting point for this investigation. It was my intention through this work not to decide what the research participants may value in life, but rather to have them express their own desired development outcomes; their desired development outcomes would then inform the research design.

Many of the 400 girls who attended NDSS in 2014 were from low-income households. They confronted a variety of structural and resource-based constraints to attend and remain in school, including that many girls did not have a full set of textbooks needed for their classes. As home visits and semi-structured interviews revealed during the exploratory study (see section 1.2.), there was also a challenge to access books outside of school. This was because the high cost of textbooks relative to household income in Kenya causes a financial burden beyond what most families can cope with (UNESCO, 2015).

When I asked what was the most important learning tool the girls could have during the after-school hours, teachers, parents, the school principal, students, and recent graduates all believed that educational content found in books would be beneficial. This was because the stakeholders thought books could help them build knowledge, study better, become more learned, and attain further academic success. With my interest in mobile learning, I decided to explore whether action involving mobile tools might support the realization of changes the research participants desired by answering the following main research question: *How, if at all, might the introduction of mobile tools impact the girls' desired primary development outcome of having choice to increase their access to educational content after school?*

As I began to establish the theoretical foundation for this study, the decision to operationalize the CA with the Choice Framework enabled me to undertake a dialogue between the CF and the main research question. Doing so helped conceptually organize the more than 30 CF components in a manner that would facilitate the systematic application of the CF as an analytical and evaluative tool in this study. A total of six subsidiary research questions resulted from this engagement with the CF:

1. Do the girls view the mobile phone as a tool to facilitate IATECAS? (SRQ1)
2. How, if at all, do norms on the use of time affect the girls' mobile use to IATECAS? (SRQ2)
3. How, if at all, do norms on the use of space affect the girls' mobile use to IATECAS? (SRQ3)
4. How, if at all, does access to mobile phones affect the girls' mobile use to IATECAS? (SRQ4)
5. How, if at all, do policies, discourses, and institutions affect the girls' mobile use to IATECAS? (SRQ5)
6. How, if at all, does the resource portfolio available to the girls affect their mobile use to IATECAS? (SRQ6)

With the main research question and SRQs developed, I next initiated the study design, at times relying on the CF to inform the research methods selection.

## 5.5. Multiple Methods, Multiple Researchers

In this section, I will discuss why multiple methods and researchers were engaged for this study.

As the growth in the number of ICT for education (ICT4E) initiatives has continued apace in developing contexts, it has been noted that impact assessment far too often relies largely on self-reported data (Trucano, 2005). The weakness in adopting a purely self-reported approach is that, as research elsewhere has found, self-reported technology use can elicit socially desirable responses, relies on memories which may be imperfect, and is often biased and incongruent when compared to actual usage (Bellman, Lohse, & Johnson, 1999; Devaraj & Kohli, 2003; Straub, Limayem, & Karahanna-Eyaristo, 1995). Therefore, details of self-reported usage would not be sufficient to assess with a great degree of certainty whether the choices available to the girls increased, especially since a means of learning about their actual usage was available. By collecting usage statistics, a degree of objectivity was added to the data amassed.

As stated in sub-section 2.4.1., although there have been several mobile learning interventions undertaken in the Global South, many of these interventions have not been very transparent in terms of the data shared to document the effectiveness of the technology introduced. Heavy reliance on qualitative data that has not been triangulated, and an absence of real usage statistics received directly from the mobile devices to evaluate claims, has contributed to the incredulity that many practitioners and researchers hold towards ICT4E (Trucano, 2005). To mitigate this in my own study, I designed a two-pronged approach that 1) emphasized triangulation through use of multiple research methods of different types and 2) wherever possible sought to balance self-reported data vs. actual usage statistics. Greene, Caracelli, and Graham (1989) contend that use of multiple strategies in a research project can facilitate advantages such as triangulation and complementarity when uncovering potential answers to research questions posed.

I also engaged multiple researchers for this study. I employed Angela<sup>12</sup> during the Pre-Intervention and Intervention phases of the action research process, and Farah during the Evaluation phase. Angela was a recent graduate of NDSS to whom I was referred by Julie, a senior member of the faculty. Julie recommended Angela because the students at the school trusted her and she was thought to be mature and responsible in character. Farah was engaged following a recommendation from a fellow PhD researcher in Kenya. Farah was a young Kenyan woman experienced in conducting research with girls from impoverished backgrounds, and who lived in an informal settlement in Nairobi herself.

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<sup>12</sup> This is, like all names in this thesis, a pseudonym.

Angela was asked to be a part of this study in February 2014 and Farah was asked in January 2015. Prior to research support being commenced with Angela and Farah, I conducted a one day training session with them; Angela's was conducted face-to-face and Farah's was conducted by Skype since I had returned to London by that time. Although Angela's principal training occurred once, her training was essentially ongoing since we met periodically to prepare for implementing different research methods and to discuss how the study was being carried out and what changes, if any, might need to be made. This was done because she was a novice in the role of research assistant and to enable her to provide feedback on how she thought the study was running. In the training with both assistants, the purpose of the research was explained, the research methods to be undertaken were presented and discussed for input in case the two young women had suggestions for how to modify the methods in a way that could help make them more locally relevant, and time was allocated so they could ask questions related to the study. The ethical issues that might arise during the study were also unpacked, and actions to be taken depending on the circumstances encountered were outlined so that any potential harm to the research participants related to their study participation could be responded to quickly and in a professional manner.

At the end of the induction process, we discussed the need to maintain confidentiality for all the people and events which would be involved with the study. It was made clear that confidentiality was of utmost importance so that no one could identify the school or the learners, particularly since anonymity had been guaranteed to the research participants so that they could express themselves freely and honestly during the research activities. Issues of confidentiality were linked to privacy and data protection associated with the use of the two mobile tools for both the girls and the research assistants since, particularly in the case of Angela, the mobile tools would be used to communicate with the girl learners on occasion. The data generated through these exchanges also needed to remain confidential and anonymous to protect the girls' identities and those of the research assistants. At the end of the training, an agreement was signed between me and Angela and me and Farah which outlined the terms of their employment, the agreed compensation for their research support, when and how this compensation would be paid to them, along with statements confirming their agreement to maintain confidentiality during and after the study, and to protect any electronic data associated with the study that they may encounter during and after the study.

The research assistants were key to the investigation for at least two reasons. Firstly, I did not have strong local language skills – at times the usage of Swahili, Sheng, or a mother tongue language such as Kamba was vital to ensure that the girls understood questions posed during the study. Moreover, because Angela was a familiar figure to the girls, when working in after-school settings her presence could be more inconspicuous than my own.

Building on the use of multiple methods and researchers, I will now detail specifics of the mixed methods used for data collection.

### 5.6. Collecting Data across Action Research Phases

As explained in section 5.2, action research involves periodic reflection to assess the outcomes of actions put into practice during the study. The principal action I took was to introduce the 22 research participants to two mobile-based tools which could facilitate opportunities to engage in mobile reading. This was done to find out in what ways, if any, the actions might augment the choices available to the girls to increase their access to educational content after school. **Table 5-1** was created to help visualize the overall study flow for the multiple data collection methods selected.

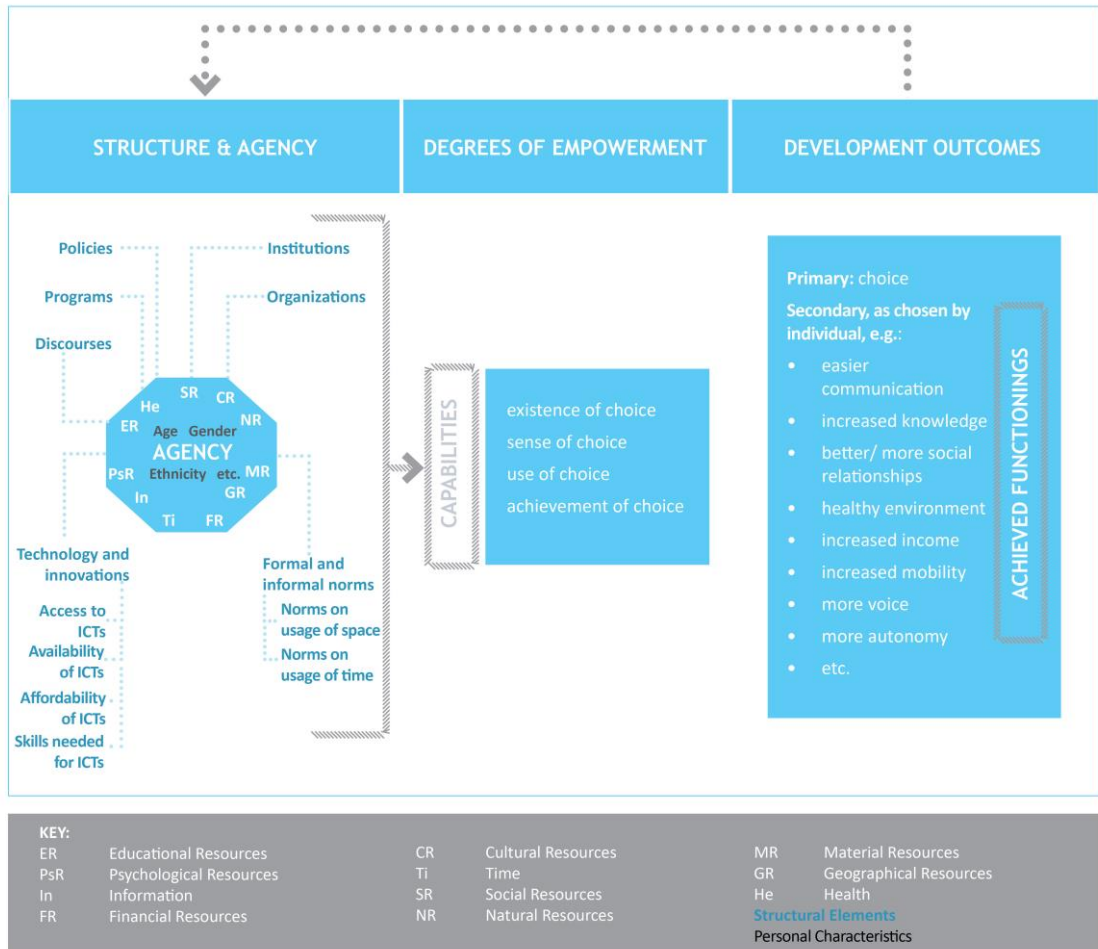
**Table 5-1**

Action Research Phase	Duration	Methods	Action Research Stage
Phase 1 Pre-Intervention	December 2013 to the final week of March 2014 <b>(four months)</b>	<ul style="list-style-type: none"> <li>Participant observation</li> <li>Research diary</li> <li>Structured interviews</li> <li>Focus group discussions</li> <li>Survey</li> </ul>	Find a starting point
Phase 2 Intervention	April 2014 to first week of December 2014 <b>(eight months)</b>	<ul style="list-style-type: none"> <li>Participant observation</li> <li>Research diary</li> <li>Ranking and association game</li> <li>Focus group discussions</li> <li>Structured interviews</li> <li>Card game</li> <li>Survey</li> <li>Remote participant observation by mobile</li> <li>App usage statistics</li> </ul>	Clarify the situation  Develop action strategies and put them into practice
Phase 3 Evaluation	December 2014 to January 2015 <b>(one month)</b>	<ul style="list-style-type: none"> <li>Participatory learning workshops</li> <li>Ranking and association game</li> <li>Survey</li> <li>App usage statistics</li> </ul>	Vaildate findings with research participants

*Mixed Methods, Qualitative Dominant Action Research Process at NDSS (Author, adapted from Stages of Action Research Processes Model by Altrichter, Posch, and Somekh, 1993)*

As seen in **Table 5-1**, once I identified the study’s starting point, taking action was complemented by a parallel process of reflection with support from the CF; this enabled me to consider a particular operationalization of the CA alongside educational practice (Winter & Munn-Giddings, 2001). To do this, once I implemented a course of action, I used the CF to reflect on and evaluate the impact that this action had for the girls and their desired development outcome. Given that there are more than 30 CF elements to consider (see **Figure 5.1**), this action-reflection process was performed for the girls as a collective with any observed exceptional responses to actions taken probed more deeply.

**Figure 5.1**

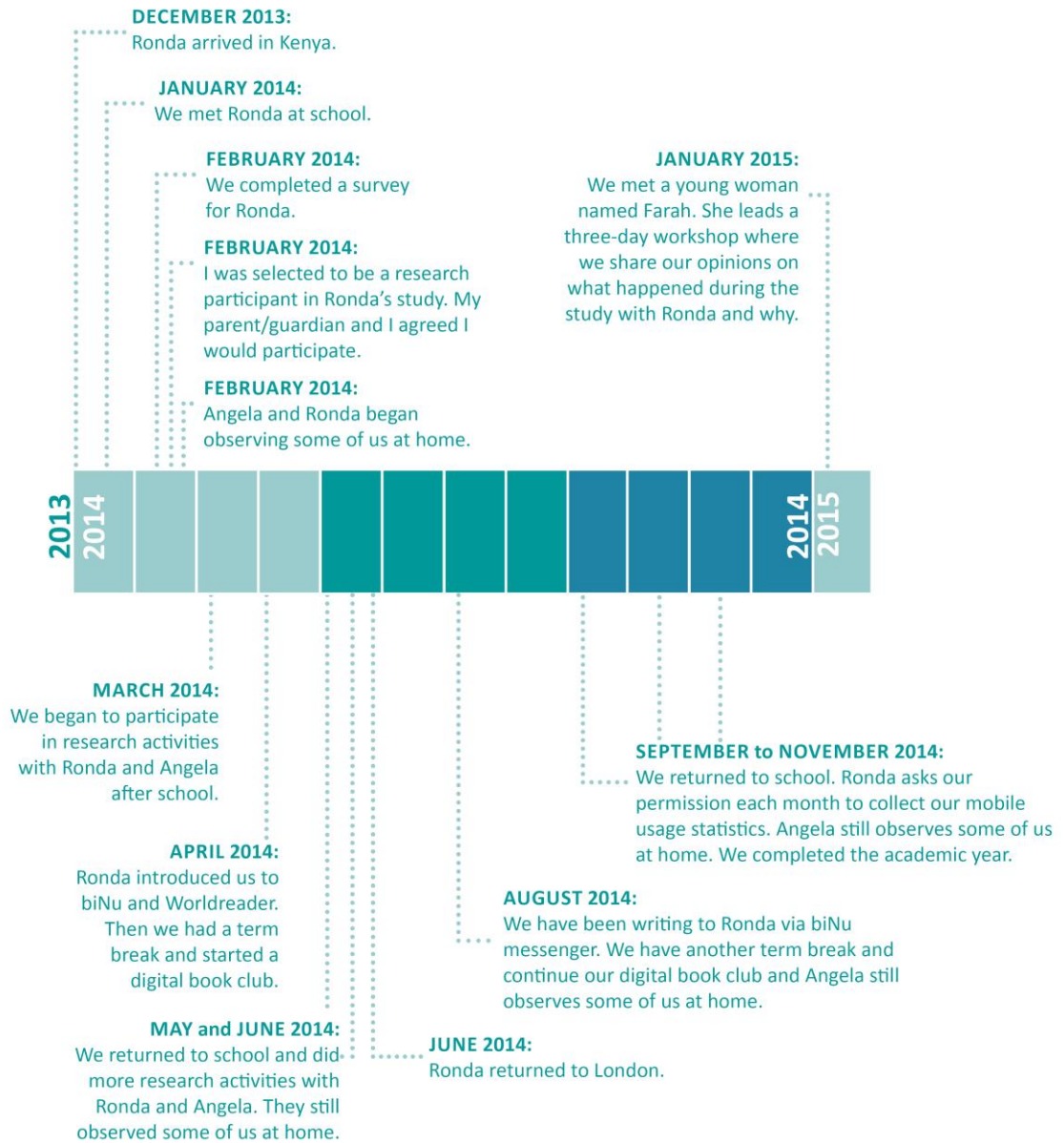


*Reimagined Choice Framework. Developed by the Author based on Kleine (2013)*

Once I reflected on actions taken and their impact, I used this information to make modifications, or new action strategies, when necessary to help the girls achieve their desired development outcome.

By the end of the study, I gathered the findings and presented them to the research participants for validation. A timeline of how the AR process might have been viewed from the perspective of a research participant can be seen in **Figure 5.2**.

**Figure 5.2**



*Research timeline from the perspective of a research participant (Author)*

There were three main research sites across which this education action research was implemented (see **Figure 5.3**):

1. The classroom at NDSS designated for my research use after school, the Home Science laboratory,
2. the routes taken on the journey home from school, and
3. the homes of the research participants.



**Figure 5.3**



*Acting across the three principal research sites (Author)*

Because the timeframe of these actions was grouped after school between 3:30-10:30pm on weekdays, implementing the action across these sites, particularly once the mobile component was introduced, could be done in a relatively seamless fashion: The research activities that occurred onsite at NDSS in the Home Science laboratory formed the bulk of the data collection, the journeys home from school with six girls built on the data gathered at NDSS, and the data collected remotely in the girls' homes, and through participant observation in the case of six girls, added still to the process. There were no real breaks in research implementation activity since, after the girls finished working with me in the Home Science laboratory and once they left NDSS, their app usage statistics were already being recorded.

The Pre-Intervention phase (please see again **Figure 5.1** above) is where I planned to further investigate the findings from the exploratory study by sketching the girls' after-school lives and the educational content available to them during this period. This phase also served as the baseline to find a starting point for action. The foundation built here led me into the Intervention phase, where cyclical reflexivity occurred as I circled from clarifying the research situations encountered, developing and implementing action strategies, evaluating these actions with the CF, before returning to clarify the situation again after the actions had been taken. The initial action strategy here was to introduce and help familiarize the 22 research participants with two mobile apps that might help them increase their access to educational content after school. Once this was done, based on what transpired, I knew I might need to consider other action strategies with an eye towards helping the girls realize their desired development outcome.

This brought me to the third and final AR phase, which was the fourth stage of the Altrichter, Posch, and Somekh (1993) “Stages of Action Research Processes” model. I changed the fourth stage of the authors’ model from making public the knowledge derived from this study to findings validation by the research participants. I did this because I believed that the penultimate word on whether this education action research intervention brought about the change in practice desired should integrate the learners’ perspectives. Now, I will detail the research methods used during each phase and the rationale behind their use.

#### 5.6.1. Sampling

The population that I asked permission to conduct research with was drawn from the NDSS student body. There were five characteristics that guided the sampling: schooling level, mobile ownership, classification as a day or boarding student, permissions from the girl, and permission from her parent or guardian.

To start, I conducted the research with girls in Form 2 and Form 3, the equivalent of being enrolled at the second and third years of secondary school. This was because Form 1 students were just making the transition to secondary school and participation in research activities during a time of great change would be onerous for them and ethically unacceptable. Similarly, girls in Form 4, the last year of secondary school, were preoccupied with life beyond NDSS and how they might perform best on the Kenya Certificate of Secondary Education (KCSE) exam. This meant it was an unreasonable time demand to ask for their research participation. Because Form 2 and 3 students faced similar challenges as their counterparts in Forms 1 and 4 with after-school access to educational content, I thought that girls in Forms 2 and 3 had a more stable routine which made their research participation more feasible and ethical.

In addition to specifying the research population based on their level of schooling, I utilized purposive sampling to further narrow the potential group of research participants. Maxwell (2008) suggests that purposive sampling as a research strategy helps researchers select “...particular settings, persons, or events [...] for the important information they can provide that cannot be gotten as well from other choices,” (p. 235). Due to the girls’ desired development outcome to have increased access to educational content after school, and my interest in exploring how mobile technology might facilitate achievement of that goal, I needed to identify girls in Forms 2 and 3 that owned a mobile phone. This is because, in the absence of ownership, I would have to provide mobile phones to the research participants. Because I did not want to introduce a factor to the research that might unduly influence the findings (a new-to-the-girls mobile phone would undoubtedly cause excitement, above average use, or even jealousy among girls who did not receive a mobile phone), I decided that girls who did not own a mobile phone could not be selected for this study. This decision has

ethical implications for this research, which will be discussed further in section 5.9. of this chapter.

Beyond their level of schooling and mobile ownership, being a day student was a requirement since NDSS students who boarded on-site (a total of 78 students when this study was implemented) would not be able to use their mobile phones on school grounds due to the policy banning students from doing so. Finally, I also needed to find girls who gave their permission to participate in the research, and to secure the permission of their parents or guardians. The girls selected needed to agree to participate in the research and were also given the option to quit the research at any time. Since most learners were under the legal consent age in Kenya (18 years old), parents have a right to be informed of what happens to their children and to grant access to them for research purposes (Morrow & Richards, 1996). Ultimately, 58 girls qualified for the study based on their schooling level, mobile ownership, and classification as a day student. This might have introduced a degree of bias to the study in that owning a phone and agreeing to participate may have meant that the girls were already hopeful about the potential of mobile to help them expand their choices for accessing educational content after school. I accepted this as one study limitation in the absence of other suitable ways for identifying participants.

In the end, of the 58 girls whom I asked whether they wanted to participate in the study, I secured permissions from 25 girls and their parents or guardians. By the study conclusion, 22 research participants completed the entire 13-month study; one dropped out due to language barriers (a girl from Somalia whom we could not communicate with in Swahili) and two others were unable to participate once the Pre-Intervention phase got underway due to months-long absences because they were unable to pay their school fees. The list of pseudonyms for the final research participants, including demographic data such as their level of schooling, age, ethnicity, and mobile phone type owned can be found in **Appendix A**, and the letter to request the girls’ parent or guardian permission for study participation can be found in **Appendix B**.

### 5.6.2. Pre-Intervention Phase

**Table 5-2**

Action Research Phase	Duration	Methods
Phase 1 Pre-Intervention	December 2013 to the final week of March 2014 (four months)	<ul style="list-style-type: none"> <li>Participant observation</li> <li>Research diary</li> <li>Structured interviews</li> <li>Focus group discussions</li> <li>Survey</li> </ul>

*Pre-Intervention Phase (Author)*

### *5.6.2.1. Participant Observation*

As a qualitative research method, participant observation, or observation more broadly, has been used by researchers to gather data about people and their practices (Baker, 2006). Contextualizing participant observation as a tool of human geographers, Jackson (1983) imagines that the act of participant observation should never be performed in isolation but with other research methods that will help build a more complete picture of the phenomenon being studied. In this investigation, participant observation during the Pre-Intervention phase was performed to examine how after-school hours were structured for some research participants. The observations were undertaken on the journey home from school and in the girls' homes, guided by an observation chart (see **Appendix C**).

Direct observations were conducted with six of the 22 research participants between February and October 2014, spanning much of the action research period from December 2013 to January 2015. The girls were selected for after-school observations based on the following three factors:

1. their consent being obtained along with their parent or guardians;
2. mode of transport (with a preference for travel by foot since this would mean their home was relatively near NDSS); and
3. the ability to maintain safety during the journey and once at the girl's home.

The six girls selected met all the criteria above. Factors two and three were important because if a girl journeyed home as a vehicle passenger, it was likely that she lived in a location where it would be difficult for me to return to my own place of residence once the observations were concluded. Most of the NDSS school population lived in historically deprived areas characterized by poverty and crime (see **Chapter 4** for further reference). Therefore, it was necessary to ensure that the location of a girl's home was one where, as an easy-to-identify female foreigner, there would be a reasonable expectation of safety, particularly since the direct observations would be implemented after school when it would be darker outside. However, I acknowledge that these selection criteria may have resulted in the unavoidable possibility of selection bias because I did not track girls who lived far away from NDSS. Moreover, due to time constraints for conducting this study, I had to limit the after-school participant observations to six of the 22 research participants (just over a quarter of all participants). This would help me achieve more depth in the data collected after school in their homes as opposed to trying to conduct participant observations with all 22 girls: A total of three, week-long after-school participant observations were conducted with the six girls, amounting to 15 days of observation for each girl.

Angela was the lead researcher for several of the after-school participant observations sessions, and I led data collection for six of these sessions. The reason Angela led most of the

observation sessions was so that I could gain insight into the girls' after-school routines that might not be affected by the girls acting differently because a foreigner was present in their home. Because Angela was a recent NDSS graduate well-known to the research population, different behavior in her presence was likely to be minimized, although this could not be guaranteed.

#### *5.6.2.2. Research Diary*

My research diary emerged to be a crucial part of the ongoing reflexivity that both informed and guided this research. I decided to use a research diary to note both my reflections and perspectives on the research process since diaries can be directly linked to other data collected during the investigation (Alaszewski, 2006). Research diaries can also be used to note miscellaneous occurrences, to help the researcher recall activities when away from the research context, and can facilitate organization of the researcher's thoughts as the research journey unfolds (Altrichter & Holly, 2005). In my case, I also used the research diary to note connections to the CF I observed as they emerged in situ.

#### *5.6.2.3. Semi-structured Interviews*

Based on findings from the exploratory study, and through use of the CF to map the research context, I broadly knew the areas I wanted to examine with the NDSS community by the time the action research process commenced. Topics included the girls' after-school schedules, things they did at home to learn, and their desired educational outcomes. Nevertheless, it was important to give the girls space to share their experiences beyond what I had envisioned. Consequently, I took the decision to use semi-structured interviews (see **Appendix D** for the Pre-Intervention phase interview guide and **Appendix E** for the Intervention phase interview guide) to help promote flexibility in the topics discussed and to increase my opportunities to learn from them through listening (Barbour & Schostak, 2005). The weakness of this research method is that it took more time than following a structured interview schedule. Employing semi-structured interviews was also a challenge because my time in the field was limited and asking the girls for part of the small amount of free time they had after school was not always easy. Nevertheless, I decided to use this method because it would likely yield richer data and remains in line with the facilitation of people-centered research by providing girls with space to explore their perspectives more fully.

#### *5.6.2.4. Focus Group Discussions*

Focus group discussions (FGDs) have previously been used as research tools with Kenyan children to facilitate peer interaction, which can lead to participants sharing attitudes on a variety of topics (G. K. Barker & Rich, 1992). This is possible in part because of the comfort children can feel being with people they know. Additionally, hearing others' ideas can sometimes inspire them to share ideas based on their own experiences or challenge ideas they

disagree with. FGDs are also a relevant tool for research with African girls since the organization and implementation of the discussion can be designed to be non-hierarchical, enabling exploration of individual experiences, which may sometimes have collective overlap, in a non-competitive and non-threatening manner. Morgan (1996) further states that FGDs can be used in combination with other research methods, making it possible to join the discussions with the other methods used in this investigation. Focus groups can enable social contexts to be considered in discussions, and as an action research tool can also promote consciousness-raising about issues, including education, that affect the girls' ability to lead the lives that they have reason to value (Wilkinson, 1999). The FGD guides used in the Pre-Intervention and Intervention Phases, respectively, can be found in **Appendices F and G**.

#### *5.6.2.5. Survey*

De Vaus (2002) defines the survey as a social science research tool to support data collection from different research participants on the same variables, in a systematic manner, for the purposes of comparing cases. The use of surveys in each action research phase of this study was done for two reasons:

1. I wanted to generate data that could highlight differences and similarities among the girls surveyed, and could be rendered in a quantitative fashion.
2. I wanted to systematically capture changes in access to educational content after school, and the factors that positively and negatively influence this access<sup>13</sup>.

The survey included closed and open-ended questions, as well as a few scaled items. **Appendices H and I** show the survey instruments for the Pre-Intervention and Intervention and Evaluation phases, respectively.

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<sup>13</sup> Though, admittedly this could also be achieved through qualitative methods employed during the study, this provided a further source of triangulation.

### 5.6.3. Intervention Phase

**Table 5-3**

Action Research Phase	Duration	Methods
Phase 2 Intervention	April 2014 to first week of December 2014 (eight months)	<ul style="list-style-type: none"> <li>• Participant observation</li> <li>• Research diary</li> <li>• Ranking and association game</li> <li>• Focus group discussions</li> <li>• Structured interviews</li> <li>• Card game</li> <li>• Survey</li> <li>• Remote participant observation by mobile</li> <li>• App usage statistics</li> </ul>

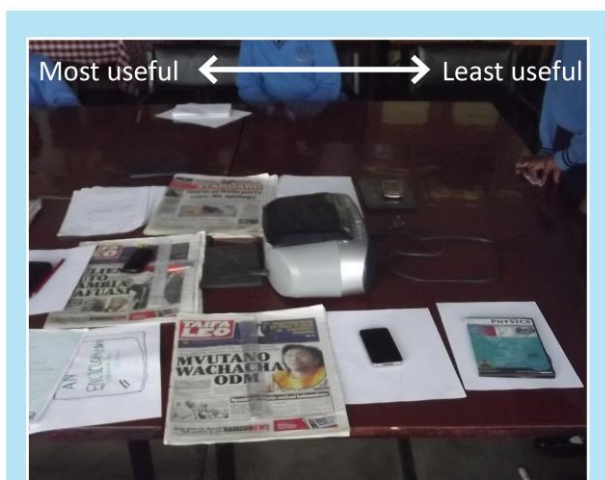
*Intervention Phase (Author)*

The Intervention phase is where the principal action strategy, introducing the girls to two mobile apps which might increase their access to educational content after school, was implemented. But before this was done, I conducted a ranking and association activity to understand which tools the girls used for learning after school and where this use took place.

#### 5.6.3.1. Ranking and association

The ranking and association (R&A) activity is modeled on the one performed by Biggeri, Bonfanti and Conradie (2008) in their work with children in India to critically investigate the human development dimension of well-being. This activity asked the girls to rank and organize into groups drawings of places they learn during after-school hours and the tools (the physical objects were made available) that they employed for learning after school (see **Plate 5.1**).

**Plate 5.1**



*Example of a ranking and association arrangement from the first week of April 2014, before mobile apps were introduced (Author)*

Rankings and associations were performed in terms of the girls' favorite places to learn after school, the tools they used during this period, and the perceived utility of the tools with respect to realizing their desired development outcome to have choice to increase their access to educational content. To do this, I shared drawings that Angela and I made of all the places the girls might learn after school, and provided them with the tools they might use, too. The rest of the R&A activity was implemented as follows:

1. Next, I asked the girls to arrange the tools by where they used them most to learn after school each day.
2. Subsequently, I asked the girls to rank the tools from the tool they used most to learn after school to the tool they used least.
3. Following that, I asked the girls to rank the locations from being the easiest place for them to learn after school to the most difficult place.
4. Then, I asked the girls to rank the tools from being the most useful to them to the least useful for learning during after-school hours.
5. Finally, I asked the girls which tool they would like to use more for learning after school and why, and they had to limit their responses to just one tool. I also asked them where they would like to learn more after school and why, again limiting their responses to just one place.

After these R&A arrangements were made and noted, we then had a group discussion about the arrangements, guided by notes I took during the exercise. The complete procedure for the R&A activity can be found in **Appendix J**.

This visual and tactile research method provided the learners with a means of expression different to the written and oral responses they had been giving during the Pre-Intervention phase. This activity was repeated three times during the AR process to gauge if there were any changes in the rankings and associations made, and exploring the reasons for these changes.

#### *5.6.3.2. Card Game*

The card game research method was also adopted from Biggeri, Bofanti and Conradie (2008)'s capabilities-based research with children in India. Additionally, I drew inspiration to create this innovative research method from activities Biggeri and Anich (2009) employed while conducting a capabilities-based study with street children in Uganda. Card games have been used as a prompt in group research to help people discuss topics related to an investigation (Kitzinger, 1994). The cards serve as a mechanism to help take focus away from the researcher and to place it firmly on the participants and their discussions, in addition to encouraging those normally quiet to speak (*ibid.*). Robinson (1999) found that use of card games as a research method can facilitate exploration of "...assumptions, sources of knowledge and areas of apparent misinformation," (p. 907). Card games have also been used by other researchers



who have applied the CA in their research, including for program impact assesment (Frediani, 2007).

I used the card game as a way to operationalize the concept of the girls' resource portfolio. This was an attempt to understand how the resources available to them – or lack thereof – affected their education and their educational outcomes. To do this, Angela and I drew 11 resource cards based on the resources that Kleine (2013) suggests constitute the basis of a person's agency (see **Plate 5.2** for one example of a resource card depiction).

**Plate 5.2**



*The financial resources card used in the card game (Author)*

I then took these 11 cards and showed them to three members of the NDSS faculty to see if they thought the drawings represented the resources portrayed. Where resource depictions were unclear, I asked the faculty members for suggestions on how they could be improved. For example, in the financial resources card above, while the ICT teacher Ms. Wabuge thought the drawing was accurate, she suggested that I add M-PESA to symbolize digital financial resources commonly used in Kenya. Once the resource cards were finalized, I tested their conveyed meanings one last time with Charlotte, a recently graduated NDSS student who was employed as the school librarian, and undertook the same feedback solicitation process for each resource card.

Once the 11 cards were ready, in groups of five or six, I showed the girls each of the resources and asked what they thought their meanings were. Once the correct meanings were established, I then asked the girls if they thought any of the resources did not affect their education or their educational outcomes; for those that were thought not to have an effect, the cards were removed for the rest of the activity with the group. Next, I asked the girls to tell me the resource or resources they felt affected their education the most, whether positively or negatively. The girls then arranged the most important resource cards (in their opinion) in front of them. We then discussed the resource cards selected, whether the effect the resource had

on their education was positive or negative, and the reasons why they thought the resources had the effects that they did.

The overall aim for this new research method was to build a discussion around their resource-based agency and how, if at all, their resources affected their education and their pursuit of any desired development outcomes. The depictions developed for all 11 resource cards can be found in **Appendix K**.

#### *5.6.3.2.1. Mobile Data Collection: Remote participant observation and app usage statistics*

In this study, two mobile applications named biNu and Worldreader were deployed as research tools to help the NDSS learners have choice to increase their access to educational content after school. The decision to employ these two apps was made after considering the following factors:

1. The mobile phone type(s) available to the learner (basic phone, feature phone, and smartphones<sup>14</sup> were all owned by the 22 research participants).
2. The costs involved with using a proposed tool.
3. The content offered by a proposed tool.

The identification of Worldreader and biNu was made possible through a search for all the mobile learning or reading applications available in Kenya at the time of the study. During the search, the following questions were considered: Does the app need the internet to work? Which handset does it work on? To which age group is the intervention targeted? What is the underlying learning theory used in the app? Which topics are covered in the app? How much does the app cost? Does the app support peer learning or collaboration? Does the app make learning analytics accessible? Does the app have learning activities and resources integrated into it? In **Table 5-4**, the output of this search is shown.

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<sup>14</sup> Basic phones can only make and receive calls and texts. Feature phones have basic internet functionality, can download apps formatted for this phone type, and can use mobile data to perform more sophisticated operations but its appearance is like a basic phone. Smartphones are the most advanced type of phone and can be used to download more complex apps and has much more sophisticated functionality than a feature phone.

**Table 5-4**

Tool (below) Features (right)	Need Internet?	Hardware it works on?	Age group aimed at?	Underlying learning theory?	Topic aimed at?	Cost	Support peer learning or collaboration?	Equipped w/learning analytics?	Come with learning activities and resources?
<b>1. Eneza Education</b>	No for some but yes for other versions	Basic phones, smartphones and computers	Primary school	Behaviorism but also aspects are constructivist (competitive quizzes, ability to interact with teachers)	Exam prep across all subjects at the secondary level	Can be free to students if schools pay costs. Otherwise, it is 50 cents per SMS	Yes, via quizzes	Yes	"Spreading Stories," includes paper booklets of stories that students can take comprehension quizzes on via the mobile phone.
<b>2. Materials from KICD</b>	Uncertain	Basic phones, smartphones	Primary and secondary	Behaviorism	Content available across all subjects	Free at the moment	Unknown	Unknown	Yes, especially since it's tied to the national curriculum
<b>3. MXit</b>	Yes	Feature phones, smartphones, computers	All	None, but has constructivist possibilities	Not specifically learning-oriented, but Dr Math in South Africa has been used for that subject	Free	Yes, that's the very nature of the platform	No	No
<b>4. Facebook Zero</b>	Yes	Feature phones	All	None, but has constructivist possibilities	Not specifically learning-oriented	Free	Yes, that's the very nature of the platform	No	No
<b>5. Wikipedia Zero</b>	No for some but yes for other versions	Basic phones, feature phones, computers	All	Users can generate knowledge and rate knowledge others share.	Content available across all subjects	Free for the countries where zero-rated data agreements exist	Yes	No	No

Tool (below) Features (right)	Need Internet?	Hardware it works on?	Age group aimed at?	Underlying learning theory?	Topic aimed at?	Cost	Support peer learning or collaboration?	Equipped w/learning analytics?	Come with learning activities and resources?
<b>6. biNu</b>	Yes	Feature phones	All	None, but has constructivist possibilities	Content available across all subjects	Free, but must pay data charges. However, compression software helps reduce this cost	Yes it is possible but not inherent in the software itself	Yes	No
<b>7. Kytabu</b>	Yes	Tablets	All	Behaviorist	Content available across all subjects	80KES/week	No	No	No
<b>8. Worldreader</b>	Yes	Feature phones or eReaders	All	None, but has constructivist possibilities since users can create content	Content available across all subjects	Free, but must pay data charges. However, compression software helps reduce this cost	Yes it is possible but not inherent in the software itself	No, but if agreement is made with the company, I could get access for my users	No
<b>9. Ustad Mobile</b>	No	Feature phones and smartphones	All	Based on the design implemented, both behaviourist and constructivist practices are possible	Any that the user wants since they can choose the content that is populated	Free	Yes	Yes	Yes, these can be designed within the platform
<b>10. eLimu</b>	No	Tablets	Primary school	Both behaviourist and constructivist practices are possible	Content available across all subjects	Free at the moment	Yes	Unknown	Yes

*Matrix of mobile learning tools available in Kenya in 2013 (Author)*

On all three criteria outlined earlier, biNu and Worldreader were the most ideal technical tools to introduce because the apps were accessible on the phone types the girls had, the cost to use these apps was low relative to the financial resources the girls had available, and the content the apps made available was educational in nature and relevant for students in secondary school. More information on the selection of biNu and Worldreader as the

proposed tools to support IATECAS can be found in **Appendix L** and screenshots of the apps can be found in **Appendix M**.

biNu and Worldreader offered two major pathways for data collection: Observation of user activity on biNu that is public and freely available to other users and the backend app usage statistics. Some of the activities that can be observed publicly include direct messages sent to me by the girls, automated status updates shared on the public “wall” for the app that inform others about the books a girl is presently reading, and “wall” exchanges with other people a girl is connected to on the biNu social media network. If a research participant has a biNu user ID, it is possible to access her user logs, which include insightful data points such as time spent using biNu apps, the books she has browsed, for how long she has read a book, and whether an m-book she accessed has been read “cover to cover.”

Each research participant created her own biNu user ID, and the girl and her parent or guardian both granted their permissions for their daughter’s usage statistics data to be collected between April and December 2014; permissions were sought and secured at monthly intervals so that the girls had a mechanism to opt out of having their data collected. The app backend data was collated by biNu on request from the Worldreader team in May 2014, July 2014, December 2014; biNu usernames submitted to these entities were anonymized through utilization of pseudonyms to protect the girls’ identities. Worldreader agreed to support this part of the data collection process since few formal academic studies had been conducted on usage of their app, and they were curious to learn what the findings of my research would be.

In June 2014, two and a half months after biNu and Worldreader were introduced, I departed the field to enable a period of remote data collection. With the girls’ consent, I continued remote participant observation by documenting the activity from the research participants that was publicly available online and shared with me directly through biNu messages. This mobile data collection enabled me to gather logs which contained quantitative data in the form of independent user statistics that provided an objective perspective on whether the introduction of the two apps had an impact on the goal to increase access to educational content after school among the research population. As mentioned earlier, in ICT4E data of actual app usage is a rarity (Trucano, 2005).

The repeated and rolling data collection during the Intervention phase served to alert me to the need to adjust my principal action strategy in a manner that would help the girls achieve their desired development outcome. For example, in the first month after the apps had been introduced, I noticed that usage was high, particularly around reading the books we had agreed to read together during the term break. This prompted me to ask the girls if they valued this activity (participating in a digital book club discussion), and because they did, it became an activity that was integrated during the remaining two term breaks of the academic

year. This flexibility to adjust my action strategies when necessary or useful was another benefit of applying an AR approach with the CA as the normative framework.

#### 5.6.4. Evaluation Phase

**Table 5-5**

Action Research Phase	Duration	Methods
Phase 3 Evaluation	December 2014 to January 2015 (one month)	<ul style="list-style-type: none"> <li>• Participatory learning workshops</li> <li>• Ranking and association game</li> <li>• Survey</li> <li>• App usage statistics</li> </ul>

*Evaluation Phase (Author)*

##### 5.6.4.1. Participatory learning workshops

Participatory Learning and Action (PLA) is an evaluation approach that views participation as both a means and an end to development (Pretty, Guijt, Thompson, & Scoones, 1995). Speaking to the PLA paradigm, Pretty (1995) states that: “Participation calls for collective analysis,” (p. 1254). Wetmore and Theron (1998) go further to position PLA as “...a creative approach to information sharing and learning, and that it challenges prevailing preconceptions about resource-poor people’s knowledge of their own reality,” (p. 31). With PLA, my goal was to complement the AR epistemology by promoting shared knowledge and interactive learning. I used the participatory learning workshops to validate the 12 findings I thought emerged from the data by inviting the girls to openly critique these findings. These findings, along with the instructions sheets for the PLA workshop activities, can be found in **Appendices N, O, and P**. However, I will provide here a summary of what comprised the PLA workshops.

The PLA workshop activities were designed to be standalone yet complementary to each other; all shared the goal of enabling the girls to evaluate their experiences as research participants and to (in)validate the findings that I identified during the 13-month study. The workshops occurred during the final week of January 2015 in the after-school hours between 3:30 and 5:30pm. Three activities were implemented: Lessons Learned, Represent Yourself! and Mini Interviews, and Letter Writing. The three PLA workshop activities were conducted with 18 of the research participants; one girl did not complete any activities because she transferred schools during the previous academic year. Three other girls participated in the Lessons Learned and Represent Yourself! and Mini Interviews activities but not the Letter Writing because they were absent from school the day the activity was conducted.

The **Lessons Learned** workshop activity began with the girls being asked to share their favorite memories from the past year’s research experience as a warm up exercise. Then, they

worked in groups to create a timeline of the activities during the 2014 academic year to illustrate the events as they recalled them. This would provide data useful to understanding how they experienced their research participation while helping to jog their memories about what occurred as the research impact was reviewed. From there, the girls provided feedback on what research aspects worked well and which could be improved, and explained the reasons behind answers given. Photos were taken of the timeline and the girls kept the physical copy.

**Represent Yourself! and Mini Interviews** were the main activities through which I sought to (in)validate the 12 research findings identified. The activity commenced by asking the girls their goals for the 2015 academic year, like what had been done when the AR process was launched. Then, the 12 findings were presented to the girls and in an open group discussion they could challenge, agree, or modify them as they chose. They were also given the opportunity to add findings that I had not mentioned. The girls were then individually asked questions about their experience with biNu and Worldreader as they attempted to realize choice to IATECAS. The questions I posed again drew from the Choice Framework in their formulation to address the one main and six subsidiary research questions (please see section 5.4.). Notes were taken during the discussions and semi-structured interviews.

The concluding PLA workshop activity was the **Letter Writing**. Here, the girls were asked to write a letter to the creators of biNu and Worldreader to express their opinions about the apps. They were encouraged to discuss both the positive and negative feedback they had, and to suggest improvements that might better support their ability to realize choice to IATECAS. These letters were scanned and then returned to the girls.

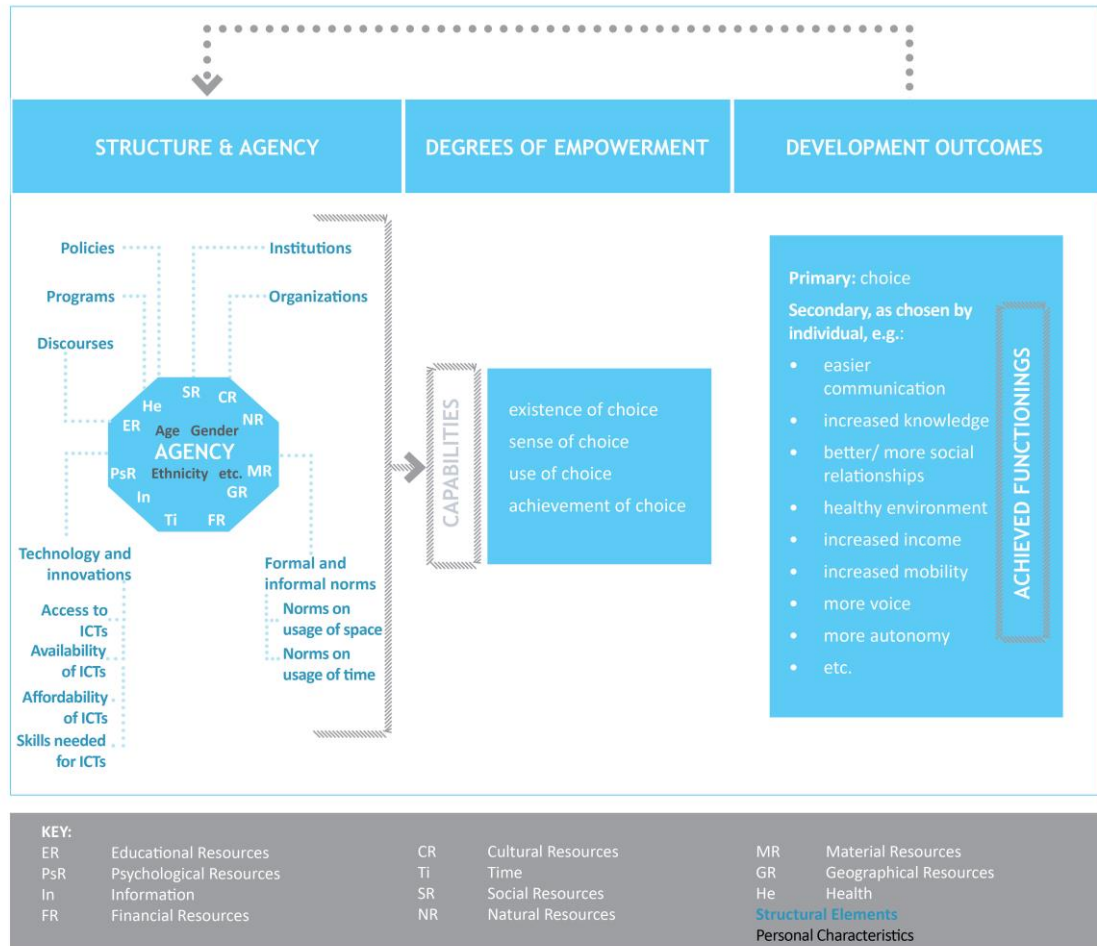
For the PLA workshops to evaluate the overall study findings, I engaged a third researcher, Farah. Having Farah lead these activities was done to minimize the likelihood that the participants would feel pressured to say what they think I or Angela wanted to hear. This was a concern because the girls had been working in partnership with me and Angela to conduct the research for a long time, and might have felt obligated to agree with what I said or to only provide positive feedback. Overall, Farah's addition to the research team was meant to increase the validity of the findings because although she was acting on my behalf, she was still largely viewed by the girls as a third party unrelated to the main research process (Liggett et al, 1994). In fact, the girls challenged and modified four research findings presented, and provided negative feedback and dislikes about biNu and Worldreader in their letters.

With the research methods presented, in the remaining sections of this chapter, I will explain how I undertook the process of data analysis before engaging with issues related to positionality, ethics, and the study limitations.

## 5.7. Data Analysis – Applying the Choice Framework

In Chapter 3 (please see **section 3.5.**), I discussed the rationale behind the decision to utilize the CF (Kleine, 2013) (see **Figure 5.4**) to operationalize the CA.

**Figure 5.4**



*Reimagined Choice Framework. Developed by the Author based on Kleine (2013)*

I also surveyed how the CF has been adopted as a practical and theoretical tool before highlighting how the CF would be used throughout this thesis. Here, I will explain how the Choice Framework was applied as a tool for data analysis to surface the complexities that constitute the research findings. I will begin by describing how the data was distilled from various research methods. Then, I will discuss the procedure followed for applying the CF to this data to arrive at the main research findings. Finally, I will make clear how the CF provided a people-centered lens with which to process the data and findings, and to uncover the three themes that guided the chapters of analysis. An example of how thematic coding was applied during the data analysis process and using the CF can be found in **Appendix Q**.

The mixed methods study design and use of multiple research methods yielded a significant amount of data to be processed (see **Table 5-6**).

**Table 5-6**

<b>Research Phase</b>	<b>Data Type Collected</b>	<b>Form of Data Collected</b>	<b>Quantity of Data Output Generated</b>
<b>Participant observation</b>	Qualitative	Observation chart notes	24 observation charts covering six research participants after-school hours between February and October 2014
<b>Research diary</b>	Qualitative	Diary entries	95 entries spanning six months
<b>Semi-structured interviews</b>	Qualitative	Interview transcripts and notes taken during interviews	44 interview transcripts, approximately 20 minutes of talk time each
<b>Focus group discussion</b>	Qualitative	Discussion transcripts and notes taken during focus group discussions	12 focus group discussion transcripts, approximately 1.5 hours each
<b>Survey</b>	Qualitative, Quantitative	Numerical and short answer survey responses	22 surveys with 30 data points, and 44 surveys with 17 data points each across two research phases
<b>Ranking and association game</b>	Qualitative, Quantitative	Rankings quantified as activity is repeated over time and transcripts of statements explaining rankings	Six groups with three rounds each of ranking and associations conducted with 16 after-school tools, seven places, and whole group discussions
<b>Card game</b>	Qualitative	Transcripts of card game discussions	Six groups of card games with transcripts of approximately one hour of conversation per group
<b>Participant observation by mobile</b>	Qualitative	Notes taken of online interactions and documentation of learners' time and day of appearance online	Six months of notes taken of remote observations of mobile activity on biNu and Worldreader conducted five days a week for 22 girls
<b>App usage statistics</b>	Quantitative	Numerical statistics related to multiple aspects of biNu and Worldreader usage	240 days across eight months of daily app usage statistics for two apps and 22 girls
<b>Participatory learning workshops</b>	Qualitative	Notes taken on responses given during workshops, copies of timelines made, copies of letters written	Three days of notes from three 1.5-hour long workshops, one timeline, 18 letters to app creators

*Amount and type of data collected and processed during 13-month AR process (Author)*



Furthermore, the process of implementing action research requires ongoing reflection on actions taken, and adjusting action strategies to help produce desired changes when necessary. Because of this, the data analysis process began as soon as fieldwork commenced. To start, the research diary was used to note interesting events, people, and my own reflections. This data collection method became a useful reference point for providing background information on the data drawn from other activities. Data generated through the research diary was critically reviewed and annotated while I was in the field from December 2013 to June 2014. Doing so was particularly helpful with documenting various cultural nuances which might explain some of the structural barriers in place before and after Intervention phase, and provided support in answering the SRQs.

During the Pre-Intervention phase, survey data refinement was initiated by first sorting and removing the surveys of girls who indicated that they did not own their own mobile phone and/or were learners who boarded at NDSS<sup>15</sup>. Following this, I took the handwritten responses and entered them into a Microsoft Excel spreadsheet for each learner who still qualified for study participation. Once permissions to participate in the research had been gained from the 22 girls and their parents or guardians, I then ring-fenced their survey data and created a new spreadsheet with just their survey responses. Then, I used this data to create individual research participant profiles to identify similarities and/or differences in their after-school schedules, learning tools used, and existing access levels to their mobile phone.

Next, survey data which showed how the girls spent the after-school hours was compared to data collected through participant observations undertaken with six of the 22 research participants (please see **sub-section 5.6.2.1.** for a review of how the six girls were selected for this research method). This was done to triangulate the accuracy with which the girls recounted their 'typical' after-school schedule as well as to note things that may have been observed first-hand that were not mentioned in the surveys. The data documented in the participant observation charts included information to help build a thick description of the environs in which these six girls lived. I distilled this data by drawing the paths the girls took on their journeys home from school and what their homes looked like, including depictions of the people who had a presence in their lives away from school. The FGDs and semi-structured interviews were subsequently transcribed and analyzed.

With the Pre-Intervention phase data distilled, I applied the CF once more by searching for and highlighting components of the tool that appeared in the data from two areas: capabilities (both structural elements and resource-based agency) and the degrees of

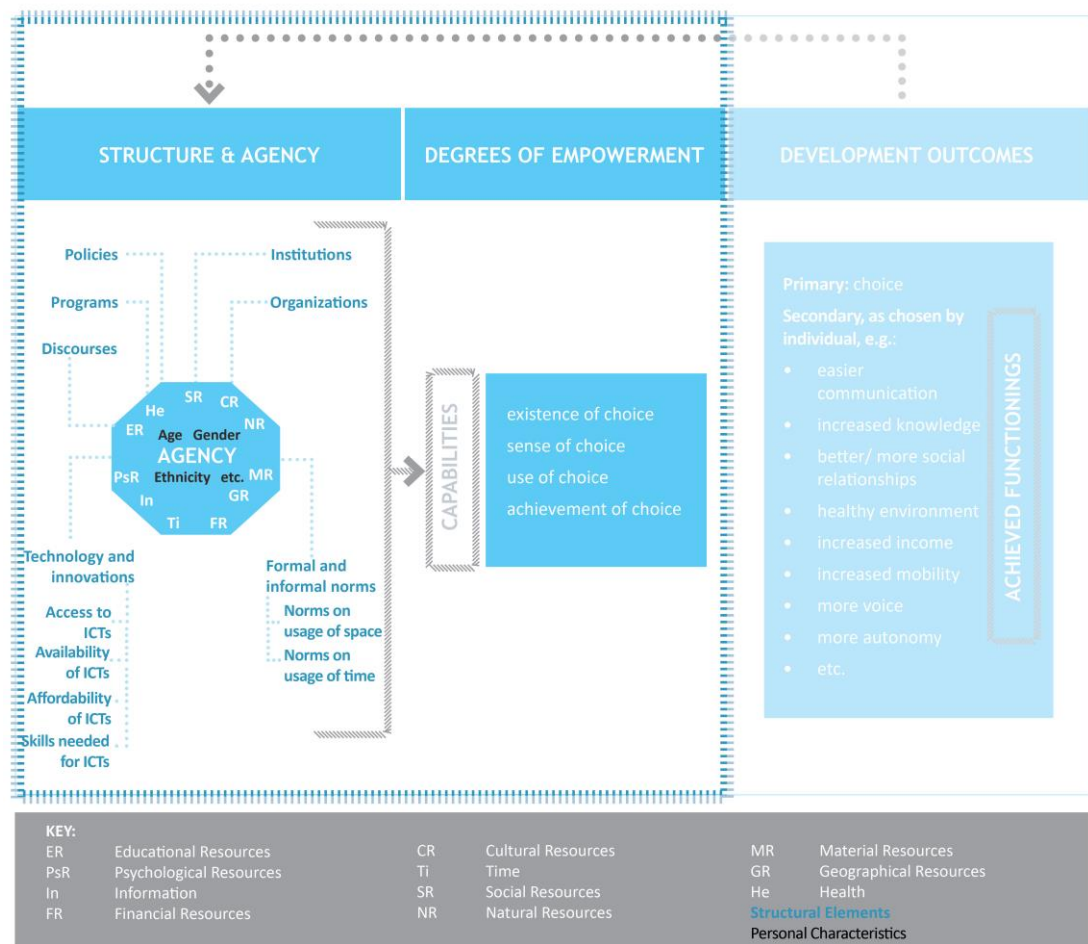
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<sup>15</sup> It was necessary to collect this data in the absence of any other efficient mechanism for gaining knowledge about the girls' individual personal characteristics.

empowerment. To do this in a systematic manner, I wrote down the 20 different elements that comprise these two areas of the CF (see **Figure 5.5**):

- |                   |                             |                            |
|-------------------|-----------------------------|----------------------------|
| 1. Institutions   | 9. Innovations              | 15. Time                   |
| 2. Organizations  | 10. Educational resources   | 16. Social resources       |
| 3. Discourses     | 11. Psychological resources | 17. Natural resources      |
| 4. Policies       | 12. Information             | 18. Material resources     |
| 5. Programs       | 13. Financial resources     | 19. Geographical resources |
| 6. Formal norms   | 14. Cultural resources      | 20. Health                 |
| 7. Informal norms |                             |                            |
| 8. Technologies   |                             |                            |

**Figure 5.5**



*Reimagined Choice Framework, structure and agency, and degrees of empowerment highlighted. Developed by the Author based on Kleine (2013).*

Then, I reviewed the data across the five research methods deployed during the Pre-Intervention phase, drawing on the conceptual coding of the CF to further distill the data points and their significance. For one example of this process, with the survey, I circled responses where the girls shared constraints in their ability to access their mobile phone

(technologies and innovations structural barrier to a material resource), and thought about why these constraints were in place (informal norms), drawing on data from other research methods implemented. I also considered the amount of time (time as a resource) the girls stated they had available to study after school each day. After the CF was applied to the data in this way, I noted links between structural and resource-based agency elements, as well as any recurring patterns, before taking this information and exploring how it might impact the study findings. In this way, the Pre-Intervention phase began to offer insight into potential overarching themes of this study.

Once the data generated in the Pre-Intervention phase had been analyzed, I then modified the research design for the Intervention phase based on these insights. The Intervention phase initiated three additional research methods, and the collection of mobile app usage statistics with the introduction of biNu and Worldreader. The data for the R&A activity was documented as it unfolded, with notes made at the end of each session about what was discussed. Data distillation for the card game followed identical steps as the R&A activity.

After initial consent was gained from the girls and their parents or guardians (and each month thereafter), I accessed the research participants' app usage statistics with the help of the technical teams at biNu and Worldreader. I was sent a link that had amassed the data for the 22 girls in my study. This data captured information such as the name of the books read, time spent reading books and the days when this reading occurred, and the amount of time spent on biNu using apps like Wikipedia and an exam preparation tool called beSmart. All data was downloadable into a Microsoft Excel spreadsheet with headings already programmed for the data items collected.

Much like the Pre-Intervention phase, I took each of the 20 elements of two areas of the CF to methodically code the qualitative data generated. For the quantitative data generated by the mobile apps, three degrees of empowerment in the CF were primarily considered: existence, use, and achievement of choice. The sense of choice was discerned through the R&A activity as well as comments made during FGDs. Using mobile app data from the nearly nine months it was collected, it was possible to infer if the girls experienced existence of choice (the choice being available to the individual), use of choice (using the choice available; in this study, the biNu and Worldreader apps were the choice made available). The choice existed once the two mobile apps were introduced; the use of choice could be assessed once I observed in the statistics if, how much, and which areas of the apps were used. To derive further meaning from this data, particularly around the achievement of choice (if after the Intervention phase they had more choice in accessing educational content after school compared to the Pre-Intervention phase), it was necessary

to pivot between deductive and inductive approaches to layer insights from the qualitative research methods to act as explanatory mechanisms for trends seen in the quantitative data.

Through these analyses, and with the (in)validation of the findings during the PLA workshops, three major study themes emerged: a) time, a) mobility, and c) two personal characteristics which significantly shaped the structural elements the girls navigated and the resource-based agency they had available to draw on during this study: age and gender.

### 5.8. Positionality: The Researcher's Place and Power in the AR Process

I was motivated to conduct this research because of my own educational experiences: Although I am from what is considered to be one of the most income-rich countries in the world, the United States (U.S.) is home to much socio-economic inequality as well (Murtin & Mira d'Ercole, 2015). As a girl child of African and Native American ancestry, I was born into a low-income household that received government assistance. During high school,<sup>16</sup> my time after school was punctuated by constraints due to norms which required me to perform substantial care work in the home, paid work outside of the home, as well as to manage emotionally challenging domestic issues stemming from drug sales, drug use, and teen pregnancy among my family members. Additionally, I grappled with access to books beyond what was provided for free through my secondary school institution because only one parent in my household had stable, paid employment. The parallels between my girlhood experiences and those lived by NDSS students underscore the ongoing challenges in education delivery for girls across both Global North and Global South contexts.

While I developed a friendship with Julie during my Master's research which continued once I returned to London and throughout this doctoral work, and although I was friendly with the faculty, staff, and students at NDSS, it was clear that I was an outsider conducting research in a context different from my own – I just happened to be black like the people I was working with. While I initially felt that my identity as a black woman would lessen the distance between myself and the girl research participants, this rapport was not something automatic and required concerted effort on my part: I shared skin color and gender with them, but not nationality, cultural heritage, or above all age. This reality formed part of the continuous engagement with and reflection on my positionality, particularly how I was situated (place) and my influence (power) in and on the research context (Finlay, 2002). This self-reflection was critical to conducting research with what might be considered a vulnerable population, secondary school girls from low-income areas of Nairobi. I will now highlight some of the ways in which my positionality as a

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<sup>16</sup> The U.S. equivalent of secondary education.

researcher shaped this education AR process with respect to place and power, using a vignette from the study period to frame the discussion.

Occasionally during the academic year, NDSS teachers who were unaware of the compensatory arrangements I had made with the research participants questioned me about how the girls would benefit from my research (see **sub-section 5.9.1.** later in this chapter for details of what was provided). The questions, while not posed in an accusatory or aggressive manner, still assumed much about my motivations and background as a researcher. This questioning is common when acting in the capacity of an outsider, cultural or otherwise, in a research context (Griffith, 1998; McKinley Brayboy & Deyhle, 2002). Furthermore, because there has been a long history of Western researchers conducting studies in developing contexts, and local oversight of foreign researchers is often minimal if not non-existent (Leach, 2010), my experience being interrogated was viewed as a form of due diligence on the part of adults who likely felt a responsibility to protect 'their' girl children.

Sharing experiences of my girlhood, which in many ways mirrored some of the circumstances of the research participants, was not very helpful in my attempts to assuage the teachers' concerns because the perceived-to-be uniformly rich country I come from still created an unintentional and undesirable power differential. Sidaway (1992) points out that even if a researcher comes from a poor background, the fact that she is from a Western country may immediately (and involuntarily) elevate the researcher to a higher status and overall social position relative to others in the context they have shifted into.

Given these circumstances, I acknowledged that my positionality as a researcher could not be cast off so easily. This necessitated the development of research strategies and methods (see **sections 5.2. through 5.6.** for reference) that mitigated some issues related to my positionality as a minority world researcher conducting research in a majority world context (Jakobsen, 2012). Periodic reflection on the inescapable power dynamic arising from place became another justification for initiating a collaboration between myself and the local research assistants minimize interference with the reliability of data generated through the study (Powell, Fitzgerald, Taylor, & Graham, 2012).

Overall, remaining aware of my positionality and constantly trying to sensitively negotiate my interactions, not only with the girls but also with the broader NDSS community, was crucial throughout every research phase. In the next section, I will return to the question of how the girls benefited from their research participation, along with other ethical considerations made during this study.

## 5.9. Ethics in (Digital) Research with Girls

I will now examine the most prominent ethical themes: compensation, time, and the researcher-research participant relationship.

### 5.9.1. Compensation

The question of compensation for research participation raised in section 5.8 was perhaps the most challenging ethical dilemma I faced during the action research process. Like other researchers who have performed research in Kenya with people who have low income (C. Molyneux et al., 2009; S. Molyneux, Mulupi, Mbaabu, & Marsh, 2012), I found it difficult to decide what was appropriate, acceptable, and respectful of the myriad challenges that the girls faced to remain in school. There was a need to balance not offering too little or too much alongside ensuring that the compensation would not become a source of contention within the school community. By seeking input from the NDSS community on the matter, developing the compensation offered stood a better chance to be viewed as fair by people in the research context (Njue, Kombe, Mwalukore, Molyneux, & Marsh, 2014).

The eventual compensation package was comprised of financial, material, and indirectly psychological resource contributions. Echoed by the experiences of Kiragu and Warrington (2012) as they navigated the ethical landscape when considering compensation for their research participants in a rural part of Kenya, once I learned about the difficult circumstances with which the girls and their families grappled to raise enough money to pay school fees, I knew that compensation had to involve support in this area. Accordingly, I offered all research participants an honorarium of 3,000 Kenyan shillings (about US\$30), to be paid directly to NDSS for their fees. This amount represented approximately 12% of the total school fees for an academic year of a non-residential student, and was a substantial amount for the girls' families to raise on their own and on time.

I also provided material resource support by gifting them the used mobile phones I lent at the start of the Intervention phase. While the girls all had mobile phones that I physically saw in the Pre-Intervention phase, most were basic phones with limited functionality, not Internet-enabled, and/or were very dilapidated. Thus, I purchased used phones of a similar quality to the ones the girls owned but these phones could go online and have biNu and Worldreader installed on them. Enabling the girls to keep the phones helped them continue using the apps, if they could and wanted to, once the research concluded. Conducting research with girls who already had mobile phones in many ways made the most sense methodologically – and was the most useful from a data quality standpoint. Girls who were not able to participate in the study were still provided with material resource support since on two occasions I made donations of notebooks, pens, and pencils for every girl enrolled at NDSS.

### 5.9.2. Time

Time, particularly during after-school hours, was a recurrent theme that intertwined with ethical considerations of designing and conducting research with the 22 NDSS learners. To start, I asked the girls to participate in a year-long study which required them to spend approximately 1.5 hours each week conducting research with me. On one hand, the research always occurred during after-school hours when they would usually engage in cleaning duties at school, something they universally did not enjoy doing. On the other hand, this time after school was also one of the few opportunities the girls were accorded where they could socialize with classmates or participate in specially-arranged extracurricular activities such as Swahili lessons.

Compounding the time issue was that six girls were also observed on their journeys home and in their homes when the school day ended. Several researchers note that girls in developing contexts whose families give them the opportunity to attend school often experience significant demands on their time since they are expected to maintain contributions to the household in the form of paid and unpaid work once school concludes for the day (Kiragu, Warrington, Rarieya, & Githitho-Murithi, 2012; Porter et al., 2010; Warrington & Kiragu, 2012).

Considering these circumstances, I devised ways to work with the learners to, as much as possible, reduce the disruption to their daily routines during the academic year. Part of this included limiting research interactions with each girl to one time per week, whenever possible. I also conducted participant observations after school with the six girls who agreed to this research method for no more than one week during each of the three terms in a Kenyan academic year. Additionally, the 22 research participants were always, without exception, given the opportunity to decline participation before each research activity. On at least ten separate occasions, for various reasons including the need to leave early because of an anticipated longer commute home or in the interest of attending a rare after-school event, girls asked to be excused from a research session. I viewed these responses very positively because they suggested the girls were comfortable enough with me to voice their needs. Maintaining an honest dialogue about their time constraints was also a contributing factor to the research quality, as girls who felt rushed or forced to give their time would be unlikely to provide answers that reflected their true thoughts.

### 5.9.3. Researcher-Research Participant Relationship

Another angle from which I had to consider my position as an outsider adult researcher working with girls in a developing context is proximity. As I grew more deeply embedded in the research context, there was a need to reflect on how I could maintain a degree of

professional distance while simultaneously cultivating relationships that would a) support the girls and b) facilitate the successful implementation of the action research.

In their discussion of conducting ethical research with a different vulnerable group, refugees, in Kenya, Thailand, and Sri Lanka, Mackenzie, McDowell, and Pittaway (2007) advance the idea that one can manage this potentially problematic situation by:

...negotiating a research relationship with participants that not only respects, but also promotes their autonomous agency and helps re-build capacity. It is argued that the principle of respect for persons entails a responsibility on the part of researchers to try to understand and engage with the different perspectives and life experiences of research participants and to construct research relationships that are responsive to their needs and values. (p. 301)

While in principle I agreed with the above approach as the basis on which to design my research interactions with the girls, I had to consider if this was actually practical in this context. Although the persistent view of boy and girl children as 'adults in development' is consistently challenged in the literature (Danby & Farrell, 2004; Punch, 2002), the reality is that the girls in this study were used to being positioned as subordinate to adults, and were expected to show adults respect with no real expectations of reciprocity. Situations such as this again raised the need for me to engage in reflection whenever I interacted with the girls to ensure that our relationship was close, but not too close, while at the same time guiding them to view me as an adult, but one who respected them as autonomous individuals.

#### 5.10. Study Limitations

Because care was taken to develop the study design in a manner that respected the research participants, there arose study limitations from the design developed.

Perhaps the most significant limitation to this study was time-related. I was limited to conducting research with the girls during a narrow window of after-school hours between 4:00-6:00pm, a time when different activities such as cleaning responsibilities, sports, revision, and Swahili practice competed for the girls' attention. This meant that some girls learners elected not to participate in research activities when there were other activities they wished to be involved in. Additionally, this time of the day was when it was most noisy since the official school day had ended; research activities were sometimes punctuated with delays and interruptions. This environment could have affected the girls' concentration on the research activities. Nonetheless, these issues contributed to innovative moments in methodological design, such as conducting mobile interviews (Porter, Hampshire, Munthali, et al., 2011) during the journey home from school as part of the after-school participant observations. In this way, I extended the time I spent learning



about the research impact in a manner that did not place an additional time demand on the six learners with whom I alternated traveling home.

One other study limitation is that there was an element of uncertainty about the data collected from the two mobile applications. While each girl created a unique user ID, at the time this study was conducted, one did not always have to be logged in to use the apps. This meant that some app activity may not have been recorded. In response to this possibility, I periodically reminded the research participants to check they were logged in when using the apps to prevent data loss. Separately, though the research participants were instructed not to share their mobile phones with anyone else, there was no way to guarantee that every activity logged under their user ID actually originated from the girls in the study: Because each girl owned her phone individually prior to the start of the AR process, individual use seemed to be the extant practice. Individual phone use served to protect the girls from device theft and abuse of their mobile phone credit. However, owing to the novelty of the apps, some research participants remarked that they had showed the apps to their friends during the study, potentially introducing a collective practice that could have skewed the app usage statistics. I had to rely upon the girls' honesty in confirming that they did not share their mobile phones, but there was no way to guarantee that all the activity documented came solely from the 22 research participants.

### 5.11. Conclusion

In this chapter, I have detailed the methodological design created for this study. I noted the various tensions that arose when conducting research as a foreigner in a context with young girls. Acknowledging and then discussing the approaches I took to navigating these tensions served to highlight the complexity involved in conducting this study. Throughout, I intentionally kept focus on the people (secondary school girls at NDSS), and sought to explore how best I might help them increase their choices for educational content access after school. I introduced an innovative research method called the resource portfolio card game. This activity enabled me to operationalize the constitutive elements of the girls' resource-based agency so that I could understand which of the 11 resources proposed by Kleine (2013) the girls believed affected their education, whether positively or negatively.

Next, I will take the methodology developed here to analyze what happened when it was implemented. Kleine (2013) recommends, along the lines of Sen, to start using the CF by establishing what it is that the person or people have reason to value, before turning to the structure, agency, and degree of empowerment elements that influence choice and the possible realization of development outcomes (see **section 3.5** and **Figure 5.5** in this chapter). The desired primary outcome of having choice to increase access to educational content after school was discussed in Chapter 1 and section 5.4. What now follows is the

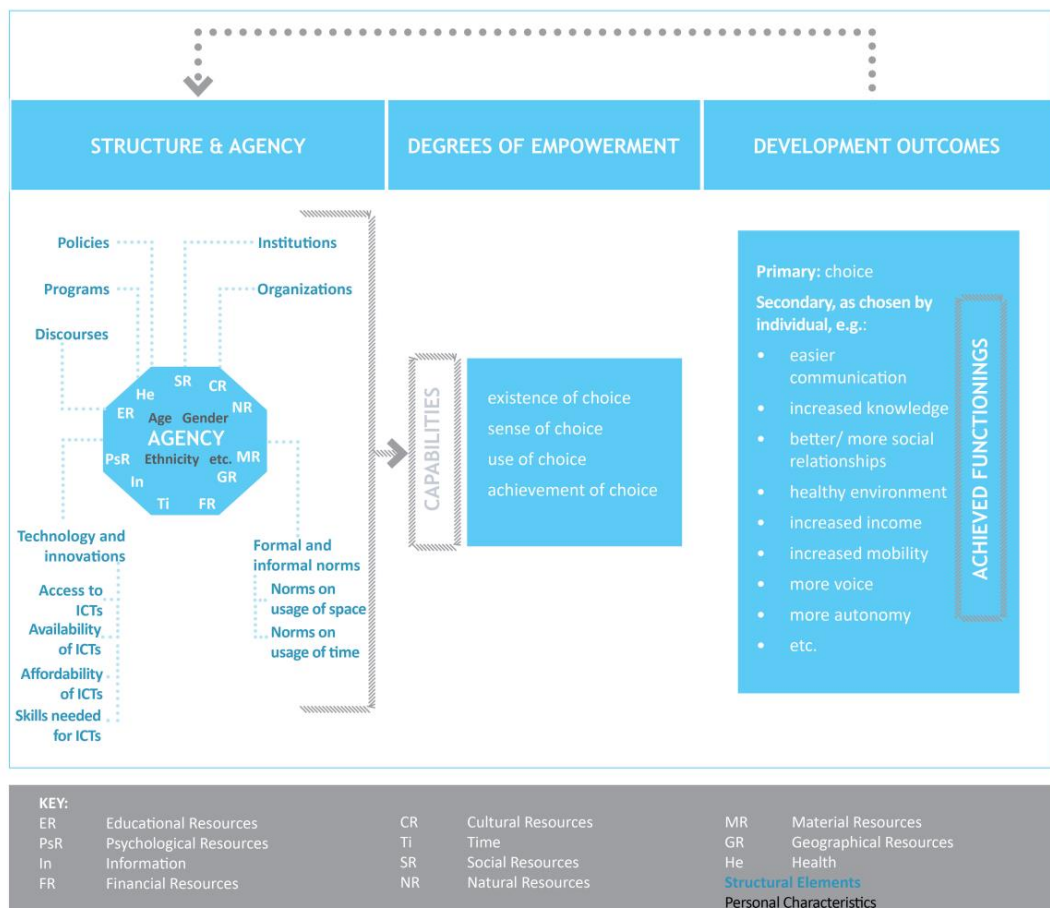
three analytical chapters. Chapter 6 will examine the structure and agency which was encountered in this context to deepen understanding of the several elements at play during this action research intervention. Then, Chapter 7 will discern how structure and agency affected the degrees of empowerment the girls experienced during the study, with a focus on the elements which were either empowering or disempowering. The resource portfolio card game data will be used to bolster findings documented in this chapter and in the final chapter of analysis. Lastly, Chapter 8 will examine the primary and secondary development outcomes which later emerged during the study to assess which outcomes, if any, were realized by the end of the action research process. Through these analyses, I will focus on critically evaluating the valued doing and beings observed by the study conclusion given the data available.

# Chapter 6: Navigating Structures After School with Girl Child Agency

## 6.1. Introduction

The Choice Framework was introduced in Chapter 3 as a conceptual tool to support the operationalization of the capability approach in this intervention. Moving forward, the CF will be the lens through which this intervention is evaluated. After following the CF logic to identify, with the research participants, the desired development outcome they themselves had reason to value (see **Chapter 1** and **section 5.4** for reference), this evaluation will now examine the interface between the structural elements and resource-based agency components in this context (see **Figure 6.1**), and how these elements influenced the action research process.

**Figure 6.1**



*Reimagined Choice Framework. Developed by the Author based on Kleine (2013)*

Discussing youth agency from a development geography standpoint, Bell and Payne (2009) contend that development is spread across a continuum in which choice is expanded and/or constricted in response to positive and negative shifts in the social

networks that young people are born into, build, or encounter – as well as the contexts and structures that they must navigate. Giddens (1984), and following him Kleine (2007), also argue that structure is made up of many acts of agency – that structure and agency are co-constituent.

In an examination of children’s geographies and youth agency in Global North and Global South contexts, Jeffrey (2011) notes:

[...] that the nature of ‘agency’ and young people’s capacity to act positively in relation to surrounding structures varies a great deal across space and time. [...] Structures in a particular place do not press down on people in an even way over time. Structures not only shift in their nature and intensity with the passing of time, they also become more or less salient at particular extended ‘moments’ in people’s lives,” (p. 246).

From all the above, we can suppose that a child’s agency is influenced by the surrounding structures they navigate, and that this process is enacted over time. However, the amount of freedom observed within a child’s life also undergoes periodic change, especially as her age and gender (personal characteristics) expand and constrain her freedom to use available resources to negotiate socially constructed environments (Ballet et al., 2011). Adult stakeholders usually assume an important role in shaping the structures children encounter, and expanding or constraining the real freedoms children enjoy. Because of this, it is necessary for discussions which recognize that children’s capabilities are impacted by the influence and power people older than the children exert over them.

To offer an example of this from this study with 22 secondary school girls in Nairobi, **Table 6-1** provides a school day schedule for a typical NDSS student, including the activities that a girl might be found doing at certain times, and where. This was a structural factor imposed by adults on the children. In this chapter, I will use this table (which was presented earlier as **Table 4-1**) to consider the structural dynamics and the resource-based agency observed during this intervention. I will focus this investigation on the weekday period between 3:30pm and 11:00pm – the after-school period.

**Table 6-1**

Time Period	Activity
4:30 - 6:00 am	Wake up, preparations for school including cooking and eating breakfast
6:00 - 7:00 am	Travel to school
7:00 - 7:30 am	Perform school maintenance activities
7:30 am - 3:30 pm	Attend classes at NDSS
3:30 - 6:00 pm	Participate in extended school day at NDSS (school maintenance, extracurricular activi-
6:00 - 7:00 pm	Travel back home
7:00 - 9:00 pm	Perform chores including dinner preparation, washing dishes, etc.
9:00 - 9:30 pm	Eat dinner
9:30 - 10:00 pm	Clean up
10:00 - 11:00 pm	Complete schoolwork: revising, reading, studying, homework completion
11:00 pm - 4:30	Sleep

*Day in the life of a typical NDSS student (Author)*

The composition of resource-based agency will be unpacked as the analysis engages within two different yet interrelated structural framings: Although this study occurred during one period (after school), the activities were undertaken in two distinct places (school and home) that were linked by the girl children who traversed and gave meaning to them. Accordingly, I will begin by probing conceptualizations of girl child agency in the after-school hours at school from 3:30-6:00pm before surveying how girl child agency is constructed in the period from 6:00-11:00pm that happens at home. Because the CF accounts for 20 elements among structure and agency alone, it will not be possible to review each component in great depth due to the constraints of the thesis composition. Accordingly, I will sacrifice breadth to achieve depth in the discussions I do carry out.

At the start of the after-school analyses for school and home, I will highlight the structural and agency elements that I will discuss with a brief explanation of why other components will not be covered. The overarching goal will be to show how structure and

resource-based agency mutually influenced people across contexts during this intervention. I also intend to initiate a basis of findings to be constructed for Subsidiary Research Questions 2-6:

2. How, if at all, do norms on the use of time affect the girls' mobile use to IATECAS? (SRQ2)
3. How, if at all, do norms on the use of space affect the girls' mobile use to IATECAS? (SRQ3)
4. How, if at all, does access to mobile phones affect the girls' mobile use to IATECAS? (SRQ4)
5. How, if at all, do policies, discourses, and institutions affect the girls' mobile use to IATECAS? (SRQ5)
6. How, if at all, does the resource portfolio available to the girls affect their mobile use to IATECAS? (SRQ6)

## 6.2. Navigating Structures After School while at School

In the geographies of education literature, schools have been positioned as institutions that occupy a powerful space in children's lives that is infused with differential power relations (Thiem, 2008; Unterhalter, 2012). School as an institution in this study was a pervasive structural element itself whose physical representation had somewhat porous borders: When research activities were implemented at NDSS, the "school grounds during after-school hours" were essentially transformed into an in-between space that had the physical appearance of NDSS but with different temporal notions and associated activities mapped onto it. This after-school space at school might be thought of as a 'thirdspace,' or a space that has characteristics which are a hybrid of other spaces and is defined by its in-between qualities (Matthews, Taylor, Percy-Smith, & Limb, 2000; Philo, 2000). Even as a so-called thirdspace, the after-school grounds and the people that traversed them were inextricably linked to the same structural elements which framed New Day Secondary School. This meant that the consideration of agency on school grounds during the after-school hours could not be done without engaging with the structures which surrounded NDSS. Accordingly, the first part of the analysis in this chapter will delve into the structural elements linked to NDSS and which bore the most relevance to this study.

In the following sub-section, I will spotlight how girl child agency was constructed in this thirdspace with and through the following after-school structural elements at NDSS: technologies and innovations, policies, programs, discourses, and informal norms on ICT access with respect to time and space. I will interweave analysis on the relationships between these structural elements and seven components of the resource portfolio as

defined by the Choice Framework, including information, time, material, financial, educational, psychological, and social resources. The other four resources, health, geographical, natural, and cultural resources, may be mentioned but will not be discussed here in detail because they will be discussed further in subsequent sections and Chapters 7 and 8.

### 6.2.1. The Value of ICT4E Initiatives at NDSS

In sub-section 4.2.4., I recounted the circumstances surrounding the 2008 government ban (policy) on mobile phones (material resources) being carried to school (institution) or used there by students. To understand how this policy action impacted girl child agency both at and after school, we must briefly revisit the socio-historical context at the macro-level in which the ban was enacted.

By 2008, in part because of the increasing privatization of telecommunications services, the promotion of mobile service consumption, and the continued lack of fixed-line telecommunications infrastructure in the country (Manji, 2008) (see also **sub-section 4.2.4.**), mobile adoption in Kenya was estimated to be within reach of nearly 11 million people who were 16 years of age or older (Gillwald & Stork, 2008). With a population estimated to be 38.2 million in the same year, this meant that almost a third of the population had been exposed to mobile technology to some extent. As more people got mobile subscriptions, network effects made mobile technology more useful as a structural innovation in Kenyan society (Ndung'u & Waema, 2011). This adoption was bolstered by the introduction of M-PESA, a mobile service that enabled users to send and receive money with their mobile phones (Aker & Mbiti, 2010; Gajjala & Tetteh, 2014). Partially due to grade repetition (Brophy, 2006; Hungi & Thuku, 2010), it was probable some of the 11 million people thought to have adopted mobile technology in Gillwald and Stork's (2008) surveys were also youth aged 16-19 enrolled in secondary school.

The government policy banning students from carrying mobiles to schools in the aftermath of the 2007-2008 post-election violence was for a specific time and set of circumstances linked to, in part, to people's social resources (membership of the group secondary school students), and age and ethnicity as personal characteristics (Trucano, 2015a). But the policy's continued enforcement six years later did not temper government enthusiasm to use ICTs in education altogether.

Returning to Kenya in 2014, the policy banning mobile phones remained even as youth mobile ownership, including for girls, gained ground (Gillwald & Deen-Swarray, 2013). Alongside this growth, between 2008 and 2014 a national program emerged which further embedded ICTs in school-based education in this context: one laptop per child (OLPC). The current president Uhuru Kenyatta declared during his presidential campaign in April 2013

that if elected, by January 2014 he would implement an OLPC program, which would eventually be scaled up to secondary schools (Apollo, 2013).

OLPC is a supranational initiative first conceived in 1995 and crystallized in 2002 at the U.S. university MIT by well-known techno-optimist Nicholas Negroponte (OLPC, 2016b). The aim is to “...empower the world's poorest children through education,” (ibid.), specifically laptop computer-based education. The program was officially launched in 2008, is now active in 42 countries, and is purported to reach over two million children through its laptop distribution efforts (OLPC, 2016a). However, OLPC is controversial in academic and practitioner circles because OLPC’s model is driven by a strong sense of mission but a for-profit motive (Villanueva-Mansilla & Olivera, 2012). Moreover, these motivations often conflict with the education systems in the contexts in which the program is implemented (ibid.). Further still, when OLPC is implemented, it is done at a substantial cost to cash-strapped governments (Hollow, 2010). The program also raises expectations for the benefits to be realized through ICT4E but so far has largely failed to deliver on this promise, and is criticized for siphoning away from education investments that are more likely to contribute to better outcomes, such as teacher training and pay (ibid.).

In Kenya, the OLPC plan was that children enrolled in primary school would be given solar-powered laptops free of charge, and teachers would be trained to facilitate instruction with the devices. Over time, the program would reach secondary schools. The stated goal is to help Kenyan youth develop the 21<sup>st</sup> century skills needed so that they can obtain future success, perhaps even contributing to the government’s flagship Vision 2030 development plan (see **sub-section 4.2.4.** for further details of this plan and the links to promoting STI in Kenya).

OLPC built on previous programs which forcefully promoted computer adoption in Kenyan schools (Ayere, Odera, & Agak, 2010; Wims & Lawler, 2007). This push was itself part of a broader trend in ICT-enhanced learning seen globally, undoubtedly driven in part by private sector interests to find new markets for their e-learning products (Jobe, 2014; Kleine & Unwin, 2009; Zawacki-Richter, Bäcker, & Vogt, 2009). The government’s OLPC program, as expected, also requires considerable monetary investment into ICT4E. This, despite evidence which indicates similar programs in East Africa have not proven to be a good value for money in light of the extremely uneven realization of stated program aims (mostly to enhance children’s educational resources) (Kiplagat, 2014). The OLPC program was one way in which the government communicated its emphasis on computerized education, and the program was part of a government strategy which continued to invest heavily in technologies and innovations on the belief that it would stimulate positive and transformative impact (Castells, 2010; Waema & Miroro, 2014).



The high-profile nature of this program effectively cemented the status of personal computers (both a material resource and structural innovation) as the technology valued by the government for use in educational settings throughout Kenya. Despite its intentions, the OLPC program surfaced chasms between this government program and the teachers at New Day Secondary School. It is important to consider the NDSS teachers in this discussion because of their role in contributing to the development and performance of girl child agency after school in this context, especially where technology use is concerned.

In the wake of Kenyatta's 2013 promise and initial efforts to make the program a reality, many Kenyans questioned the feasibility of the OLPC project, particularly from the perspective of its cost and sustainability (Osewe, 2013). At NDSS, other, more direct concerns became evident during the participant observation I conducted:

**Researcher's diary entry January 17, 2014:** *We were just on strike and they are still pushing forward with these laptops. They haven't paid us what they promised. Conversation between a group of five female teachers in the NDSS faculty break room<sup>17</sup>.*

In the quote above, the teacher is referencing a broken promise the former Moi government made to increase teachers' pay gradually. The financial resources owed to teachers had yet to materialize, resulting in strikes that occurred during the exploratory study in July and August 2013, as well as twice during the 2014 academic year during the main study. While I was based in Nairobi between December 2013 and June 2014, I documented at least ten occasions when teacher conversations, sometimes conducted in Swahili<sup>18</sup> but mostly in English, referred to their salaries in response to reports of projected OLPC program costs. The opinions conveyed illustrated general agreement that the program's announcement presented more questions than answers, and that it was possible it may not materialize:

**Researcher's diary entry March 27, 2014:** *Did they say laptops or lollipops? Those children will never see those computers. Discussion held between two male science teachers in the NDSS faculty break room.*

**Researcher's diary entry June 4, 2014:** *But who will be responsible for the laptops? They always find ways to add to the load we teachers carry. I am sure the responsibility will fall to us. Conversation observed between female music teacher*

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<sup>17</sup> As part of my introduction to the research community, teachers were informed that I would be conducting observations of them and making notes as part of the overall AR context. This was explained to include that I would be listening to faculty break room conversations. Because I came to be considered an unofficial part of the NDSS community over time, permission was granted for this observation. Moreover, Julie performed regular check-ins with the teachers when I was not present to communicate that all names would be anonymized if conversation content was shared and to obtain permission to continue this observational work.

<sup>18</sup> Although I had a basic command of Swahili, after a lively discussion took place in the NDSS faculty break room, I usually asked someone to explain what had been discussed. From there, I made notes on the summary that was interpreted for me.

and male math teacher in the NDSS faculty break room during the after-school planning period.

This ongoing discussion was to be expected given the extensive media coverage the program had been given since its inception (Goodwin, 2014; C. Mungai, 2015; Mutambo, 2013; Ngugi, 2015).

The situation highlights that, contrary to some depictions of people in the Global South as uncritical of or overly hopeful about ICT4E projects which promise quick and easy solutions to long-standing problems (Hollow, 2010), there are examples of people who question these initiatives for myriad reasons. By raising the point that the OLPC program is moving forward with the stated purpose to improve teaching and learning, the first teacher's incredulity was likely to express a grievance that teachers' pay was not being prioritized in government spending at the expense of ICT4E goals. The other teachers' remarks suggest that they did not take the program seriously. Indeed, by January 2015 there had not been any OLPCs to primary school children in Kenya. Other teachers expected them to arrive eventually, but this caused them to worry that the program's implementation would mean more work for them, causing loss of time as a resource, which to them was hard to accept given the ongoing pay disputes.

Previous studies have examined secondary school teacher motivations in Kenya (Bennell & Akyeampong, 2007; Wekesa & Nyaroo, 2013), and compensation recurs as a factor that can yield a multiplicity of undesirable development outcomes: Low salaries paid to professional teachers in the country have contributed to low morale, absenteeism, and the need for teachers to seek additional employment, including in the provision of shadow education (see **sub-section 2.3.1.**). Teachers have also resorted to strike action over pay, which disrupts instruction during the academic year. As an aggregate, these outcomes could contribute to hampering ICT4E program rollout because poor teacher attitudes towards such initiatives, and a lack of informed and fairly compensated school personnel to facilitate the program on the ground, are likely to result in poor program performance (Ottenbreit-Leftwich, Glazewski, Newby, & Ertmer, 2010).

The discourses circulated by teachers who thought the ICT4E program may not come to fruition or would cause an additional burden for them, also highlights the complexity involved with launching such an initiative without having teacher support. This is because school personnel, particularly principals, are vital to creating leadership for and a sense of ownership of these programs (Mingaine, 2013). Without this leadership, ICT4E programs are more likely to fail. Nevertheless, it is quite possible that the comments were not just about pay or the burden they might add to teachers at NDSS when the program eventually reaches secondary schools: Another underlying reason for these remarks could

possibly have been the fear that broadening individual technology use in schools would eventually be used to supplant teachers or even contribute to strike breaking in the future (Trucano, 2015b).

Although NDSS had a computer lab (material resource) (see **Plate 6.1** and **Plate 6.2**) with 22 computers running Windows 8, use of these 22 computers was often done in groups since the number of learners in an ICT class always exceeded 22. Only one teacher was responsible for this instruction and the lab's upkeep, and other teachers at NDSS were not required to use computers for instruction – even though government-funded training in this area was provided on one occasion while I was based in Nairobi.

**Plate 6.1**



*NDSS computer lab, left hand side view (Author)*

**Plate 6.2**



*NDSS computer lab, right hand side view (Author)*

This situation presented what might be considered a non-threatening way to integrate ICTs in education since it did not require all faculty members to step out of their comfort zones with more familiar instructional approaches. Moreover, shared computer usage could help

the ICT teacher maintain control more easily over computer activities when compared to what might be possible with individual laptop use, aligning with existing power dynamics between teachers and students (Orodho, Waweru, Ndichu, & Nthinguri, 2013). The setup in a separate room also muted a worry-inducing discourse in Kenyan education that teachers may one day no longer be needed to mediate between the computer and the learner because the ICT teacher was positioned as an indispensable guide.

Government opinion about the OLPC program contrasted with this, often expressing that they were keen on individual ICT use, and did not mention teachers much: “Critics of the programme have reduced this noble project to ‘delivery of toys to school children’. Nothing can be further from the truth. Contrary to this viewpoint, the laptop project is a potentially potent tool for effective teaching and learning,” (Kaimenyi, 2013). These words, written by the country’s Education Minister at the time, provided the rationale for why teachers might fear one-to-one ICT4E programs. This is because although technology is referred to as a tool, the virtues of the laptops are uncritically lauded, with only brief mentions to teachers and learners, and their respective program roles in realizing education-related development outcomes.

While teaching staff at NDSS raised reservations about the OLPC program, their own existing ICT4E program was not challenged openly, to my knowledge – perhaps because it was already implemented in a way that was agreeable to them. It could also be that the program established was championed by the school’s leadership, which in turn made them accept it: In an exploratory study interview conducted with Principal Sumba<sup>19</sup> in August 2013, we see that as the school leader, her perspective on ICT integration in education, including the impending OLPC program, was clearly more positive:

**Ronda:** *I know you’re familiar with the government plans [referring to the OLPC program]. What kind of influence do you think this is having on teachers and principals to use technology for educational purposes?*

**Principal Sumba:** *Yes, everything is going technological, so it’s very important for even the teacher to adopt, to accept. They are still learning or sticking to the old ways of teaching, but the new ways you must open up to. It’s important for them to accept technological education because learning will be enjoyable, it will be easy, it will be faster.*

These remarks could have been made with the intention to portray herself in a favorable manner with respect to her perspective on ICTs in education. But it is even more likely that because she was responsible for implementing the government mandate, Principal Sumba echoed the technophile approach of the OLPC program with its promise of educational benefits, and as a symbol of progress and modernity. Much like Education Minister

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<sup>19</sup> As before, all names and places in this thesis have been anonymized, apart from those of public figures like the Education Minister.

Kaimenyi, she also chided teachers for resisting the adoption of more contemporary teaching methods, which she notes should include technology use. Similarly, her positivity focuses on the technology itself, and the supposed benefits listed are subjective and heretofore unproven based on analyses of extant OLPC programs in Kenya (Kiplagat, 2014).

Because of the position of authority Principal Sumba holds at NDSS, her leadership is a powerful factor in shaping the performances of her faculty and staff with respect to ICT integration in secondary education (Mingaine, 2013). It is also worth noting at this point that when I initially introduced the idea to explore mobile learning after school with her population of girl learners, Principal Sumba appeared to be comfortable giving her permission after she received a copy of the letter from KICD, which granted its own permission at the national level. In the absence of this government permission, which, in this context, was tantamount to an endorsement of the research I was doing, I am uncertain that she would have shared the same positive outlook for the study (which will be examined further in the next sub-section), especially because of the policy banning mobile phones at schools. This suggests that the principal was willing to carry out decisions from the government and broadly repeat the government line.

These interactions between:

- a national program,
- government as an institution and its discourses,
- laptops as a technological innovation in
- schools as an institution,
- the principal's own discourses and position of authority, and

teachers' concerns about the OLPC program implementation all contributed to the creation of a structure at NDSS where education technology interventions, especially those which were unproven, were sometimes viewed sceptically, and at others seen as a good opportunity to enhance education. This shows how, if at all, nationwide ICTs in education integration was valued by NDSS stakeholders. This analysis surfaced attitudes that bore relevance to this AR intervention in terms of the general perceived utility of ICTs as a tool for learning among stakeholders in the context. This macro-level analysis also helped build connections to some of the dynamics observed at the local level regarding NDSS faculty and staff perspectives on ICT4E for their girl learners, particularly during the after-school hours.

### 6.2.2. Valuing Mobile Learning at NDSS for After-School Agency?

Once formal schooling ended each day at 3:30pm, for at least 2.5 hours afterwards, Principal Sumba expected most NDSS faculty and staff to remain on campus to facilitate

after-school activities such as clubs, extra tuition, sports, or school maintenance supervision. It was during this time when more student-teacher interactions not associated with formal schooling could occur. When possible, I used this as an opportunity to document observations of extant after-school practices. I also spontaneously spoke with NDSS personnel to gauge their perspectives on the girls' ability to use mobile phones after school to support their learning. These experiences began to surface gendered dimensions to some structural elements, including discourses about mobile phone use.

During this intervention, discourses were found to play a salient role in shaping how mobile as a tool for learning was valued in the thirdspace during the "after-school hours at school." While conducting the exploratory study in July 2013, I asked NDSS teacher Sarah Kibere her opinion on the girls' after-school mobile use:

**Ronda:** *Do you think that mobile phones could be used by the girls here at NDSS to learn things after school?*

**Sarah:** *It can, but only when they are not in school [emphasis added]. Given the age of the students here, because they are young, instead of using it to learn they would use it for other things. Like the socializing bit of it. After school it can be used, but when they are in school, right now they are urged to get there.*

**Ronda:** *So, when you say 'after school,' do you mean once they have finished Form 4 or after the school day ends?*

**Sarah:** *Yes, once they finish Form 4<sup>20</sup>. Because even back at home, even if this is a day school, even when they have that phone, they would never use it to learn. Instead, they would use it to get onto Facebook. And these days the kind of things people are posting on Facebook they actually are affecting the moral fabric of these girls.*

**Ronda:** *How so?*

**Sarah:** *Because they are posting even nude pictures, pornography. Even the language used is very detrimental at this age. They get influenced. [...] Apart from that, when they use their phone, the issue of their boyfriends sending them texts, calling them and then they get distracted.*

Sarah's comments first stress that it is not only in the after-school hours that she finds girls' mobile use problematic. Her statement "right now they are urged to get there" is used to insist that girls should finish secondary school before anything else. Once they reach that stage, she suggests that it is then it is acceptable for them to utilize mobile phones for learning.

The teacher's remarks raise a few points linked not only to gendered discourses but also to discourses based on the age appropriateness of the use of a specific ICT (mobile) for education. Firstly, Sarah's reference to the potential corruption of "the moral fabric of these girls" to an extent implies that she believes girls are prone to be corrupted. In this case, mobile is the vehicle which exposes girls to dangers, which, by her account,

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<sup>20</sup> By the time a girl finished Form 4, she would usually be at least 18 years old and could be even older depending on if she had repeated grades.

include pornography and attention-seeking boyfriends. The lack of acknowledgement of how boys' behavior seemed to be the instigating factor for girls' distractions is a gap in Sarah's argument about girls' inability to exercise control over their after-school activities with their phones. This situation is commensurate with the portrayal of females in Kenya, including in educational settings, is often one which positions them as passive and disempowered (Bhana, Morrell, & Pattman, 2009; Milligan, 2014). Sarah's view on after-school mobile learning and girls' morality also seemed to be shared by some of the parents and guardians at NDSS, as evidenced by the comment one of the 22 research participants made during an FGD conducted during the Intervention phase in June 2014:

*Susan: My dad complained and told me that I was using the phone more often [after being introduced to biNu and Worldreader]. So, when I explained to him, he said it is just okay and I should not use the phone for the wrong purpose [emphasis added].*

Kenyan girls are told to exhibit behavior which is deemed morally upright so as not to invite harm to befall them (Unterhalter, North, Karlsson, Onsongo, & Makinda, 2009). Due to the absence of guidance from adult stakeholders about how to engage in 'appropriate' uses of their mobile phones, girls in this context were not supported with the educational resources needed to conform to the behavior expected of them, and instead were simply told to stay away from mobile phones.

Reviewing the gender socialization process which takes place in schools and with particular reference to the Global South, Stromquist (2007) states the following about the various structural elements which frame this process:

Discourse contains normative views about how people should be and shapes their actions. The process of identity formation in schools emerges from the interplay of expectations (roles that students are supposed to play in the future), attitudes (feelings toward them), and behaviors (practices in the classroom). (pp. 6-7)

Here we see that the author's conceptualization of discourse is itself linked to attitudes, school as an institution, and the norms that contribute to the reproduction of expected gendered performances. Applying a CA perspective to the gender socialization process, Walker (2007) remarks:

But formal education, particularly at the level of compulsory schooling, is a crucial site for reproducing and transforming social norms and culture and for identity formation (who we take ourselves to be), which identities and abilities count (and which are devalued), and what we see as possible for ourselves. (p. 178)

Although Walker does not explicitly name discourses, we can safely assume that the reproduction she notes occurs at schools indeed involves the things that different stakeholders communicate to one another. Other scholars concerned with transforming freedom-constraining practices in girls' education in sub-Saharan Africa, including those

who consider human development from a CA perspective, have also found examples of how transmission of discourses in schools can contribute to the perpetuation of harmful social practices that continue to disadvantage girls and their ability to lead lives that they have a reason to value (F. N. Chege & Arnot, 2012; Leach & Humphreys, 2007; Unterhalter et al., 2009). These discussions underscore the powerful nature of discourses, and is indicative of the difficulty there is in challenging and changing discourses which seek to limit the real freedoms that people can enjoy. That Sarah is a woman who was once a girl in secondary education herself illustrates how women can be used to contribute to the reproduction of discourses and norms which can limit girls' future opportunities. Nonetheless, I acknowledge that keeping girls away from phones is a different level of disempowerment than suggesting they should participate in even more concerning and harmful practices (e.g. female genital cutting).

Wrapped in Sarah's statement were also references to the girls' youth (age as a personal characteristic). She indicated that due to the girls' ages, their ability to enhance their educational resources after school would be outweighed by their desire to connect and socialize with friends or members of other kinship groups (social resources). In doing so, these interactions could put objectionable content in front of the girls that would somehow harm their virtue.

The direct mention of Facebook exposes the prevailing belief among adults in Kenya that youth spend much time – and indeed their money (financial resources) – to access social media platforms (structural innovation) (Hansson & Wihlborg, 2011; Mukhongo, 2014). In doing so, the sense is likely that these activities detract from other choices the adults believe are more valuable for youth to make, such as formal learning pursuits. However, the negative sentiment Sarah shared about Facebook is not unique to Kenya: In the UK, a neuroscientist claimed Facebook and other social media platforms are distractions that can cause children's brains to be rewired and shorten their attention spans (Derbyshire, 2009). This contributed to an outpouring of parental concern in Europe about these sites and the potential harm they can expose children to; data gathered seemed to support the cause for concern (Livingstone & Brake, 2010; Staksrud, Ólafsson, & Livingstone, 2013). Even still, research in the European context has also showed that, contrary to expectations, many children who went online and used social networking platforms generally complied with any norms their parents expected them to adhere to (Livingstone, Ólafsson, & Staksrud, 2013). This implies that a parent, guardian, teacher, or other trusted adult stakeholder in a child's life can be influential in helping them make better decisions about the interactions they have online.



Conceptualizing children's agency from a capability perspective, Ballet, Biggeri, and Comim (2011) state that: "in the case of children, age becomes a highly relevant factor in shaping their capabilities, especially as age is combined with a range of formal and informal social norms in different cultures and societies," (p. 29). We saw in sub-section 3.2.4., through Saito's (2003) writing on the CA and education, that adults, including parents, guardians, and teachers, can play a direct role in helping children realize present and future freedom expansion. When viewed in this way, it is quite possible that Sarah was indeed seeking to highlight her responsibility to prevent activities which might unintentionally harm the girls, thought to happen by allowing them to come into contact with materials that contribute to bullying, harassment, or unguided sexuality exploration through pornography (Kamaku & Mberia, 2014). But by advocating that the girls should not use their mobile phones to go online or to visit social networking platforms until they finish secondary school, Sarah would also delay potential exposure to risks online without removing these risks altogether.

Above, we see the commingling age- and gender-based tensions present between the sense of duty adults may have to protect their learners, girls' potential to make use of mobile technologies for purposes that adults could deem worthwhile, and the predominant and gendered belief that even if they had the choice, girls would simply be distracted by activities that would heighten the possibility of their moral corruption. But when examining statements that Principal Sumba made during the exploratory study interview I conducted with her in August 2013, we see that Sarah's views on mobile use for learning after school were not shared:

**Ronda:** *Do you think that mobile phones could be used by the girls here at NDSS to learn things after school?*

**Principal Sumba:** *So much, very much, because it has everything. It does everything in terms of education, correct. Constructivist education so it can assist them.*

**Ronda:** *And you said before they just need information about the things they shouldn't do with the phone?*

**Principal Sumba:** *It even gives them information on the 'dos' and the 'don'ts', so it is educative in both ways.*

Once more, questions could be raised by the enthusiasm Principal Sumba displays towards ICT4E. Her perspective here remains positive even when mobiles are the learning medium. She also posits that girls will learn the norms about appropriate and inappropriate uses from the device, without specifying how this was possible. While it is entirely plausible that she actually believed what she said, it could also be the case that Principal Sumba was providing socially desirable answers to a mobile learning researcher approved by the government. Even still, her support, a real reflection of her opinion or not, further shaped

the structure of the after-school hours at NDSS in terms of the intervention we undertook which included mobile use.

However, I also encountered a male chemistry teacher, Samuel Okono, who expressed similar views to Principal Sumba in the exploratory study interview I conducted with him in July 2013:

**Ronda:** *Do you think that mobile phones could be used by the girls here at NDSS to learn things after school?*

**Samuel:** *It will be helpful to them, like I see most colleges today rely so much on mobile phones for their research. It will be easier for me now and cheaper for me to use the mobile phone than a laptop. I live with college students – two of them – and they rarely move to the library because everything is on their phones.*

**Ronda:** *[...] If the students at NDSS could use a mobile phone for learning after school or learning at home, would you be willing to let them use the phone for this purpose?*

**Samuel:** *I would be willing to let them use the mobile phone, I would not have a problem with it. I think there is that conservative idea of mobiles being bad: “They go to pornography, they’ll share boyfriends, bad information,” and such. But that should not be a reason [to not let them use their mobile phones after school]. The advantages far much outweighs the disadvantages to me.*

The theme of age as a personal characteristic with respect to technology appropriation recurs, except in this case older youth are positioned as an example that the girls at NDSS might follow. Samuel admires college students’ mobile use to conduct research instead of using laptops since he himself finds it more affordable (affordability of ICTs) and he has the skills (educational resource) to use his phone for this purpose – presumably easier than a laptop, based on his statement. He also notes that mobile use has contributed to a change in his housemates’ mobility since, according to him, they do not have to make journeys to the library and can instead use their phones to access what they need. This probably saves them further time as a resource since they do not have to commute to get the information they seek, and saves them money (financial resource) if there are transport costs to be accounted for in the journey to the library. These comments indicate that because Samuel could see some of the benefits of mobile learning activities directly, he was more open to this medium as a tool for the girls he taught at NDSS. While I do not believe having books on your mobile is the same quality as having physical access to a library, there are some possible advantages to mobile-based access when movement is prevented, as noted in Samuel's comments.

The references Samuel made to pornography, boyfriends, and bad information mirror the exact same issues that Sarah said could affect the girls’ moral fabric when they use their mobile phones to go online. Sarah’s idea that the girls should wait until they finish secondary school before using mobile phones presents a behavioral norm intended to help them avoid encountering digital risks they may not be able to handle. Although Samuel

acknowledges the threat of encountering bad things online, in his assessment of the good that could come from using their mobile phones after school to learn, he seems to believe that the threats should not deter this use. He also characterizes the potential risks as “conservative ideas,” hinting that he is aware these ideas may speak to gendered norms on girls’ morality and chastity, and how both should be maintained. He might also be using the word ‘conservative’ in the sense of the techno-skepticism expressed by older people who are afraid of new technologies.

Overall, the interview with Samuel pinpointed further discourse-based evidence about how Kenyan society perceived mobile technology when it was in the hands of girl children during this study. Samuel was himself married with three young children, including two girls who were of primary school age. This made his statements unique in this context for a male with his background. His statements might even be viewed as an example of a man’s contributions towards gender equality for girls, actions that have gained increasing notice in recent years in Kenya and beyond (IPS Correspondents, 2009; Promundo & ICRW, 2012; UNESCO Bangkok, 2004; Urdang, 2008). This is because his open-mindedness to girls’ after-school mobile use was uncommon at that time and place, and likely alluded to his own desire for these circumstances to change. But this cannot be said for certain since, like Principal Sumba, he could have been relaying the government’s outlook on ICTs in education more broadly. Nonetheless, the specificity he added to his remarks and his repeated assertions during the study which remained unchanged substantiate this assumption at least partially.

In *Creating Capabilities*, Nussbaum (2011) states that “the purpose of global development [...] is to enable people to live full and creative lives, developing their potential and fashioning meaningful existence [sic] commensurate with their equal human dignity,” (p. 185). Part of this dignity should include enabling children to make decisions whose outcomes are more likely to enhance their freedoms, both now and in the future (Bessant, 2014; Saito, 2003). However, with the emergence of increasingly blurred boundaries between offline and online worlds in which children participate in place-making, including in educational and social contexts (Burnett, 2011; James & Busher, 2013; Reich, Subrahmanyam, & Espinoza, 2012), there is also a need to enhance freedoms that are associated with capabilities drawn upon through digital media. As Sarah states, the girls in this study may indeed face online threats that they should be wary of. Yet, as Samuel and Principal Sumba counter, it can be questioned whether halting their participation in mobile media practices altogether is the ideal solution when the girls could be taught about their rights online and how they can actively contribute to their own protection (Gasser & Cortesi, 2016; Livingstone & Bulger, 2014). In the absence of discourses that critically

inform mobile use in a manner that empowers youth to lead lives they have reason to value (educational resource), their dignity (psychological resource) can be assailed, and opportunities to unlock new choices within the technology can also be stifled.

The circumstances observed in this sub-section reveal further possible structural barriers that the girls in this study had to navigate if they wished to use their mobile phones after school for learning. While adult stakeholders at NDSS like Sarah communicated varied discourses, and hold different beliefs about girls' after-school mobile use, their own actions after school sent a message which could be said to conflict with this position, as I will now briefly discuss.

### 6.2.3. Age-based Contradictions in After-School Mobile Appropriation at School

One final point I wish to investigate about perspectives on ICT4E and mobile learning in the "after-school hours at school" is related to age-based norms. This is because age-based norms existed which shaped who could access their mobile phones after school at NDSS, and for what purpose, and who could not.

As recounted earlier in this chapter, the government policy which banned students from carrying mobile phones to schools was created to address circumstances at a specific time and place in which such action was deemed to be necessary. By the time of this study, the ban was still in place. However, throughout January to June 2014, I documented near daily instances of NDSS faculty and staff using their mobile phones for multiple purposes after school, often in full view of the girl learners. This could be expected since school faculty and staff were not subject to the ban. The teachers were often found researching information for professional development, or even using their phones to engage in formal learning activities:

**Ronda:** *Earlier, I asked if you had a mobile phone. Can you tell me what you use your mobile phone for?*

**Sarah:** *I use it to communicate to people, calling and texting. And I use it for 'Facebook'. I use it to do my research [for her diploma studies in Human Resources]. Then, from the same mobile phone, I have an email which I have synchronized. I am a student. [...] You'll find that through the same email I can communicate with my lecturer and send him, for example my projects. He can mark it and then send it back. And then I can do the corrections I am supposed to do.*

**Ronda:** *What other ways do you think a mobile phone might be used to help you learn?*

**Sarah:** *Depending on what one is doing. Because sometimes you know you can research, use it for research. For me, doing English, you can use it to check the spelling of words, the meaning of words, you can get the dictionary.*

The above excerpt comes from the same interview I shared earlier which was conducted with teacher Sarah Kibere in July 2013. Sarah was one of the teachers I frequently saw using her phone during after-school hours, sometimes in full view of the students.

Research with adolescents in the United States found that when teachers exhibit fairness in their interactions with them, their perception of those teachers is that they are supportive of their subjective well-being (Suldo et al., 2009). A quantitative study conducted at a public secondary school in Nairobi County suggests that teachers' leadership styles can have a direct impact on how their students behave (A. W. Chege, 2012). While I would not argue that the mobile phone ban at schools should apply to faculty and staff for practical reasons related to their job performance (e.g. their need to communicate with parents and colleagues), it does raise questions about the messages being communicated to their learners when they see their teachers using their phones after school for reasons unrelated to their work while the pupils are not allowed to use their mobiles at all, not even for educational purposes. These circumstances arguably put further distance between teachers and students in terms of the power differentials that bear on the after-school experience, especially when considering ICT use.

Furthermore, if, as Sarah said earlier, girls should wait until they finish secondary school and use mobiles when they are 'old enough', it was not clear who would then teach them responsible mobile use at that time. Technically, within Kenyan society, once a person reaches the age of 18 – the same age at which they would normally complete secondary school – they are considered adults who can make their own decisions. Sarah's mobile phone use after school presented an opportunity for her to model what she might view as good digital citizenship (informal norms on usage of cyberspace). Her skills in using Facebook, email, and a dictionary to support her own socializing and informal learning, respectively, after school could have been an occasion to enhance the girls' knowledge and skills (educational resources). This could be achieved through instructing them on the expected norms for their online behavior. The goal of this instruction would be that the girls they might also benefit from after-school mobile use in a manner like Sarah.

Speaking on the challenges and opportunities as Kenya's education sector deepened its engagement with ICTs, a former employee with the Directorate of e-Government noted that the responsibility – and indeed the willingness – to facilitate practices which promote child online protection remained opaque: "Is it the teacher, parent, government and even technology in manufacturer [sic] who defines and enforces the ethical use of information in the new set up," (Limo, 2010, p. 6). This suggests that at the time, the question of whose role it was to teach responsible mobile use was still being debated<sup>21</sup>, and thus teachers were not expected to provide training on appropriate mobile

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<sup>21</sup> Since this study was conducted, the Communications Authority of Kenya (CAK) has taken ownership of this work. CAK's mandate is to help protect children online by providing children and adult stakeholders including teachers, parents, and guardians, with information they need to support safe online practices. (CAK, 2016; Murianki, 2016).

uses. Even if Sarah had had that mandate, as noted in sub-section 6.2.1., the issue of teachers' pay in Kenya, and the expectation that they might have to assume additional duties that they are not compensated for, could factor into her attitude and approach. Additionally, Sarah may have had to acquire the digital literacy knowledge she has on her own, and perhaps felt no obligation to impart this knowledge to others herself.

While it appears that Sarah may not have felt it was her responsibility, Principal Sumba did confront the issue at least once in the Pre-Intervention phase during a hastily arranged after-school address to all NDSS students:

**Researcher's diary entry March 21, 2014:** *At an all-school assembly, the principal scolded the girls for sending inappropriate text messages [reportedly gossip about boyfriends] to each other after school. It is unclear how she was aware of this activity. She asked the girls: "Why aren't you writing to each other [on your mobiles] and talking about questions in your maths class?"*

In previous sub-sections of this chapter, Principal Sumba made remarks which implied that she might be positive about the potential for the integration of ICTs in education. What she said seemed to align neatly with the government's stance on the issue. Furthermore, I pointed out how it could have been possible that her positive remarks to me about the girls' using their mobile phones to learn after school were influenced by the government's support of my research. Yet, we see from my diary entry above that even before the intervention was started, not only was Principal Sumba encouraging after-school mobile learning activities that could enhance the girls' lives, she was also attempting to guide them to appropriate behavioral norms that could make their activities more palatable to adults.

While I make no claims about Principal Sumba's stance towards ICT4E nor any associated positive outcomes for the learners she leads, it is quite likely that the messaging in this assembly had some form of impact on the girls. This is because to have a figure with Principal Sumba's seniority and power to promote mobile learning after school was unusual in this context. Even if this discourse was not being echoed by the teachers they saw using their mobile phones after school, this implicit endorsement by a school leader likely raised awareness of mobile learning and its potential among the student population, and probably also surfaced questions among the learners about the contradiction of mobiles being banned for students in schools. However, the girls' ability to take advantage of mobile learning after school and *at home* in the way Principal Sumba suggested is another matter altogether.

This section has examined the structural conditions, including programs, policies and discourses, the girls had to navigate in their time at school, including during after-school hours. In the next section, I will reflect on the after-school hours from 6:00 to 11:00pm, when the 22 research participants in this study were at home. While their home

environments contrasted with their school in terms of the resources available during after-school hours, the roles played by parents and guardians as adults who shaped the girls' agency shared commonalities with faculty and staff at NDSS.

### 6.3. After-School Agency at Home

Engagement with interactions between the structural elements and resource-based agency components observed when the girls were at home will not be as extensive in this chapter as for the hours when they were at school. This is because in Chapters 7 and 8, I will develop a series of individual case studies which are intended to build a rich picture of how structural elements at home influenced certain girls' agency, and vice versa. In this chapter, I will examine the findings yielded from developing and applying a new participatory research method for operationalizing the resource portfolio conceptualized in the CF. Through this research method, the girls were invited to examine which resources they had and which they most needed to pursue their desired development outcomes, having choice to IATECAS. While I will focus on the girls' resource-based agency in this chapter, in considering the structural conditions in which their agency was enacted, I will also reflect on the role of parents and guardians, particularly some of the norms they created which affected the amount of agency the 22 research participants could exercise after school.

#### 6.3.1. Operationalizing the Girls' Resource Portfolios

During the AR process, I devised an innovative research method, the resource portfolio card game, to help answer SRQ6: *How, if at all, does the resource portfolio available to the girls affect their mobile use to IATECAS?* The detailed steps for undertaking this activity can be reviewed in sub-section 5.6.3.2. As a summary, I depicted the 11 resources that constitute agency in the Choice Framework. Next, I used these pictures to have the girls identify, in a participatory exercise, which resources affected their education and which did not. Based on their arrangements (see **Plate 6.3** to **Plate 6.5**), we then discussed which resource(s) had the most impact on their education, whether positive or negative.

**Plate 6.3**



*Resource card game arrangement made by a learner, showing the resources believed to be relevant to their education (Author)*

**Plate 6.4**



*Resource card game arrangement made by a learner, showing the resources believed to be unrelated to their education (Author)*

**Plate 6.5**





*Group of research participants discussing their selections for the resource card game (Author)*

The questions I asked about how the resources affected their education then led to focused discussions about how these resources intertwined with their lives after school.

At the start of the research process, based on the socio-economic situation of the school population, I assumed that the girls' available financial resources would be selected as the resource which affected their education most, and to have choice to IATECAS, in a negative manner: In Chapter 4, I described how this study was undertaken with a secondary school population in Nairobi which was historically marginalized from a socioeconomic and geographical standpoint. This resulted in chronic school fee payment delays by multiple NDSS households. Because this study made use of mobile phones and apps as material resources and technologies that might help the girls increase their access to educational content after school, and app usage depended on having mobile data purchased so the apps could work, these were further reasons I assumed the girls would identify financial resources as their biggest challenge.

As seen in **Plate 6.3** above, the girls did consider financial resources to be relevant to their education and ability to have choice to IATECAS. Nevertheless, while the girls recognized that financial resources had a (negative) impact on their educational experience, when asked to name the resource which affected their education most, 13 of the 22 research participants indicated time. Moreover, six girls identified geographical resources as the resource with the most influence, and all 22 girls acknowledged that geographical resources affect their education. Three girls identified material resources as most influential for their education, and only natural, educational, and cultural resources were consistently designated as resources which had no effect on the girls' education. Though I privately disagreed with this based on my knowledge of the context and because their

explanations for why these resources were excluded at times were contradictory (e.g. some girls said that they were going to school to acquire educational resources so they did not need any educational resources to attend school, which is not completely accurate), the aim of employing this new research method was to document the girls' perspectives and not to debate the accuracy of their arrangements.

Overall, I found, based on the girls' arrangements and the discussions carried out during the card game, that the time available and mobility possible for the girls after school affected their education most, primarily because both these aspects of the girls' agency were quite limited. In this context, time was understood as the amounts of time after school the girls could make use of to engage in activities of their choosing, and the frequency that they could exercise this choice. Mobility was comprised of the following resources, at a minimum: the girls' health, time, and geographical resources. Because I was unable to gather much insight on the girls' health due to my desire to respect their privacy and to avoid collecting data that was not crucial to the study, my analysis of their mobility was framed primarily around their geographical resources, and the influence of time on the same.

Time and mobility during the after-school hours at home were shaped by discourses, norms on the usage of space and time, as well as technologies and innovations, particularly access to mobile phones. What follows is discussion of these aspects of time and mobility based on the outcomes of the resource portfolio card game conducted in May 2014. Other after-school resources and the structural elements that influenced the use of these resources will be interwoven in this analysis where relevant.

### 6.3.2. Time and After-School Agency at Home

As I explained in Chapter 2, when discussions are held in the international development literature about girls and their time or their lack thereof, their experiences are frequently subsumed into those about women. The problem with doing this, particularly for girls enrolled in school, is that girls can face multiple burdens at once which induce time poverty. Furthermore, unlike women who may draw on support from children, girls rarely have anyone that they can draft in to help them manage their workloads. In this study, I therefore took care to conceptualize the girls' resource portfolios, including time, on their own terms.

When time was considered alongside the structural elements the girls navigated after school, significant challenges arose. The girls explained why this was the case:

*At home, I don't have time to read. Here in school, in the morning from 7:00 to 8:10am, the time that I used to read nowadays is used for remedial instruction. In the afternoon from 3:30 to 4:30pm, before you realize it, it is time to go home. Chores at home are keeping me busy.* Gertrude

*Like Linda, it is hard for me to read at night [during the after-school hours at home]. I must wake up early in the morning and study. Susan*

Adding to these quotes, in a dialogue I had with Wangari while conducting the card game, the following exchange occurred:

**Ronda:** *After you arrive home, what do you have to do?*

**Wangari:** *I arrive home around 7pm. Then I must clean my uniform before I prepare supper. After we eat, I begin cleaning around 8:30pm. If I am not too tired, I try to read before I go to bed at 10:00pm.*

**Ronda:** *Who makes your schedule after school when you are home?*

**Wangari:** *I do.*

**Ronda:** *Okay, but what would happen if you did not wash the dishes one day? Would you get in trouble with anyone?*

**Wangari:** *Yes.*

**Ronda:** *Who?*

**Wangari:** *My parents.*

**Ronda:** *If your parents determine your schedule after school and you still don't have enough time to study or prepare for your classes, do you think this has an impact on your education?*

**Wangari:** *Yes, they do not give me enough time.*

The experiences recounted by Gertrude, Susan, and Wangari highlight the pertinence of time to this study. As seen in the girls' school day schedule in **Table 6-1**, on average, the girls were afforded approximately one hour during the after-school hours at home that they could use to engage in learning activities if they so chose. Frequently, this hour came towards the end of a marathon, nearly 19-hour day where much of the schedule was determined and controlled by adult stakeholders in the girls' lives. From a resource-based agency perspective, the girls would arguably be tired by then (health) and lack the energy to engage thoroughly in academic matters. Norms driven by the gendered division of labor, specifically the expectation that they would perform chores during the after-school hours at home, worked against the research participants in a manner that further squeezed their education participation. Additionally, Nancy, Lupita, and Ayesha stated that they were responsible for performing care work at home on top of the chores they were assigned, a point explored further in subsequent chapters.

#### *6.3.2.1. Time when Grappling with a Triple Burden*

Dissecting the multi-faceted challenges encountered when trying to educate Kenyan girls, the Elimu Yetu Coalition (2005) cited domestic chores as a significant source of girls' after-school time poverty. The combination of Nancy, Lupita, and Ayesha's resource-based agency given the structures they had to navigate after school meant they had to assume a triple burden, a concept which Moser (1992) initially conceived to describe women's time poverty but we see here is equally applicable to what girls experience. In this study, the

girls' triple burden consisted of the need to be a full-time secondary school student, contribute to domestic labor, while also performing care work in the home after school.

Part of the difficulty some girls faced in naming their own resource-based agency constraints with respect to time, as seen by the dialogue with Wangari, is that they struggled to distinguish between things they did after school because they made a choice to do them as opposed to having been inculcated by adult stakeholders at home on the gendered performances they were expected to give (Nomlomo, 2013). This contributed to why the girls did not seem to question or otherwise critically examine how their world was constructed before we conducted the resource portfolio card game together. Moreover, as seen above, when time was in short supply, Gertrude and Susan compensated for this by making trade-offs with the time they needed to sleep. Doing so enabled them to carve out study time in the morning before school. They gained time but the trade potentially impacted on their health, another key resource. Bardasi and Wodon (2009) propose that because time is a limited resource, people who experience time poverty may sacrifice the things they need such as rest and/or leisure in order to obtain other things.

#### 6.3.2.2. *School's Influence on the Time at Home After School*

As awareness grew of the impact that time had on their agency after school and at home, during other research activities the girls began to express challenges to the reasons why their time burden was so substantial. We even saw challenges in this area from NDSS school personnel. In May 2014, NDSS teacher and Head of Academics Paul Mwangi approached me on his break to tell me that he had raised the topic of the heavy workloads many learners faced at home after school at that month's Parent-Teachers Association meeting. He stated:

**Researcher's diary entry May 15, 2014:** *If we could get the parents to see how providing more time to the girls after school can enhance their daughters' learning, we could really see a change of fortunes here [with their academic work].* Conversation between myself and Paul Mwangi during a school break.

While Paul displayed concern for the learners, and surely had good intentions with the hope to address the lack of time girls faced after school and in their homes, his comment and reaction was surprising since some time-constraining tasks were also expected of the girls at New Day Secondary School. I will now provide an example of this.

Each day, the NDSS student population was made to clean the school grounds after school, including washing dirty surfaces, picking up trash, and performing gardening tasks. Although it was positioned as an activity to help instill school pride and discipline, the time spent performing school maintenance work was time the girls might have otherwise spent using books from the library, or undertaking further leisure or educational activities. The

message transmitted by having the girls perform this task after school would appear to conflict with what Paul wanted the parents and guardians to do at home (provide more time for the girls' studies) since he and his colleagues were contributing to the same norms on how the girls could use their time after school, and in a limiting fashion.

In this context, Paul developed a perspective based on an uncritical examination of the girls' lives outside of the official school hours between 7:30am to 3:30pm. Yet, this perspective did not demonstrate his recognition of the agency-constraining influences derived from the after-school hours at school, and to which he also contributed. Examining education delivery in light of existing government policies across three education sites in Kenya between 2007 and 2011, Unterhalter, Yates, Makinda, and North (2012) found that the people involved with schooling, including educators, can play a role in the replication of inequalities which contribute to children's marginalization. Through the reality elaborated, and the assessment of this reality, Paul essentially expressed a belief that the NDSS borders formed boundaries where, outside of its walls, inequality was rife but inside, no such inequality existed. His apparent inability to acknowledge how the structure of the timetable at NDSS after school was itself a source of unfreedom when viewed from a temporal angle shows once more the power that school as an institution to normalize routines, and through this impact, on the girls' lives.

#### 6.3.2.3. *Time for After-School Mobile Use?*

Continuing my exploration of time and agency after school while the girls were at home, in April and June 2014, I conducted FGDs with the 22 research participants. Through this research method, I asked directly about whether the girls experienced time-based norms associated with when and for how much time they could use their mobile phones after school. The responses highlighted that the girls were given several different temporal parameters to navigate:

##### Quotes from the March 2014 FGD

*I can't use my phone past 10 or 11pm in the evening.* Damaris

*Any time I am supposed to be going to sleep, I can't use it.* Everlyne

*I cannot use it when we are eating.* Nancy

*When I am out of school [during school break], and on weekdays my mom lets me use my phone from 8pm to 10pm.* Leanta

##### Quotes from the June 2014 FGD – after the introduction of biNu and Worldreader

*My uncle only wants me to use my phone on weekends because he thinks I will be distracted.* Linda

*I still only use [the phone] on weekends. This is because of the school volleyball tournament. I come home late, am tired, and may have clothes to wash, so I can't do anything else. Marie*

*I stay with my aunt for now. She doesn't give any attention to me, so she doesn't mind anything I do. Gertrude*

In the quotes above, we see that before and after the introduction of biNu and Worldreader, the structuring of time for when the girls were permitted to access and use their mobiles appeared to remain unchanged. Both Linda and Marie comment on the fact that the timing of their mobile appropriation had held almost constant, albeit for different reasons: In Linda's case, her uncle exercised control over her access to her device, and held the belief that her use of this material resource during the weekdays would negatively affect her education. For Marie, it seems that the amount of time that she used her mobile phone did not change, but the days of the week the use occurred did because of extracurricular activities that restricted the time available to her.

We see here that the parents' and guardians' discourses with respect to their daughters' after-school time positioned mobile usage as a 'time-wasting' activity that made it difficult for the girls to concentrate on their education. Yet, in refutation of the remarks from Paul earlier in this sub-section, we see that the parents and guardians also considered other aspects of the girls' well-being and agency (particularly their health, and their need to sleep and eat) when creating and applying the norms for how their daughters should spend the after-school hours at home. In broadening the understanding of how time is framed at home during after-school hours, undertaking a holistic analysis once more surfaced a finding that otherwise might have gone undetected.

### 6.3.3. Mobility and After-School Agency at Home

With the influence of time elaborated, I will now consider mobility and its impact on the research participants after school. The girls did not select mobility directly as a factor that affected their education. This is because it was not one of the 11 resource-based agency components named by Kleine (2013), and so was not depicted. However, their mobility was based on geographical resources, health, and time to move. The girls' mobility – or lack thereof – in turn exposed them to place-based norms instituted by their parent and guardians during the after-school hours at home. Accordingly, through analysis of statements the girls made primarily about geographical resources but also occasionally to time when this activity was implemented, I will show how the resource portfolio card game helped me identify mobility as a challenge faced during the after-school hours at home. We will see that the geographical resource constraints indicated that there were some places

the girls could choose to engage in learning activities after school and others that were inaccessible to them.

When the resource portfolio card game was conducted in May 2014, the Intervention phase had been underway for just over one month. For the 22 girls who believed their geographical resources affected their education, three specifically referred to time and the distance they lived from school in relation to this resource:

*I live far, and if there is a traffic jam, by the time I get home, it is late. And I can get a punishment.* Mercy

*I come from a distance. But since my parent has sacrificed herself to send me to school, why shouldn't I sacrifice myself to go the distance?* Ann

*Because I stay far, I ride a matatu home. The journey takes one hour in the evening. It costs 30 shillings to Kariobangi South.* Beryl

In the quotes above, the girls acknowledged that where they live in relation to NDSS (geographical resources) meant that they had a long commute home (time) after school. In Mercy's case, if the time she spent commuting took longer than anticipated, she could receive a punishment from her parents because they might suspect that she had been engaging in mischief (e.g. fraternizing with boys). Mercy did not specify the punishment or why her parents would give her the blame for this under the circumstances since she was reluctant to discuss this in front of her peers. However, her case illustrated how norms on the usage of her time with respect to the spaces she traversed after school was monitored to ensure there were no inexplicable deviations from the designated path.

Beryl linked her long after-school commute to the financial resources required to make the journey. The cost of 30 KES (US\$30) undoubtedly presented an additional cost to school attendance. This trade-off between financial resources and time would have increased the burden on her family to keep Beryl enrolled as these costs accumulated. Ann painted her long distance from school as a sacrifice she made because her mother enabled her educational access. She did not appear to view this lack of geographical resources as a negative constraint; rather, her ability to persevere and cope with it (psychological resource) demonstrated her appreciation for the opportunity to attend school.

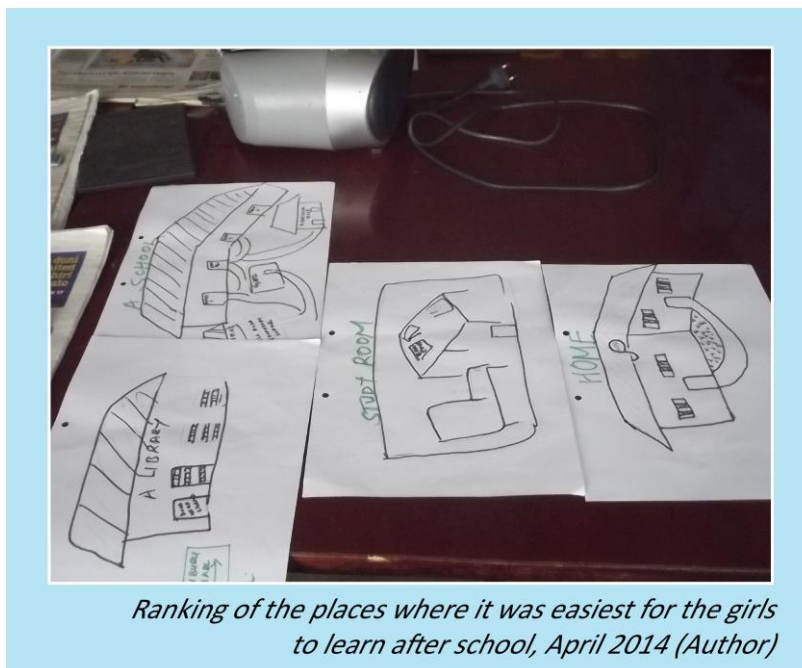
Researchers who have examined school day commutes in Global South contexts have indicated that the journeys can be a source of significant constraint with respect to children's agency, partially because of the time needed to compensate for the lack of geographical resources (Porter, Hampshire, Abane, Munthali, Robson, Mashiri, & Maponya, 2010; Porter, Hampshire, Abane, Munthali, Robson, Mashiri, & Tanle, 2010). While a significant amount of time was spent commuting for all three of these learners, we also saw that Ann seemed to view the time she had to spend in travel as a necessary trade-off

to attend school. In making the journey despite the constraints it caused for her agency, Ann also suggested that she did it to express her appreciation to her mother for helping her remain enrolled in school. Ann's physical mobility experience pointed to the need for me to explore how the 22 research participants might attribute different values to their own journeys home from school because the journey could contribute to enhancing freedom(s) in ways that are unexpected (Ory et al., 2004).

#### 6.3.3.1. *Places to Learn After School*

After implementing the R&A activity three times during the study (see **Chapter 5** and **Appendix J** to review the steps for this research activity), it became clear that the number of places where the girls could travel after school, to study or do other things, was limited. Analogously, their ability to learn in these places also varied (see **Plate 6.6**). With few exceptions, home and NDSS were the sites most often named where learning activities could take place.

#### **Plate 6.6**



In this image from the first R&A session in April 2014, at the far left the school library and the school grounds were arranged to indicate that these were the places where it was easiest to learn after school. At the far right, home was designated the most difficult location where a girl could learn. Just over half of the research participants (13 girls) ranked the school library as the easiest place to learn after school, and it was also their preferred place to learn after school. This was because during the after-school hours at school, they could borrow books (material resources) and enjoy them with relatively few noise disruptions (a part of geographical resources):



*The library is my favorite place to learn because there are many books for revision. The place is quiet.* Beryl

*Because it's quiet. You can read any book there, they're educative.* Wangari

Home was ranked either second from the last or last in terms of the ease with which the girls could learn in that location because, as they explained, their homes were not conducive to studying since it was often too noisy and/or there were too many interruptions. These conditions affected their concentration (psychological resource), making it difficult to focus on their studies. This finding is commensurate with what was observed during a study Nyamweya (2013) conducted at a mixed public secondary school in Nyamira County in Kenya. The researcher illustrated that day students who did not board at school grappled with a lack of reading space, good lighting, and reading materials after school when they tried to engage in learning activities at home. She also noted that interference from family members and a heavy work load, particularly in the case of girl learners, impeded at-home study (ibid.).

#### 6.3.3.2. *Places to (Mobile) Learn After School?*

One last area I wish to examine is the rules that the girls said governed their mobile use in different places. During the FGDs held in April and June 2014, I sought to answer SRQ3: *How, if at all, do norms on the use of space affect the girls' mobile use to IATECAS?* To do this, I asked the girls if they had to follow any rules about where they could use their mobile phones after school. Here were some of their responses:

##### March 2014 FGD

*There is a rule that we can't talk when we are crossing the road.* Gertrude

*I can't use it in school, the library, or the mosque.* Ayesha

*In church. I don't want to be distracted from the words I am hearing.* Ann

*At home, I can't. When you are chatting and the messages are coming [...], your parents say 'switch off that phone, it is too much'.* Esther

*There are some banks that say that you should switch your phone off.* Lupita

*I cannot use it while walking because I will fall.* Zeituni

##### June 2014 FGD

*My dad makes the rules. I am not supposed to go out with my phone. I must leave it in the house.* Ada

*I can't use it in a sitting room or in a public place. I use it in my room when I use it at home. It is my decision to do this.* Lupita

*When I am walking on the road I don't use my phone because someone can grab my phone. It is my own rule.* Elaine

*When I am cooking, my mom tells me not to use the phone in the kitchen because I could leave the gas on until the food gets burned. Leanta*

The responses shared above illustrate a mix of parental control, self-regulation, and practical considerations which shaped the creation, enforcement, and impact of spatial norms related to the girls' after-school mobile use. Examining place-based notions of freedom related to after-school mobile use, in this study, 'mobile' learning normally meant using a mobile phone to learn at home or in some cases on public transport (see **Chapter 8** for further discussion). The learners themselves were rarely physically mobile when using the device, and often confined to just one place (home) where mobile use was never guaranteed to be permitted. I found that the combination of a material resource (mobile phone), geographical resources (mobile network coverage and a place of use), time, and financial resources (mobile phone credit) gave rise to a new functioning among the girls, virtual mobility. Nevertheless, the structural factors (e.g. norms on the use of time and space) that impacted on their physical mobility also impacted to a large degree on their virtual mobility.

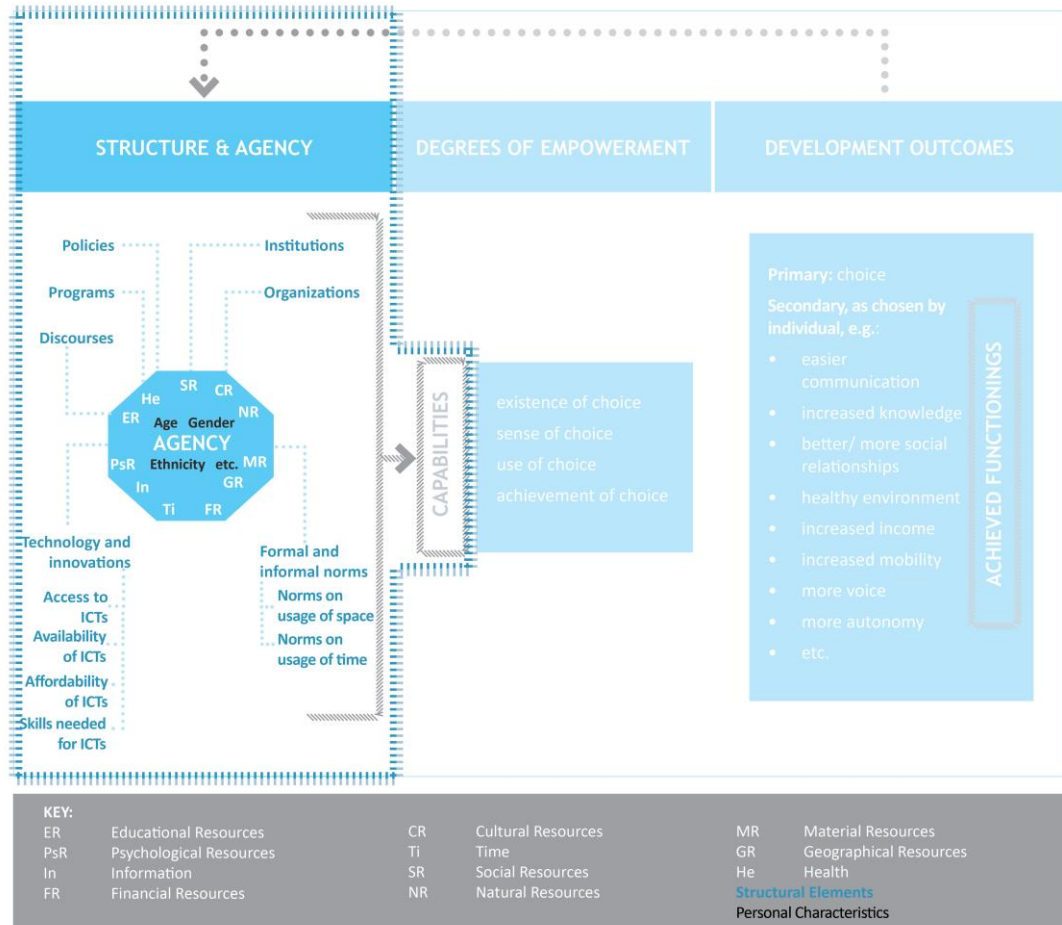
This is significant since many claims have been made in the academic literature on mobile learning that stress how mobile devices can facilitate learning 'anywhere and anytime' (Kukulka-Hulme, 2012; Sharples, 2013; Sharples et al., 2002; Wali, Winters, & Oliver, 2008; Zurita & Nussbaum, 2007). While a mobile phone (material resource and structural innovation) can indeed enable learning on-the-go, policies and gendered and age-based norms that some girls encountered during the after-school hours worked to ensure that they could not use their phones anywhere, anytime, or for any purpose. The ability to learn with a mobile device was also governed by the resources available to the girls after school. This raises the question of whether, in situations like those found at NDSS, mobile would enable virtual mobility as a real freedom to be enjoyed – or if it merely replicates the existing status quo under a digital guise.

In Chapters 7 and 8, I will delve into this point more deeply, particularly from the perspective of the girls' degrees of empowerment experienced during the study, and the realization of their desired development outcomes of having choice to increase access to educational content after school (primary), of grade improvements (secondary), and of achieving academic success (secondary).

#### 6.4. Conclusion

This chapter analyzed key structural elements and resources (see **Figure 6.2**) which impacted on the after-school educational experience of the girls participating in the study.

Figure 6.2



*Reimagined Choice Framework, structure and agency highlighted. Developed by the Author based on Kleine (2013)*

Given the pervasiveness of school as an institution, demarcating where the influence of school begins and ends cannot be done only for the period between when students arrive on campus and when they leave to go home. Rather, after school and in-school experiences are in continual dialogue with each other. Because of this relationship, I found that within schools, policies and norms – including those related to gender and age – were applied, reproduced, and likely mapped onto the learners (Ansell, 2002). Accordingly, this suggests that when interventions are conducted with a school population – even with an after-school hours focus – there is a need to explore school as an institution and its potential to influence people’s agency during this period.

Through the analysis, I observed how national-level policies, programs, and discourses influenced the research context at the micro-level by shaping actions and communications of the leadership, faculty, and staff at NDSS. This interface between structure and agency in the thirdspace designated as the “after-school hours at school” affected how ICT4E initiatives and mobile technology were valued by different adult stakeholders. The prevailing ideas of policymakers, school leadership, and teachers about girls’ after-school mobile use gave rise to discourses and norms on access to and use of

mobile technologies in this thirdspace. There were expectations communicated about how girls were supposed to use their time after school, and if they went online, how they were expected to behave in cyberspace.

Age seemed to be a powerful personal characteristic that remained a contentious point of discussion among NDSS faculty and the school principal with respect to the girls' agency during after-school hours. The debate about when the girls are old enough to appropriate mobile phones after school, for learning activities or otherwise, was also tied to gender because of the assumption made that young girls could be taken advantage of and that they require protection from pornography and boys when they are online. The adult stakeholders disagreed in terms of what they considered to be the ideal approach to supporting, and their views for when to initiate support of, the girls' mobile practices after school in a way that adults might view positively. Substantial structural challenges arising from the after-school hours at school were exposed and illustrated that the girls' agency in this context was limited in myriad ways.

I also unpacked how time was bound by space, and vice versa, after school and at home. Mobility emerged as a geographical resource, which in combination with health, time, and for some girls, financial resources to buy public transport, had the power to make possible or to close off opportunities to learn with ease during the after-school hours at home. Moreover, the confluence of geographical resources, place, time, and norms the girls were expected to follow shaped the girls' relationships to their mobile phones and their ability to use them after school.

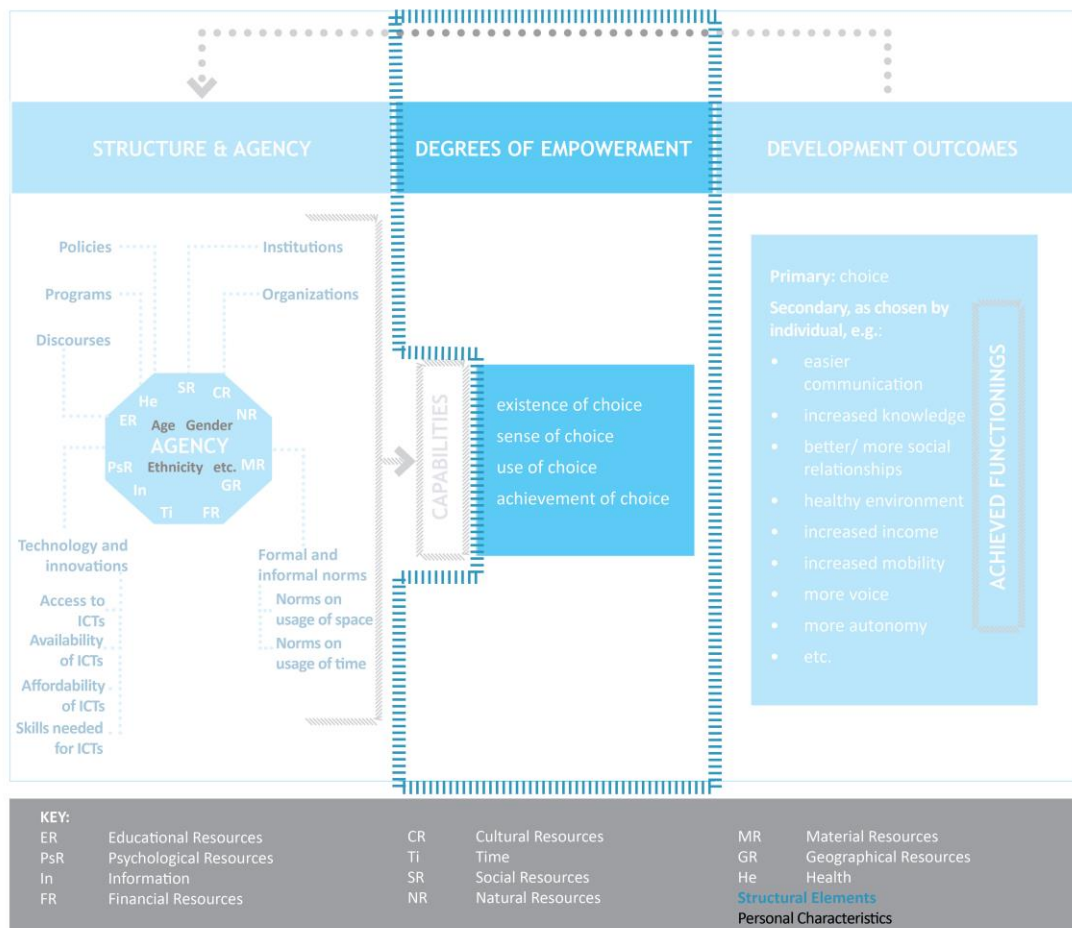
Investigating the after-school hours which occurred at home in this context was an important part of understanding what happened once I introduced the 22 NDSS learners to two new material resources/technologies: the biNu and Worldreader apps. Thus, after having examined key structural factors and resources, the focus will now turn to the degrees of empowerment, also referred to by Kleine (2013) as the dimensions of choice. In Chapter 7, I will deconstruct the girls' engagement with these technical tools after school. This will be done to assess insofar the data collected established that the girls were aware these choices existed after school, sensed they could use them, made use of them, and if this use matched the choice they expressed to increase their access to educational content during this period.

# Chapter 7: Differing Degrees of Empowerment in After-School Choice

## 7.1. Introduction

With the structural elements and resource-based agency components that frame this study elaborated in Chapter 6, I will now turn attention to analyzing the multi-dimensional conceptualization of choice in this capabilities-based education action research project. I will explore the girls' existence, sense, use, and achievement of choice as they sought to increase their access to educational content after school (IATECAS)<sup>22</sup> (see **Figure 7.1**). The aim will be to critically investigate if, and to what extent, the girl learners exercised choice in achieving their desired development outcome, and the degree to which they were empowered to do so.

**Figure 7.1**



*Reimagined Choice Framework, degrees of empowerment highlighted. Developed by the Author based on Kleine (2013)*

<sup>22</sup> I will use this acronym primarily in this chapter given the frequency with which it is referred to.

To start, I will define the four degrees of empowerment as understood through the lens of the Choice Framework. Then, I will contextualize the four degrees of empowerment for this study, including examinations of whether the girls experienced each degree of choice based on the data collected. Throughout this inquiry, I will also probe how and why time and mobility influenced the existence, sense, use, and achievement of choice as experienced by the research participants.

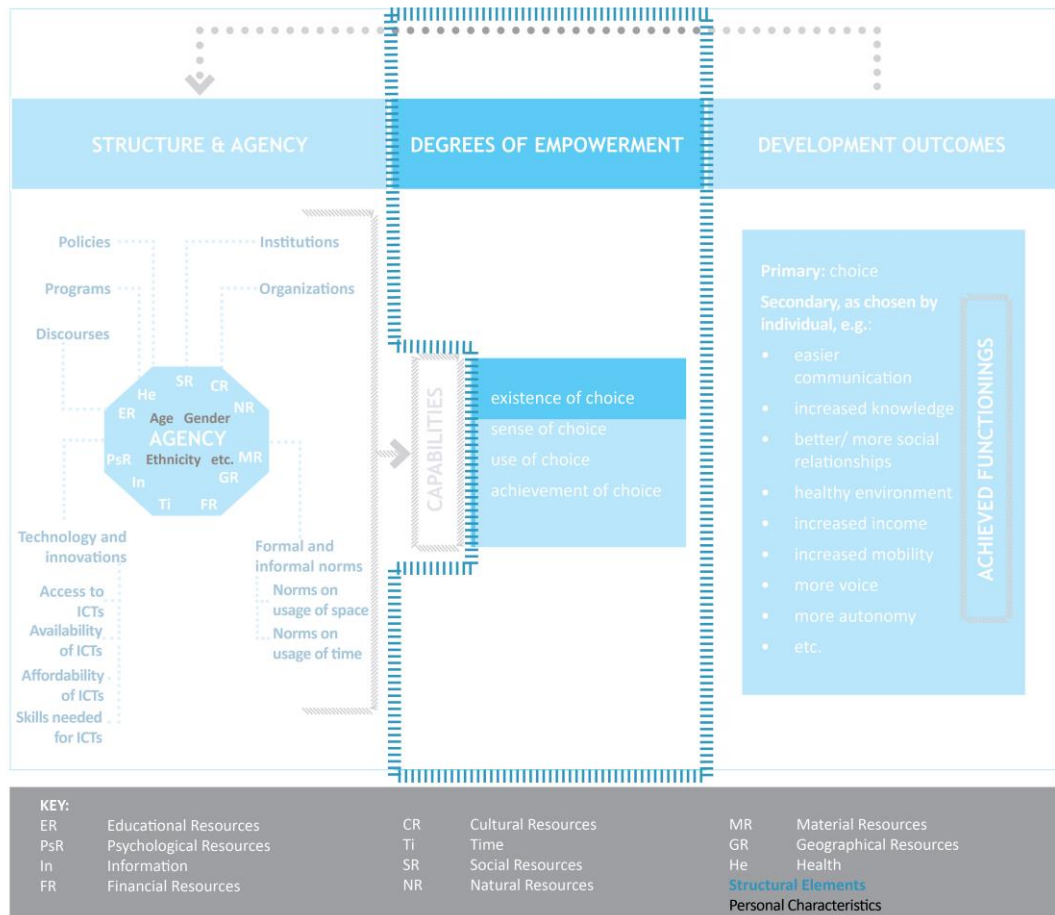
## 7.2. Defining the Degrees of Empowerment

Within the CF (Kleine, 2011a, 2013), the *existence of choice* refers to the availability of options or courses of action from which an individual may choose. A *sense of choice* is strongly linked to the existence of choice insofar as it is not enough for a choice to *exist* – rather, the individual must be aware of that choice *and* believe that she can exercise that choice. She must also view the choice as a reasonable means to achieve her desired development outcomes. The *use of choice* is when an individual exercises the choice(s) available to her, and is predicated on the existence and sense of choice. The fourth degree of empowerment, *achievement of choice*, is whether the choice exercised was effective in contributing to the individual's ability to realize her desired development outcome.

With this framing, I will now contextualize the degrees of empowerment for the 22 research participants. I will build on analysis from the preceding chapter with references to the structural elements and resource-based agency components identified since both factors are inextricably linked to the degrees of empowerment, particularly the existence of choice and sense of choice (Alsop & Heinsohn, 2005; Kleine et al., 2012).

### 7.3. Existence of Choice

Figure 7.2



*Existence of Choice highlighted, Kleine's (2013) reimagined Choice Framework Developed by the Author based on Kleine (2013)*

Data collected during the Pre-Intervention phase revealed that while different choices existed to facilitate choice to IATECAS with mobile phones (please see **Appendix L** for reference), the girls were not aware of biNu and Worldreader at the time this study commenced – even though both apps had been available for download in Kenya for at least a year. Yet, all seemed generally aware that they could go online and “google” to learn more information about a topic based on survey data in which they indicated having this skill or knowing this was a possible mobile-based activity. So, to an extent, they were already using mobiles to IATECAS. However, deeper analysis brought to light why this narrow type of educational phone use was predominant in the context, and how the existence of choice was influenced by the same factors which gave rise to this narrow use.

In response to the survey question “*What is the main activity you use your phone for?*” Ann wrote: “*To browse the net. To satisfy my curiosity on academia.*” In the same survey, Leanta responded: “*Doing research. Calling. Chatting.*” In the first FGD held during the Pre-Intervention phase, I asked the girls if they had ever used a mobile phone to learn something. One girl replied with a googling-related activity here, too:

*I have used my mobile to google names of diseases like meningitis. I used to use my cousin's phone for the dictionary. Zeituni*

There was no way for me to check if these were statements based on actions the girls had genuinely taken, or statements the girls made and which were influenced by the educational focus of this study (and associated social desirability effects). However, in a previous survey conducted with girls from each level of secondary school at NDSS, I found that the practice of googling for information was mentioned frequently (Zelezny-Green, 2014). Even after I probed further on these instances of IATECAS among the 22 girls, specific websites beyond [www.google.com](http://www.google.com), and specific actions apart from information searches, were not mentioned. This underscores that the existence of choice to IATECAS was not strong pre-intervention.

In their assessment of the existing links between youth and their mobile phone use for educational purposes, Porter et al. (2016) found that across Ghana, Malawi, and South Africa, there was a dearth of intentional and sophisticated educational uses of the technology beyond googling. This was in part due to: 1) the low level of functionality available on the youths' devices, 2) the predominant use of their phones was for social purposes, and 3) because the youth lacked awareness that the choice existed to access other educational tools by mobile. Many barriers that Porter et al. (ibid.) identified were mirrored at NDSS, with a lack of awareness of the diverse means to IATECAS closely followed by the low functionality of the research participants' mobile phones (material resource) as two of the biggest barriers to existence of choice observed during the Pre-Intervention phase.

The lack of awareness about the existence of choice was further stymied in the NDSS context by the girls' parents and guardians. Through discussions with the girls that were part of formal research activities, and others that occurred spontaneously while I was embedded in the school community, they related instances that suggested that their parents and guardians' attitudes (expressed to them as discourses) towards their daughters' mobile phone use, and the norms to which parents and guardians expected the girls to adhere, were not always encouraging. In the January 2014 survey, Question 26 asked the girls if they were always able to use their mobile phones when they needed to. The responses shared begin to reveal the significant challenges the girls faced to existence of choice in this area:

*My parents are very strict. They do not like seeing me using my phone during school days. Susan*

*Because my parents take my phone during school days. Esther*



*My sister doesn't want [me to use the phone whenever I would like to] because I will misuse my time. Linda*

Some of the parents and guardians also enforced norms on time use after school by making Mondays through Fridays off-limits for mobile phone use when school was in session. If the girls' parents or guardians told the girls that their phone use could be distracting or time-wasting, and limited when they could use their phones, in the language of the CF, they were shaping the structure of the girls' lives by creating influential discourses and implementing agency-constraining norms on the availability of their mobile phones. The discourses in particular could have also created worry (psychological resource) among the girls that made them limit their own mobile phone use if it was thought that it would be upsetting to their parents or guardians.

A joint study on adolescent mobile use in Kenya by UNICEF/InterMedia (2013) found that, among their population of 152 research participants, those who lived in poor, urban neighborhoods (similar to the ones where NDSS learners lived) were more likely to have parents or guardians who exercised a great degree of control over their interaction with mobile phones. The impact of this phenomenon was described as follows in the UNICEF/Intermedia report:

Young people say the lack of understanding about the digital world makes parents fearful and worried about the negative impact it might have on them. It can lead them to control their children's behavior even more. Parents often control their children's digital use because they say it will distract them from their studies or ruin their character. (2013, p. 4)

The report goes on to note that youth can grow upset or frustrated with their parents and guardians when they try to control their mobile use; some youth even stated that the adult and/or older person control they experienced made them more attracted to mobile use, and that when they used it, they felt compelled to hide the activity from their parents and guardians (ibid.). If NDSS parents and guardians created the same norms as what were seen in this report (as the girls' statements suggest), we see here that this restrictive behavior could have inadvertently increased the girls' degree of empowerment related to the existence of choice for educational mobile uses by stimulating their curiosity (psychological resource) given the restrictions. It can therefore be supposed that the girls may have felt worry and/or curiosity through their engagement with their mobile phones after school in light of their parents and guardians' norms.

Nonetheless, because the girls had insufficient time after school to allocate to developing skills needed to have the choice to IATECAS given the norms created by their parents and guardians, and in addition to their lengthy school day responsibilities (please see **sub-section 4.3.5.** and **Chapter 6** again, for reference), the lack of time as a resource

likely contributed to the very narrow initial phone use for educational purposes I observed. Echoing findings among impoverished youth in the U.S. (L. Robinson, 2009), the resources available in the girls' households could have also meant that their mobile use was primarily enacted for purposes thought to be more practical and a more efficient use of limited (especially financial) resources. With this confluence of barriers alone, it can be understood why the existence of choice to IATECAS had not been established by the Pre-Intervention phase.

However, these household-level structural elements and resource-based agency components were not the only barriers the girls faced to recognize the existence of choice. A lack of material resources, namely the types of phones the girls owned, were also problematic: In February 2014, I examined the phones the girls owned to assess functionality, and if there was any educational content installed. Of the 22 research participants, a total of four owned smartphones, five had feature phones that could access the internet, and 13 had either basic phones with just SMS and calling functionality or feature phones whose internet functionality was non-operational. The smartphone and internet-enabled feature phone owners did not have any overtly educational apps installed on their devices, but apps like Gmail and Facebook were present. Those who had basic phones that were unable to go online also did not have any apps or access to content that could be considered educational.

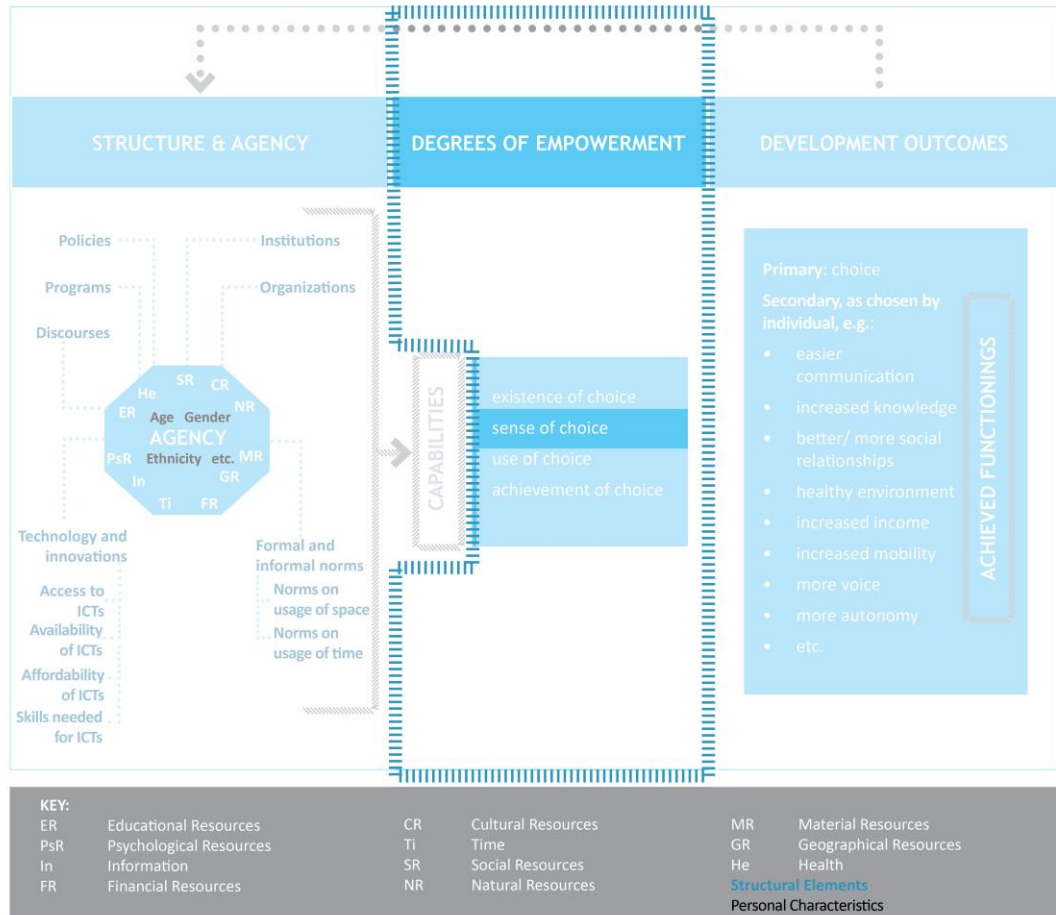
Even though nearly half of the research participants (nine) owned phones with functionality that could support their desire to have choice to IATECAS, apart from googling, there was no evidence that their devices were being used in more sophisticated manners. It therefore appears that, to varying degrees, existence of choice to increase access to educational content after school was extremely limited among the participants, irrespective of the type of device they owned. This adds further support to Porter et al.'s (2016) and UNICEF/InterMedia's (2013) findings that people in some sub-Saharan African countries are unaware of the myriad ways that mobiles can be used to access educational information. This situation, in light of the findings above, is worsened by the lack of content that is digitized and made mobile-accessible in this part of the world (Jantjies & Joy, 2015; Traxler & Vosloo, 2014).

At the very end of the Pre-Intervention phase, I initiated action to address the girls' lack of the existence of choice to IATECAS. When I gathered all 22 research participants for the introductory workshop to introduce them to biNu and Worldreader the first week of April 2014, they were vaguely aware that I intended to show them how to use their mobiles phone to access educational content. By the workshop's conclusion, the research participants became aware of the existence of biNu and Worldreader, thereby exposing

them to the existence of a new choice that might help them realize their desired development outcome for the lives they had reason to value (Sen, 1999).

#### 7.4. Sense of Choice

Figure 7.3



*Sense of Choice highlighted, Kleine's (2013) reimagined Choice Framework Developed by the Author based on Kleine (2013)*

By the conclusion of the Pre-Intervention phase, the existence of choice had been established with the introduction of the biNu and Worldreader apps. The girls then had to explore if this opportunity to have choice to IATECAS with biNu and Worldreader was something they thought they could actually make use of – in other words if they could be empowered to develop a *sense of choice* to use the proposed solution. Here is where the confluence of structural elements and resource-based agency had the greatest potential to affect the outcomes of this education AR process, particularly where the girls' psychological resources such as confidence and educational resources such as skills to use the apps were concerned.

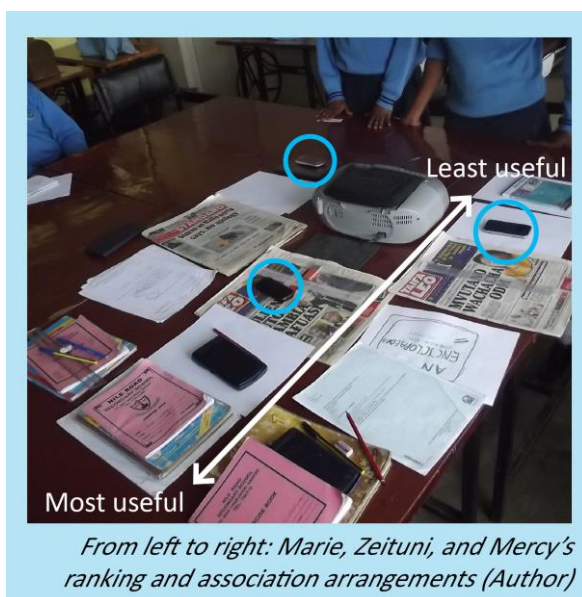
As defined earlier, an individual has developed a *sense of choice* when she is aware a choice exists and views the choice as one she can actually attain given her resource-based agency and the structure through which she must navigate. With the state of secondary school girls' education and participation in Kenya (Juma et al., 2012), the social status of

girls in the country (Jewitt & Ryley, 2014), along with extant discourses on youth mobile use (Caribou Digital, 2015; iHub Research & Research Solutions Africa, 2012; UNICEF/InterMedia, 2013), I anticipated that the sense of choice to IATECAS would not be as easy to positively influence as the existence of choice. Because participation in the AR process meant that the girls would be using their new material resources (biNu and Worldreader) to navigate a structure which was relatively hostile to such a pursuit, it was possible the girls might eschew the choice offered if they believed the barriers were insurmountable.

To explore the girls' sense of choice and to understand whether they attained this degree of empowerment, I will share data gathered during the R&A activity. The R&A activity was implemented three times: in April 2014 at the start of the Intervention phase, in June 2014 two months after they had been introduced to biNu and Worldreader, and in January 2015 during the Evaluation phase at the study conclusion. This activity helped explore how, where, and with what frequency certain educational resources were employed during after-school hours (please revisit **sub-section 5.6.3.1.** for details on how this activity was carried out). The activity was selected to help answer: *Do the girls view the mobile phone as a tool to facilitate IATECAS? (SRQ1)*

When this activity was completed for the first time in April 2014, most of the rankings placed the mobile phone at or near the bottom in terms of its utility for learning after school (see **Plate 7.1**).

**Plate 7.1**



In **Plate 7.1**, the mobile phones are circled in light blue, and placement of these items closest to where the research participants were standing (top-right) indicates that they thought these tools were least useful for learning after school; the pink exercise books

(bottom-left) are the start of where the most useful learning tools were ranked: The girl furthest to the left (Marie) ranked the mobile phone least useful; the girl in the middle (Zeituni) placed the phone halfway between the highest and lowest perceived utility, and the girl at the far right (Mercy) ranked her mobile phone's utility one rung up from the bottom.

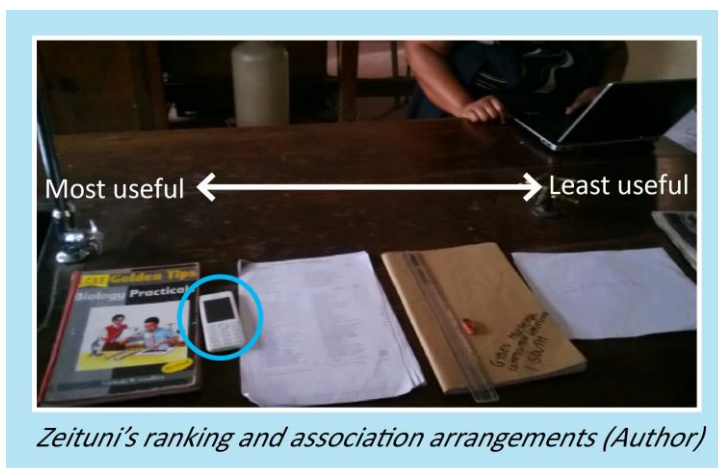
However, when the second R&A activity was completed in June, two months after the girls had been introduced to biNu and Worldreader, and had participated in four workshops and periodic face-to-face and mobile-based training on usage of the apps, the way these same girls ranked the mobile phone's utility changed significantly (see **Plate 7.2** to **Plate 7.4**).

**Plate 7.2**



*Marie's ranking and association arrangements (Author)*

**Plate 7.3**



*Zeituni's ranking and association arrangements (Author)*

#### Plate 7.4



In the three Plates above, the mobile phones are again encircled in light blue. The tools in the far-left area of the photos is where the most useful tools were ranked and the far right of the photos is where the least useful tools were ranked. Marie (**Plate 7.2**) and Zeituni (**Plate 7.3**) ranked the mobile phone as their second most useful after-school learning tool, a change from April 2014 when the mobile phone was second from the bottom and in the middle for each girl, respectively. Mercy placed her mobile phones in the middle. This was a change from April 2014 when she ranked it the least useful tool learners.

In contrast, in all three cases (as can be seen in **Plate 7.1** when compared to **Plates 7.2 through 7.4**), the girls' rankings of the newspaper in April and June 2014 did not change much. This indicated that this material resource was not very useful to support learning after school in their opinion at the start of the Intervention phase, and that this remained relatively unchanged even once they were introduced to the apps.

All 22 research participants' rankings of the mobile phone's utility as an after-school learning tool moved from a lower to a higher ranking within two months, though there remained variations in the level of perceived utility among the girls. When the R&A was conducted for the last time in January 2015, nine girls maintained their June 2014 rankings and 13 girls ranked the mobile phone higher still.

It is worth raising the possibility that the girls changed their rankings to indicate that the mobile phone had become more useful as a learning tool after school due to a perceived social desirability of doing so (to please me). Yet, because they knew this was a mobile-based intervention with the goal to help them increase their access to educational content after school in April 2014, they already had an opportunity to demonstrate evidence of socially desirable rankings when the R&A activity was first conducted. Nevertheless, I acknowledge that this method is not a way to gauge with absolute certainty if their perception of the mobile phone's utility changed because of this intervention. It does however provide some indications.

A sense of choice might also be conceptualized as the perception that people have about the options available to them, including the perception that the option is something they can practically choose to make use of. Researchers in the psychology discipline posit that there are influential relationships between perceptions, intended behaviors, and eventual goals attained (Ajzen & Madden, 1986; Dijksterhuis & Bargh, 2001). In international development and using the CA as a normative framework, Conradie (2013) and Conradie and Robeyns (2013) advance the argument that deliberate efforts to encourage people to work towards their desired development outcomes with the belief that they are attainable can positively change their perceptions about their ability to choose an option that can ultimately help them realize these outcomes. The R&A findings above suggest that the introduction of biNu and Worldreader positively shifted the girls' sense of choice: Once the choice was made available to the girls – and efforts were undertaken to make them aware of the choice and how they might appropriate the apps – their sense of choice about these tools as options to IATECAS exhibited progressive growth.

To triangulate findings on the girls' sense of choice, I asked them to comment on their ranking arrangements so that I could understand, in their own words, why mobile phones were ranked in the manner observed. Here are some comments from the April 2014 R&A activity, at the start of the Intervention phase and before the two apps were introduced:

*On a mobile phone, it is the least useful because someone may send you a message and you just reply instead of reading. It can have its own distractions. Elaine*

*Because when you're using a mobile, as you're revising, your mind won't be on the study but you will be thinking about chatting and going to Facebook. Shikoh*

*You've been given an assignment, [...] for example in history, you've been told to go and research. So, I use it [her mobile phone] for researching. I use it once in a while for this purpose. Halima*

Elaine and Shikoh ranked the mobile phone as the least useful tool for learning after school in April 2014, while Halima ranked the mobile phone halfway between most and least useful. Elaine and Shikoh highlighted in their responses that social uses of mobile phones could create distractions for the young learners, similar to the feedback parents made in the UNICEF/Intermedia (2013) study – and the comments teacher Sarah Kibere made in sub-section 6.2.2. in the preceding chapter. This is indicative that parents', guardians', and even teachers' perceptions of mobile phones could have influenced the girls' perceptions of the tool and their sense of choice to use their phone as a learning tool after school since, as discussed in Chapter 3, parents and guardians often impact their children and their ability to lead lives they value in a manner that they choose for themselves.

Additionally, because Elaine and Shikoh ranked past exam papers and their textbooks higher than their phones in April 2014, it can be inferred that this was due in part because these paper-based learning tools prepared the girls for the exams to be taken during the academic year, and contained the content that would be assessed. As such, past exam papers and textbooks had immediately tangible value that might translate to academic success if used appropriately, whether this was realistic or not. In contrast, the mobile phone required more effort to understand its utility because the girls would have to know of possibilities to access educational content, have the permissions and time to use the content, and then apply this information to their learning pursuits.

Accordingly, Elaine and Shikoh likely believed that the tools already familiar to them should be used first to support their learning, with mobile phones viewed as secondary in terms of their utility – if not lower – given that their phones might not always help the girls pass the exams since the *exact* content they needed may not always be in biNu or Worldreader, or easy for them to locate even after being trained how to do so. This meant that a sense of choice to use their mobile phones, biNu, and Worldreader was also challenged by the reality of an education system that prioritizes content which teaches to the test instead of encouraging more dynamic methods of knowledge acquisition.

On the other hand, Halima’s initial sense of choice was wider, but her comments highlight that the frequency for which she used her mobile phone to IATECAS was only enacted on an occasional basis. This implies that her mobile phone was not a tool that she perceived to be useful for these purposes as often as other after school learning tools – at least in April 2014. Halima also indicated that she ranked her textbooks books and past exam papers higher than the mobile phone because these tools contained the information she needed to prepare for her exams.

During the June 2014 R&A activity, I documented increases in the sense of choice held by all three learners: Elaine and Shikoh moved the mobile phone up four places from being least useful, while Halima moved hers up two places. When I asked each of these girls which tool they wanted to use more to learn after school and why, they stated:

*The mobile phone because it’s easy to use it. Elaine*

*The mobile phone because it’s just like the computer – I can search the things I want to and get anything. Shikoh*

*The mobile phone because I can use the mobile phone to learn anywhere, even when I am on a matatu. Halima*

Elaine and Shikoh previously viewed the mobile as a distraction, but just over two months later they wanted to use the device even more to IATECAS. This is not to say that they no longer believed the mobile phone can be a distraction, but that they had begun to sense



that the device could be used in a positive manner where learning after school is concerned. Moreover, as suggested by the language used in their statements above, their sense of choice about using their mobile phone to IATECAS changed positively along with their skills: Elaine and Shikoh's increased confidence (psychological resource) (as evidenced by their remarks "it's easy;" "just like the computer") probably contributed to their ability to further develop their mobile literacy skills. Having better mobile literacy skills undoubtedly would have strengthened their sense of choice to IATECAS using their mobile phones, and the biNu and Worldreader apps as media for doing so.

Halima's statement highlighted a degree of increased awareness about where her phone could be used as an after-school tool to IATECAS. A few learners revealed during the Pre-Intervention phase that they used their mobile phones in church (including to read the Bible online), at friends' houses, in cybercafés, and even in school (!). However, in this phase, it eventually became clear during the first six weeks of after-school participant observations – and through the comments made during the R&A activities and FGDs – that most after-school mobile use occurred in the girls' homes, bolstering the evidence uncovered in Chapter 6.

However, just two months after the Intervention phase commenced, it appeared that mobile phone appropriation to IATECAS was in some cases occurring even in transit, once more surfacing the mobility theme in the findings. The change in Halima's sense of choice about how she used her mobile phone and where she used it is significant because it contributes to evidence found elsewhere of people using mobile phones to facilitate learning on-the-go – but only when norms on the use of space make this possible. Wali, Winters, and Oliver (2008) also point out that as mobile learning definitions shifted from focus on the device's mobility to the learner's mobility, there was also a shift in the types of learning possible with phones and the places where this learning could occur: "These definitions diverted the focus from the technologies used to the mobility of the learner and the context of usage that extends learning to informal learning settings," (p. 44).

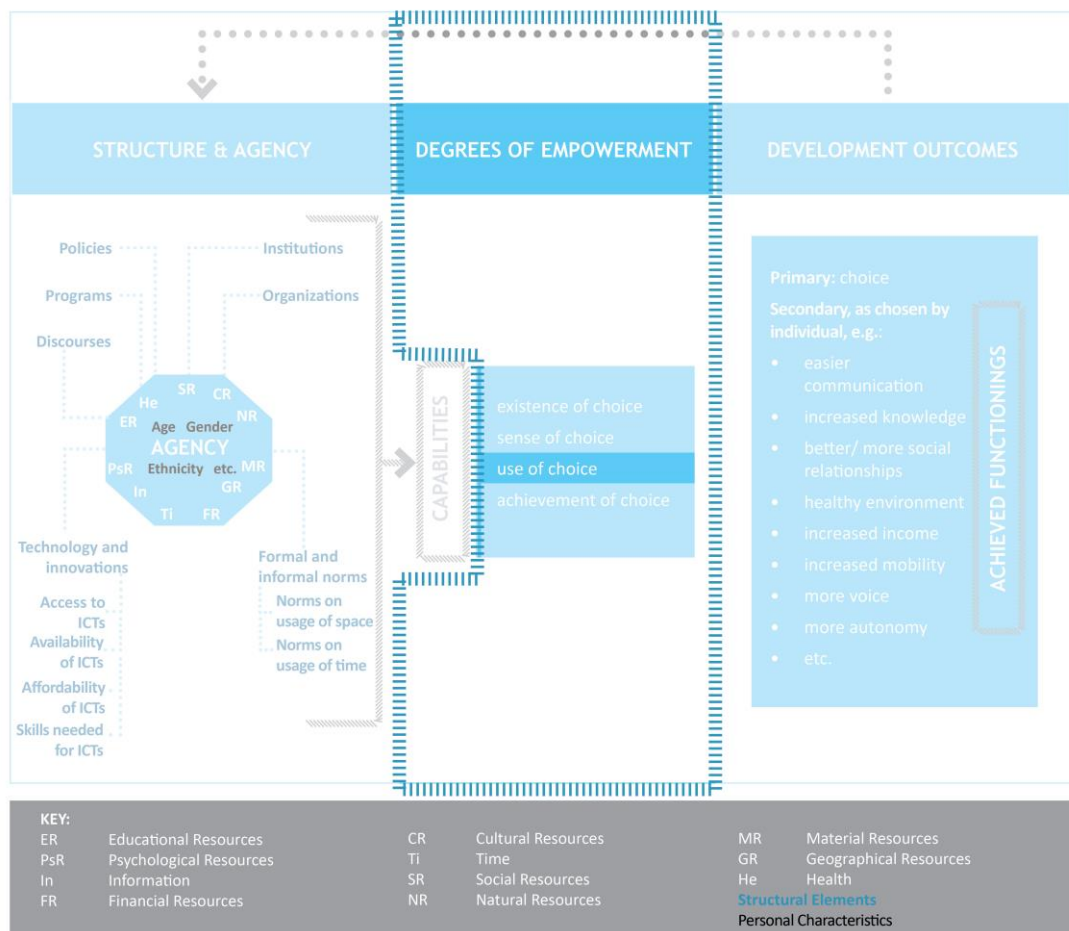
Halima's comment also indicates that after the introduction of biNu and Worldreader, she had used her phone to transform what might be considered 'dead time' in transit to a period when she could do something she valued. While using the apps while commuting by *matatu* could be challenging given there is often loud music playing in the vehicles and people chatting, this activity still provides a choice for girls to take control of their time and to make it useful to them in a different manner. Halima's remark about her desire to use her mobile phone more often to IATECAS during commutes illustrates that her sense of choice was to a degree increased by the realization that she could alter her

physical mobility experience to give rise to a new possibility for leading a life that she has reason to value.

All the girls whose data was analyzed in this section were aware of a choice to IATECAS with biNu and Worldreader. As time passed, they came to have a sense of choice that they could use their mobile phones and the two apps to IATECAS. Establishing a sense of choice was perhaps the most important component of the AR strategy for this study because if the girls never came to believe that using biNu and Worldreader to access educational content was something they could actually do, then it is almost certain that their app usage would have been negatively impacted. As shown earlier, augmenting the girls' confidence (psychological resource) in part through mobile literacy skills development (educational resource) was then an essential step to help them sense that they had a choice to realize their desired development outcome given the educational technology tools introduced.

### 7.5. Use of Choice

Figure 7.4



Use of Choice highlighted, Kleine's (2013) reimagined Choice Framework Developed by the Author based on Kleine (2013)

Once existence of choice was established with the apps introduction during the Intervention phase, I began mobile data collection. This was accomplished primarily by

aggregating the girls' mobile apps usage statistics into an Excel spreadsheet with the help of the biNu and Worldreader technical teams, and by manually documenting the frequency of relevant online behaviors observed. These behaviors included the girls' biNu message correspondence to me and the automatic, public status updates made by the biNu platform on the girls' activity walls when they finished reading a book on Worldreader.

As mentioned in Chapter 5, mobile app usage statistics were collected at three points during the study: after one full month of use (May 2014), after three full months of use (July 2014), and after eight full months of use (December 2014). This means app usage statistics were collected for nearly two thirds of the year, 237 days in total. I reviewed and analyzed the data collected during these three periods within a week of its receipt, using descriptive statistics. The first two collection points served as a guide to inform adjustments to the action strategy and subsequent actions taken to support the girls' ability to IATECAS with the two apps. For example, low use compared to others might indicate that a girl had yet to acquire sufficient skills for appropriating the tools, and high use might indicate that the girl was not the sole user of her device. My motivation for collecting mobile data was multi-faceted:

1. To add to the dearth of objective evidence on mobile use and outcomes in ICT4E interventions (Trucano, 2005);
2. To have data points to triangulate findings that emerged from the qualitative research methods, particularly those that involved self-reporting or explored the girls' individual use of their mobile phones to IATECAS;
3. To help answer the main research question: *How, if at all, might the introduction of mobile tools impact the girls' desired primary development outcome of having choice to increase their access to educational content after school?*

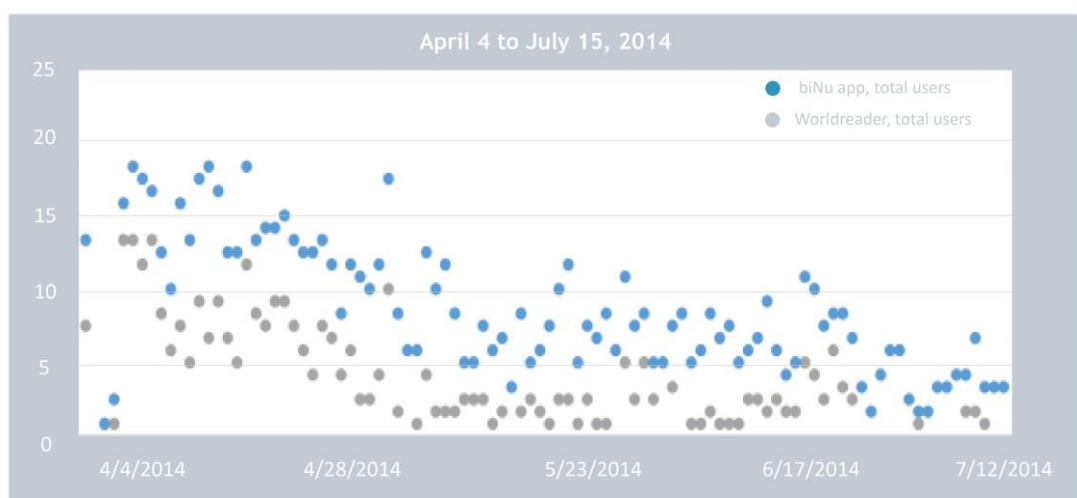
Using the mobile app usage statistics, it would also be possible to garner insight into the structural elements and resource-based agency components that might have played a role in shaping the girls' mobile use during the study.

To measure and discern use of choice from the app usage statistics, I looked first at all instances a research participant came online at least once to use the two apps between April 2014 and December 2014. With more than 230 days of activity to account for 22 people, to make the data set more manageable I excluded data from users who came online for fewer than five minutes on a single day during the eight-month period. For example, if Damaris came online for 10 minutes on May 1<sup>st</sup>, 2014 but only spent three minutes online on July 4<sup>th</sup>, 2014, her usage from May 1<sup>st</sup> was included in the analysis but her July 4<sup>th</sup> appearance was not. I did this because spending at least five minutes using the

app would help provide more data points to reference which could reveal patterns about how the apps were used and which content captured their interest most, as examples. There were ‘quick read’ books available on Worldreader that were short in length and curriculum-linked quizzes available through the BeSmart app on biNu that could be perused in five minutes or fewer. However, the five-minute length was applied as the standard minimum amount of time to help streamline the data analysis.

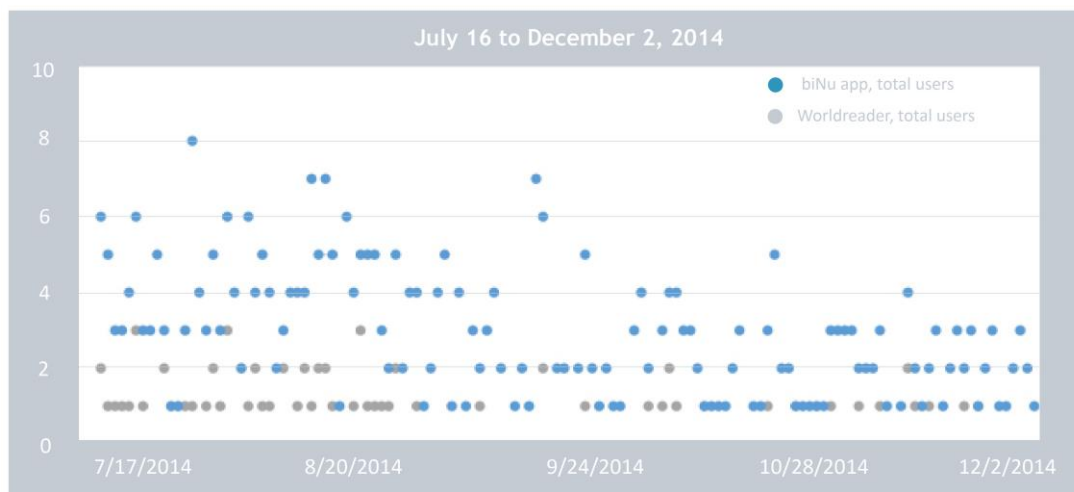
With these parameters for measuring use of choice delineated, I then worked to assess what, if any, daily usage trends emerged. To do this, I split the data into two periods: April 4<sup>th</sup> to July 15<sup>th</sup>, 2014 and July 16<sup>th</sup> to December 2<sup>nd</sup>, 2014. This was done to enhance readability of the app usage statistics. Next, the aggregate number of daily users was charted on the y-axis and the days that this usage occurred was charted on the x-axis. The aggregate number of daily users means that individual use was not represented in this process, but rather the activity of all users who came online for at least five minutes on a single day. This means that each day charted had a different mix of girls who appeared online. To make the chart more readable, I did not plot each of the 237 days along the x-axis, but instead demarcated the passing of time in 20-day blocks as the year progressed for the sake of achieving granularity in the visualization; testing other blocks of time such as monthly periods to create a visual representation that clearly reflected usage did not work well given the data volume. Furthermore, usage charted for the second half of the study required an adjustment to the y-axis in order to properly visualize the data and account for the drop in usage among research participants. **Figure 7.5** and **Figure 7.6** show the results of the app usage statistics based on this distillation.

**Figure 7.5**



*Daily number of research participants who spent more than five minutes on either biNu (biNu app, total users) or Worldreader (Worldreader, total users) during the period from April 4<sup>th</sup> to July 15<sup>th</sup>, 2014 (Author)*

**Figure 7.6**



*Daily number of research participants who spent more than five minutes on either biNu (biNu app, total users) or Worldreader (Worldreader, total users) during the period from July 16<sup>th</sup> to December 2<sup>nd</sup>, 2014 (Author)*

In the charts above, biNu and Worldreader usage in the first month after the apps were introduced was quite high: Each day at least half of the girls used biNu, Worldreader, or both apps once, and for five minutes or more. This level of activity was anticipated since research elsewhere has found that initial uptake in educational technology interventions, including those involving mobile devices, is often high because of the novelty of the experience (Sharples, 2013; Stockwell & Hubbard, 2013). However, other, more local factors also affected this outcome: For three weeks during the first month of use, school was not in session at NDSS because of the Term 1 break. This meant that the girls had at least eight hours where they could engage in activities other than attending school. While it was uncertain that the girls had the autonomy to decide how they spent this time, based on informal discussions with the research participants, it was clear that some would use at least some time to engage in preparatory work for Term 2. Other girls stated that they would be bored at home with nothing to do, while a few research participants shared that they would be traveling ‘upcountry’<sup>23</sup> to their ancestral homes to visit family. Despite these different experiences, it was likely that the opportunity to use technologies that were new to the learners drove a sense of excitement during this first month, raising usage levels.

A further explanation for the high level of use observed during the first month is that I supplied each research participant with 10 KES’ worth of phone credit (approximately 0.09€US) at the start of the Intervention phase. This phone credit, which was used to purchase mobile data packages for the girls, was a one-time contribution distributed to all 22 research participants on April 10, 2014. I provided these monies because I wanted to ensure that each girl had the financial resources available to make the choice at least once to use the two mobile apps if they wanted to. The amount I gave provided them with a

<sup>23</sup> The term ‘upcountry’ usually refers to places to the north, west, and east of Nairobi.

maximum of two weeks' mobile data use when the cheapest mobile data bundle of 5 KES was purchased, based on costs and bundles available at the time in 2014. Although I explained why I was offering this phone credit to the girls, I made it clear that if they did not want to use it to access the apps, they were not obligated to do so. I also informed them that they would receive no further phone credit for the remainder of the study.

My rationale for offering the financial resource once was because in addition to investigating if biNu and Worldreader might help the girls realize their development outcome to have choice to IATECAS, I wanted to ascertain whether the intervention was affordable for them, given their socioeconomic backgrounds. This would provide partial insight into the following research question: (SRQ6) *How, if at all, does the resource portfolio available to the girls affect their mobile use to IATECAS?* This question about the girls' resource portfolios includes whether they had sufficient financial resources (Kenyan shillings) to purchase mobile data (material resource) to use their phones and the two apps. Since nearly every research participant accessed the two apps more than once during the Term 1 break, I could reasonably assume that the influx of phone credit was an enabling factor for this usage.

An additional reason for the heightened usage between April and May 2014 was that, during the first week of the break, the girls requested and I organized three 1.5 hour-long workshops that any research participant was welcome to attend to help further train the girls on how to utilize biNu and Worldreader. They asked for more support because the four hours we spent over two days in the final week of Term 1 was insufficient to help them fully understand how the apps might be appropriated to IATECAS. All but three girls returned to school during the break for these training sessions; the three who did not attend had already traveled out of Nairobi by the time they were organized. Those who did attend came to NDSS in small groups of about six across the three days. This meant that the research participants had to gain their parents' or guardians' permission to journey from home to school and back, and then spend an additional 1.5 hours building their skills with me and Angela. The trek also underscored their strong desire to learn these skills. The girls' ability to do this suggests that they did experience an increase in the amount of free time available during term breaks.

Perhaps most importantly, these impromptu workshops surfaced evidence that the research participants were willing to negotiate the mobility to be able to journey between home and school during a period when such movement encountered resistance from their parents and guardians: Calls were made to Julie to confirm their daughters' intentions for returning to school during the break. This provided verification that despite having more free time, there were restrictions on when, where, and why the girls could move – even

when school was not in session. The girls' navigation of this structural impediment to their mobility showed, at least to some extent, that the girls knew a choice existed to IATECAS, sensed that this choice was available to them, and so they wanted to use the choice to increase their access to educational content after school if possible. Gaining permission to attend the trainings was one mechanism for doing this, but required a dialogue with their parents or guardian which might have exposed them to further questions or even negative opinions about their mobile use.

To summarize, app usage during the first month was undoubtedly bolstered by the girls having the know-how (educational resources), phone credit (financial resource), and increased confidence (psychological resource) to use the apps. These resources were further enhanced by their mobility negotiations (geographical resources and norms on the usage of space and time) and having additional time as a resource during the term break.

Nevertheless, as seen in **Figure 7.5** and **Figure 7.6** above, after the first month, the number of daily app users commenced a slow and steady decline. From April 2014 (when the Intervention phase was initiated) until about May 5, 2014 (when Term 2 began and the girls made a return to school), the average number of daily biNu and Worldreader users was 17 out of 22 girls who came online at least once a day and spent five minutes online. Once the school term started, and until June 30, 2014, the average number of daily users who spent five minutes online dropped to 12 out of 22 girls. In the period between July and December 2014, this figure fell to an average of four out of 22 girls who used the apps for more than five minutes on a single day.

While overall usage indeed dropped, as stated earlier, **Figure 7.5** and **Figure 7.6** are representations of the aggregate numbers of users who spent at least five minutes online using biNu and Worldreader each day; this means that different individuals are reflected in each of the data points plotted. For example, the usage statistics from October 3, 2014 show activity from Gertrude, Esther, Damaris, and Leanta, while October 30, 2014 shows activity from Halima, Susan, Gertrude, Damaris, and Wangari. When I carried out a granular breakdown of the app usage statistics, I noted that 16 girls continued to use the two apps throughout the entire period of data collection. However, their usage was confined to a couple of instances per week, or fewer. The six girls who did not use the two apps, or whose use was unable to be recorded throughout the data collection period, were: Beryl, Linda, Shikoh, Ann, Lupita, and Ada.

In Ann's case, she transferred from New Day Secondary School to another school in July 2014. This change likely meant several different circumstances prevented her continued use, although the exact reasons can never be known, since when I tried to contact her, her phone number had changed. Lupita lost her login password for biNu in

June 2014 and tried to get another SIM card so she could create a new account. However, for unknown technical reasons, she was unable to register her new SIM, and I no longer had a method for tracking her use even though she self-reported that she continued to use the app, but not as a logged in user. This was indeed possible since creating a user ID is not necessary to access and use the apps on a feature phone. Beryl, Linda, Shikoh, and Ada all experienced structural barriers, including norms on the usage of time and negative discourses about girls' mobile phone use, which halted their activity before the study ended. Due to space constraints, only Ada's circumstances will be addressed later in this chapter.

To triangulate the trends observed from the app usage statistics, I will now consider the use of choice observed during after-school participant observations I conducted from April to June 2014 with four research participants: Leanta, Lupita, Ada, and Gloria. Of these four research participants, only Gloria managed to exercise a high degree of control over their usage of biNu and Worldreader for IATECAS. Because of this, she was an exceptional case among the research participants, and I will analyze her situation first, before turning to some more common patterns.

### 7.5.1 Gloria's Use of Choice

During my observation in June, Gloria had uninhibited access to her phone: Her use occurred in her own small, separate one-room dwelling, located just steps away from her family's slightly larger shared home. She used the apps for 40 minutes while I was present, handing her phone to Angela to show her biNu messages and Worldreader content on three separate occasions. During the visit, her mother prepared dinner, and Gloria did not have many chores apart from preparing her school uniform for the next day and occasionally watching her younger brother.

Worth noting here is that during the observation, there was no electricity, and lighting was provided by solar lamps. Gloria's father stated that he had been out of formal employment for a while and was behind on rent, so he could not afford to pay the electricity bill. Gloria explained that she charged her mobile phone by paying a small fee at an informal stall in her neighborhood. The family's financial resources came from informal work in which Gloria's parents were engaged as market stall cleaners. However, these resources were not always sufficient, as evidenced by Gloria's occasional exclusion from school for non-payment of fees. Even still, Gloria had time in relative abundance after school, and used a combination of the resources she did have to exercise the choice to IATECAS.

Discussing the dimensions of choice, Kleine (2011a) states that "individuals use their resource-based agency to negotiate the social structure, constantly making choices



generally aimed at their notion of what kind of life they want to live,” (p. 124). In this case study, Gloria had constraints on some of her resources, but she had a mobile phone (material resource), it was charged, there was mobile network reception where she lived (geographical resource), and she had money available to buy mobile data (financial resource). Gloria’s home environment (geographical resource) also provided an enabling structure primarily constituted of the informal norms that shaped use of her semi-independent living space, how she could spend the hours after school (time and norms on her usage of time), as well as the availability of and her access to her mobile phone, biNu, and Worldreader. This combination of structural enablers and agency based on resources empowered Gloria to increase her access to educational content after school. That she decided to *use* her resource-based agency to navigate her social structure to IATECAS signified that this activity was part of a life Gloria had a reason to value.

### 7.5.2 Leanta’s Use of Choice

Despite running her own business selling *chapattis*<sup>24</sup>, Leanta’s mother apparently did not earn much money: their home – while constructed of concrete and wired with electricity – was still quite run down. It was comprised of four rooms: a small kitchen area, a living area that was divided to create a bedroom, an additional bedroom, and a small shower area. Upon arrival, Leanta first tended to her grandmother in the living room (care work). Then she washed dishes, before igniting a gas stove to begin cooking (division of labor). She put a large pot on the stove with beef she had purchased on our walk home together, before being called away by her mother to run an errand outside of the home.

Leanta’s older brother, a recent secondary school graduate, was home when we arrived, but performed no domestic work the entire evening. Instead, he socialized with friends, left home, then returned with two friends and a cousin to chat to me briefly. During this chat, her brother asked me in what I sensed was an aggressive tone:

**Researcher’s diary entry May 13, 2014:** *Dante, Leanta’s brother questioned me: “What is my sister using her phone so much for? Is she communicating with men? What is she doing?”*

I was surprised at her brother’s demeanor as he asked his questions since the research purpose had previously been explained to Leanta’s mother before the action research started<sup>25</sup> and permissions secured. Nevertheless, I explained what Leanta was doing and demonstrated the apps on my own phone to show that Leanta’s increased use was probably related to her desire to IATECAS. Though I think I managed to assuage Dante with this demonstration and explanation, his tone remained hostile.

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<sup>24</sup> A *chapatti* is a grilled flat bread which has Indian origins and is consumed in Kenya.

<sup>25</sup> Though perhaps not to him.

After this discussion, Dante's friends departed and Leanta served dinner to me, Angela, her mother, her brother, and her grandmother before joining us to eat. Following dinner, she began to wash the dishes before being sent once more to purchase something from a late-night market stall nearby. Upon returning she remarked:

**Researcher's diary entry May 13, 2014:** *"See, Ronda! How am I supposed to study? I keep getting sent away to do all these things."*

By the time I departed at 10:30pm, Leanta was just finishing chores and planned to do homework. During the observation, she briefly used biNu to check a message she received from another research participant, but then put the phone away to continue her chores. She did not use her phone again while I was present.

Although Leanta had some resources to IATECAS (mobile phone, apps, skills to use her phone and apps, mobile data, and network reception), the structure she had to navigate to make use of these resources presented a significant barrier to doing so. Leanta did not have much time to use biNu or Worldreader because of tasks for which she was responsible: Informal norms on the usage of her time after school delineated a gendered division of labor since her brother was not made to contribute to domestic work. In Kenya, low-income households often require children's contributions to domestic chores, and these contributions are frequently gendered (Moyi, 2011). For these households, the educational attainment of children who combine housework and school is lower than households with children who only attend school and do not have domestic work responsibilities (ibid.).

Additionally, because Dante was the only male figure in the household (Leanta's father had previously passed away and she had no other brothers) it appeared that he exerted a protective – and to a degree fatherly – influence over Leanta's activities during after-school hours and while their mother managed her *chapatti* shop. Dante's influence and maintenance of a patriarchal form of control over the females he lived with was so strong that he would later kick them out of the home they shared, causing Leanta and her mother to become homeless for a period. The reasons behind this will be explored further in Chapter 8.

Returning to data analysis from the participant observation in May 2014, it is plausible to believe that Leanta's lack of mobile use while I was present was not only because she had multiple chores and errands to complete but also because of the negative discourses (e.g. "Is she communicating with men?) and attitude Dante appeared to have for her mobile appropriation. These circumstances suggest that the structural elements Leanta had to navigate after school and at home constrained her mobile usage, time, psychological resource of concentration, and social resources she might derive from family

support. Because of this, the time Leanta could have used to increase her access to educational content after school was often diverted to maintaining the household and negotiating the gendered norms imposed by her brother.

### 7.5.3 Lupita's Use of Choice

Like Gloria, Lupita lived in a home with separate spaces: One was the main house with a living room that also contained her parents' bedroom. Then, there was a separate area connected by a short, muddy walkway where Lupita and her cousin Jeanette slept. Jeanette is also enrolled at NDSS and was in her first year of study while Lupita was in her second year. Jeanette lived with Lupita and her family because she had been orphaned at a young age.

To the left of the room Lupita and Jeanette shared was the kitchen area, which was enclosed only on one side. This compound was open plan, and occasionally neighbors passed through the walkway. On a tour of her home, Lupita showed me to the room she shared with Jeanette first, before dropping her bag and beginning to prepare vegetables to cook. Jeanette then led me to the living room area. Thirty minutes later, Lupita took me to her room and we sat as she used biNu and Worldreader for about 20 minutes. While doing so, she kept watch on the kitchen area, where Jeanette had taken over dinner preparations. Angela remarked that this was out of the ordinary since Jeanette almost never contributed to domestic tasks when she observed Lupita in February 2014. Even still, by the time of the May after-school observation, Lupita emerged as one of the most frequent users of both biNu and Worldreader, according to the mobile app usage statistics. For these reasons, it is difficult to say if on the occasion of my visit Lupita used her mobile phone and the two apps because I was there or because she was truly at liberty to do so.

After some time, Jeanette took me back to the living area and turned the TV on, and Lupita returned to the kitchen. Lupita later checked on me and Angela, and explained that we were waiting for her parents to come home before we ate. Her parents arrived at around 8:45pm. Because they both had formal employment near the Nairobi city center (her mother was a store assistant and her father was a maintenance man), their journey home was severely delayed due to a traffic jam. They told me in conversation that Lupita was the person responsible for looking after the house and the children who lived there, and for preparing dinner.

After we ate, both parents pulled out their phones to use them. Lupita's mother asked me if I could put the biNu app on her phone, since Lupita had previously shown her how it worked. This led to a spontaneous discussion about mobile use for learning and to IATECAS. Her parents said that they found the idea interesting but were skeptical until Lupita showed them the app. By May 2014, they said to me that they saw how it could be

useful and wondered if other Kenyan school textbooks were available through the app. Lupita then retrieved her mobile phone and began using biNu and Worldreader once more for approximately 30 minutes while Jeanette cleared away our dishes and returned to the kitchen. My discussion with Lupita and her parents continued until approximately 10:00pm, when I departed for the evening.

As seen in this case study, Lupita did not always have a lot of time after school because of household contributions her parents expected her to make. It was essentially a zero-sum game between herself and her cousin Jeanette: If Lupita helped around the house, she lost autonomous time while Jeanette gained autonomous time. The day I visited, Jeanette lost her autonomous time and Lupita gained nearly an hour of autonomous time to which she chose to use biNu and Worldreader. It is a difficult set of circumstances in that both girls should have time to themselves after school. But because Lupita is older than Jeanette, and Jeanette lost her parents so young, Lupita became the lead care-giver and homemaker when her mother was not home. This was a substantial after-school burden to carry. The situation is testament to just how resilient and persistent Lupita was to participate in education since she did not attend school any less than Jeanette while this study was conducted, and as mentioned earlier was one of the most avid app users. While her circumstances were not ideal, Lupita displayed perseverance (psychological resource) to work towards her desired development outcome. She also creatively managed her time to do so, as shown in a comment she made during a focus group discussion session in June 2014:

*For me it is not difficult [to use her phone and the two apps when school is in session]. I use most of my time after school and at school [on site at NDSS in the hours between 3:30 to about 5:45pm] doing my assignments so that when I go home, I can use biNu. Lupita*

In somewhat of a surprise to me, although Lupita occasionally missed school due to her parents' inability to pay her fees, she still used the apps consistently: Her individual usage statistics revealed that in the first two months of the study, she came online at least four times per week, and spent an average of 20 minutes online each day. This even though the 10 KES I gave all the learners at the start of the study would have been exhausted within two weeks. Her usage pattern can only be explained by the purchase of additional mobile phone credit for at least 5 KES since that was required to purchase the cheapest data bundle that provided light data usage for a week. Lupita's biNu and Worldreader usage to IATECAS, despite her resource constraints, was undoubtedly bolstered by her parents and the relatively supportive structure they created for Lupita in her home environment.

While the time and space informal norms linked to her age and gender constrained Lupita's agency, her parents' attitude towards the mobile use to IATECAS was positive and tolerant when compared to my encounters with other parents and guardians during the AR process. The positive discourses they shared about mobile learning and their daughter's use of mobile technology likely aided Lupita's ability to appropriate the tools when her parents gave money and Lupita had time to use the apps. Additionally, her parents had established an informal norm that Lupita could use her mobile phone at the family home and in her own room (geographical resource) when she was not participating in domestic labor, which accorded her concentration (psychological resource) to use her phone undisturbed to seek educational content. Moreover, her mother's desire to use biNu and Worldreader probably legitimized the mobile tools in Lupita's eyes and made her own actions more permissible after school, indeed augmenting further still her confidence (psychological resource) that using the apps was a valuable thing to do. This case refers us back to two points made in Chapter 3 about how a parent's capabilities has an impact on their children's (Biggeri, 2007), and is illustrative of how parents can contribute to helping their child make choices now that will enhance their future freedoms (Saito, 2003).

#### 7.5.4 Ada's Use of Choice

In comparison to the other learners observed after school, Ada had the shortest journey home. She was also free from completing any errands on the way there. Ada appeared to come from a household with more financial resources available; her home abutted a primary school, was constructed of concrete, wired with electricity, had running water inside, along with a well a few feet from the front door. When we entered her home, she immediately changed into her 'home' clothes. While she changed, I greeted her two sisters (one older and one younger) and her younger brother. I observed at least four distinct rooms: a kitchen, two bedrooms, and the living room. The living room contained a TV and a radio, both of which were turned on before our arrival.

Although Ada's household was a mix of a boy who was in primary school and 12 years old, and three girls (two in secondary school and one recently graduated), the division of labor observed among them was relatively egalitarian. The evening meal was the only area that the boy did not make domestic contributions where his sisters did. Even then, the eldest sister spent the most time preparing the food while Ada and the middle sister helped only sparingly. Otherwise, the three youngest siblings watched TV or listened to the radio when they were not preparing their clothes for the next day or making the house look tidy. Ada also occasionally used her mobile phone. When the time she spent doing domestic work was subtracted, Ada had at least two full hours per day to be used however she chose before her father came home from work. Whereas this time represents

just a sliver of the estimated 17 waking hours Ada had, it was still a substantial amount of time for any NDSS learner to have to themselves after school.

The TV was tuned to a Brazilian soap opera dubbed in English that captivated even Angela when it was broadcasted. While the show was on, Ada used biNu and Worldreader during commercial breaks and when she was not helping her sisters in the kitchen. The overall atmosphere in the home was relaxed during this period, and the siblings spoke to each other in a combination of their mother tongue (Luhya) and Sheng, often laughing. However, when the father arrived home at 9:00pm, the mood quickly changed. Almost simultaneously to me greeting Ada's father and without my initial notice, the TV and radio were switched off, and Ada's mobile phone disappeared. All conversation among the youth ceased and the sisters began to serve dinner in silence. The father was employed by Nairobi County and he apologized that his work had kept him away for so long.

During our discussion, the father asked how Ada was performing in school; he also asked about the action research. This exchange provided another opportunity for me to glean an adult's opinion of mobile use to IATECAS. The father remained what I considered to be neutral and did not express a strong opinion for or against Ada's mobile use. Instead, he asked questions about my work with NDSS more broadly. After we finished the meal, the remainder of the evening was relatively quiet apart from me and Ada's father chatting; Ada and her siblings worked in silence to clear the dinner table, wash dishes, and otherwise keep busy. I departed Ada's place at 10:15pm.

Afterwards, Angela revealed that on previous visits made to Ada's home, all technology in the house was also switched off or effectively disappeared when the father arrived home. Unlike Gloria, Leanta, and Lupita, Ada initially had no substantial resource barriers to her use of mobile technology to IATECAS: she had financial resources, geographical resources (proximity of her home to NDSS, and lived in an area with mobile network reception), material resources, and she had more time after school than her peers. But when structure is considered, Ada's father and his informal norms on his children's use of space, time, and their access to ICTs loomed large as a constraint. Although it did not seem as though Ada and her siblings were forbidden to use the various digital technologies they had at home, it was clear that their father's presence signaled a cessation of all ICT use. Once 9:00pm brought his arrival, space, time, and access to her mobile phone to IATECAS was effectively curtailed for Ada. If her father arrived home earlier, this could mean that Ada would have even less time to pursue this outcome.

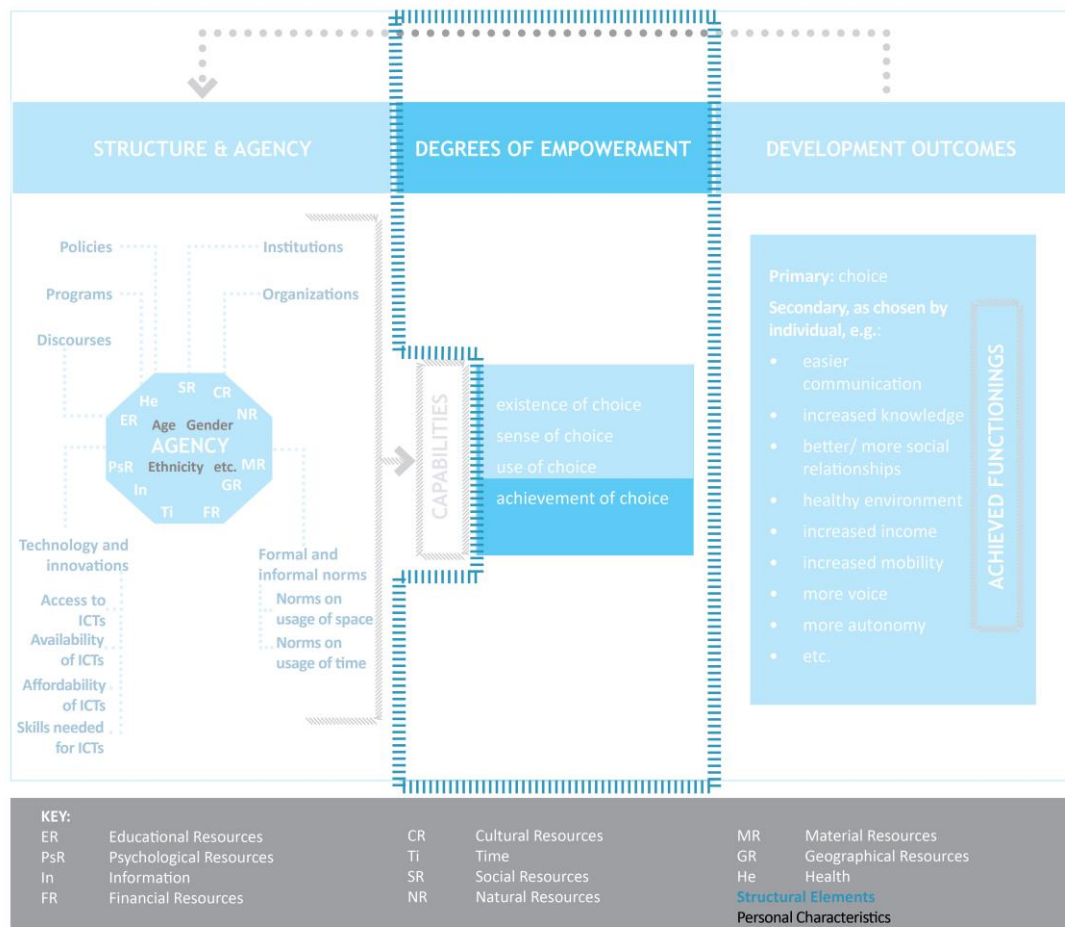
In mid-June 2014, Ada shared that her younger brother had taken her phone when I remarked that she had not been online much the past few weeks; Angela received the same response when she asked her separately. When I offered to speak to her father so

that the phone might be returned to Ada, she stated that she would be able to retrieve the phone on her own. Given that Ada did not appear online again for the remainder of the data collection period, it seems that her brother, likely with her father's knowledge and/or consent, used up the material resource Ada would have needed (mobile phone) to increase her access to educational content after school with biNu and Worldreader if she so chose. I never learned why Ada's phone was taken, and this was disappointing since she used the choice presented to her frequently in the first two months of the study. To add to the mystery, in early June 2014 her father attended a meeting for parents and guardians whose girls were participating in the study; he strongly supported Ada's continued participation. Furthermore, it was then for the first time that her father told me he thought this was a great intervention which helped his daughter access books. In hindsight, the father might have felt pressured because the other parents present expressed similarly positive views and it is possible that his true attitude towards what I was doing was probably quite the opposite given what I observed after school in his home.

The sum of this data highlights substantial nuances in the girls' use of choice to increase their access to educational content after school with mobile as a medium for this access. As these four case studies showed, the NDSS research participants come from very different home environments, even if many are from a similar socioeconomic background. These differences were due in part to the variations in resources the research participants had during the study. But the differential levels in the ability to IATECAS documented were owed not just to their resource-based agency, but also to the structural elements the girls had to navigate at home as they sought to lead lives they had reason to value. The girls I observed during the after-school hours seemed to be in positions of relative powerlessness in their households apart from Gloria. Use of choice was a complex undertaking, and unfavorable conditions for use almost always resulted in the girls' decreased use of the mobile tools, if not a stoppage altogether.

## 7.6. Achievement of Choice

Figure 7.7



*Achievement of Choice highlighted, Kleine's (2013) reimagined Choice Framework Developed by the Author based on Kleine (2013)*

In the preceding sections, I examined this education action research project using the Choice Framework, focusing on choice and the degrees of empowerment experienced by research participants in this study: *existence, sense, and use of choice*. Here, I will consider the final element in the four conceptualizations of choice, *achievement of choice*. Due in part to the challenge of applying the CF and engaging thoroughly with each constituent conceptual thread (more than 30), and given the tool's theoretical richness as a holistic operationalization of the capability approach to human development, other studies which have applied the CF (Coelho et al., 2015; Poveda, 2015) have not looked deeply into monitoring and evaluating the achievement of choice. Therefore, I will draw heavily on previous work from Kleine (2007, 2008, 2010, 2011a, 2013; Kleine et al., 2012) as well as from Alsop and Heinsohn (2005), who were two of the initial key theorists to detail what was meant by achievement of choice; Kleine's CF is based in part on Alsop & Heinsohn's work on empowerment. I will do this both to briefly explain this concept as well as to demonstrate how achievement of choice has been understood in their work, including an AR project Kleine co-conceived and implemented in Chile and India. Then, I will turn



attention to evaluating achievement of choice in this study with secondary school girls in Nairobi.

To help strengthen the effectiveness of organizations implementing projects with the goal of empowering poor people, Alsop and Heinsohn (2005) sought to delineate how these organizations might monitor and evaluate processes of empowerment and their associated outcomes. This included articulating three degrees of empowerment, the existence, use, and achievement of choice, which are examined in graduated steps, much like what has been done in this thesis<sup>26</sup>. Alsop and Heinsohn (2005) define the achievement of choice as “whether the choice resulted in the desired result,” or “...how far a person or group is able to achieve their desired outcome,” (p. 10). They offer the example of a Beninese woman who wishes to send her daughter to school. If the school exists, and the woman chooses to send her daughter there, then the achievement of choice is ascertained by whether her daughter attends the school. The authors also express the achievement of choice with an example of a woman who has an abusive husband. They note that this woman could get help from local law enforcement (achievement of choice) if she knows that she has rights and that law enforcement has a duty in this case to help her protect her rights (existence of choice), and she had lodged a formal complaint with local law enforcement to bring her situation to their attention (use of choice). Note that Alsop and Heinsohn do not include a dimension of “sense of choice,” which is something Kleine added later on.

In her PhD thesis, which first presented and applied the CF as a tool in ICT4D, Kleine (2007), building on Alsop and Heinsohn’s report, defined the achievement of choice as “...whether making the choice achieves the desired actions and outcomes,” (p. 62). Through a Fair Trade (FT) participatory AR project which focused on helping UK consumers make informed, ethical goods purchases by adding visibility to the supply chains of Chilean wine and Indian coffee production, Kleine et al. (2012) synonymize achievement of choice with the effectiveness a choice presents for a person based on their desired development outcome. For example, achievement of choice in their project was measured by reliance on “...the [FT] certification systems to work, but was aided by the specific information made available by the Fair Tracing system,” and is “is determined by how well the buying decision achieves the outcomes desired by the decision-making consumer,” (Kleine et al., 2012, p. 55).

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<sup>26</sup> Kleine (2007) added a *sense of choice* to the degrees of empowerment after analyzing the findings of her doctoral study with a rural community in Chile. Therefore, her work builds on what Alsop and Heinsohn (2005) conceived.

It is important to distinguish between achievement of choice and the primary and secondary development outcomes before continuing because there exist commonalities but also important differences. As seen from the above examples, achievement of choice is when the use of choice results in a desired outcome. While there is overlap with development outcomes in that achievement of choice has a direct link to the primary development outcome of having choice (i.e. achieving choice means one has an effective choice she did not have before), there is not always a direct link between the achievement of choice and the valued doings and beings one desires (secondary development outcomes).

For example, while the woman who Alsop and Heinsohn (2005) imagined has an abusive husband may achieve choice by getting help from law enforcement and by extension also may have an effective choice as a primary development outcome, there is no guarantee that she will also have the valued secondary outcomes she desires, more autonomy, simply because she chose to get help from law enforcement. Indeed, there may be many more steps to take and other choices to be achieved, such as developing the confidence to leave the abusive husband (psychological resource), and then using her money (financial resources) and car (material resource) to escape him altogether. All of this might take time as a resource to see to fruition. The combination of her resources to navigate the structures she encounters may eventually lead the woman to having the valued being of more autonomy (secondary development outcome) as a part of her chosen valued life. However, getting help from law enforcement is just the starting point for this work, and actions over the long-term will give more insight into whether she can achieve her desired secondary development outcome. The primary development outcome of choice is either something one has or does not have, whereas valued doings and beings as secondary development outcomes are slightly more complex to assess and are likely to be a more subjective measurement. In line with this explanation, in this chapter I will explore the achievement of choice while Chapter 8 will contextualize the choices in the landscape of development outcomes.

To contextualize achievement of choice with the 22 girls I worked with in Nairobi, at the start of this education AR project, the exploratory study I implemented in July and August 2013 yielded data which suggested that part of what constituted a life the NDSS learners had reason to value was having choice to increase their access to educational content after school. This content could be in the form of educational information, but could also include formal learning books, as expressed by both NDSS learners and teachers. In her exploratory study interview from 2013, Principal Sumba also suggested that the exam-oriented focus in Kenya seems to limit the variety of books available to the girls and

she expressed a desire for this to change; further probing revealed she also wanted non-formal and informal learning materials to be accessible.

To measure achievement of choice in this context by applying the definitions elaborated by Alsop and Heinsohn (2005), Kleine (2007) and Kleine et al. (2012), I would need to assess whether the existence, sense, and use of choice to appropriate biNu and Worldreader to IATECAS resulted in a choice to increase one's access to educational content after school. To measure this, I will first examine the educational content the girls had access to during after-school hours *before* biNu and Worldreader were introduced. Then, I will use the app usage statistics to assess the educational content the girls had access to during after-school hours *after* biNu and Worldreader were introduced. Comparing this data should indicate whether the choice I introduced – and as seen in section 7.5 it was a choice that 16 of the girls used the entire study period – achieved the desired outcome of an increase in access to educational content after school.

The achievement of choice here will be distinct from use of choice in that the focus is not how much or how frequently the apps were accessed and used but *whether* educational content was actually accessed, *what* this content was<sup>27</sup>, and *how much more* access was gained when compared to the Pre-Intervention phase. The effectiveness of this choice will then be measured by analyzing qualitative data generated from an anonymous survey administered during the Evaluation phase and by the girls in letters to the creators of biNu and Worldreader which critiqued their apps. The analysis of these factors combined will indicate whether there was achievement of choice, and relatedly, if the primary development outcome of choice was attained.

### 7.6.1 Pre-Intervention Phase

In the Pre-Intervention phase, after-school observations were conducted with six girls: Linda, Leanta, Lupita, Wangari, Ada, and Gloria. Part of the data collection process was noting the material resources present in their homes that could, in theory, be used to access educational content. While planning for the AR process, Angela and I created a list of the possible material resources that might be found in the girls' homes: books (including novels, novellas, and children's storybooks), textbooks, past exam papers, encyclopedias, mobile phones, televisions, radios, newspapers, magazines, revision books, computers, and CDs. However, the observation chart (see **Appendix C** once more for reference) was open-ended and permitted the addition of material resources we had not thought to note.

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<sup>27</sup> This is because it was possible to use biNu solely for Facebook and YouTube without accessing any content that was overtly educational in nature.

Once observations with the six learners were completed, I took the data collected and noted which material resources were observed in which girls' homes. **Table 7-1** shows the results of this exercise.

**Table 7-1**

Research Participant	Book	Textbook	Past exam paper	Mobile phone	Television	Radio	Newspaper	Revision Book
Linda		X		X		X		
Leanta		X		X		X		
Lupita	X	X		X	X	X		
Wangari	X	X		X	X	X	X	X
Ada	X	X	X	X	X	X		X
Gloria		X		X	X	X	X	

*Material resources seen during after-school observations conducted February to April 2014 (Author)*

As seen from the chart above, encyclopedias, magazines, computers, and CDs were not observed in any of the research participants' homes, nor were any additional material resources seen which might be used to access educational content that had not already been noted in the list Angela and I created. Gloria's TV was battery-powered and handheld, so she could use it despite not having working electricity. During the observations, the girls were asked if there were any other things they might use for educational content after school that could not be seen. Only Ada shared that her father had his own television in his room that could not be seen in the living room where I was situated and where the family TV was located. I took the research participants at their word mostly because their homes were very sparsely decorated and were not filled with many items.

The least common material resources seen in the girls' homes were books, past exam papers, newspapers, and revision books. Past exam papers were usually borrowed from NDSS, along with revision books, since it was not affordable for most learners to buy a revision book for each subject every school year. Newspapers were not purchased every day, so it was possible that during the observations Linda, Leanta, Wangari, and Gloria's families had not purchased one. Each girl had a textbook present; however, only Ada and Wangari had every required textbook for school. The other girls had just one or two and sought shared access from classmates for all other textbooks needed.

There was high ownership of ICT devices, particularly mobile phones, which was expected since one of the selection criteria for the girls' research participation was mobile ownership. While at first it was surprising to note there were fewer paper-based material resources when compared to those that were digital, research has shown that televisions

and radios are likely shared among multiple household members, and for multiple years (Waema & Ndung'u, 2012). Additionally, these devices were all used each day of the observation by at least one person in the home.

Despite the relative ubiquity of televisions and radios among the research population, each girl stated that these devices were not used for accessing educational content because this type of content was scarcely offered through these media. They were, however, able to view and listen to informal learning and leisure content like soap operas, sports, and the news. Owing to Ada's greater financial resources given father's formal employment with the county, she was the only girl to have nearly all the material resources on the observation chart found in her home, and was only missing a newspaper (please revisit **Table 7-1** above). While these findings of course do not mean that use of the other available material resources in the six girls' homes to IATECAS did not occur, I can only state that it did not happen for the individual weeks that the six girls were observed between February and the first week of April 2014, and the girls themselves stated that they did not engage in such use either.

For the remaining 16 girls who were not observed after school, to discern the educational content they had access to at home, I drew from Pre-Intervention survey data. In addition to the material resources listed earlier in **Table 7-1**, the following items that had potential to be used in the girls' homes to IATECAS were mentioned in response to survey question 6 "*What things do you use after school to learn?*": exercise books, reference books, Bibles, and guide books. The six girls observed after school gave answers to this survey question which did not match the material resources available and use observed in their homes. Although the other 16 study participants provided answers to this survey question, I cannot be sure that these answers were accurate given the discrepancies that emerged when different research methods (triangulation) were applied with girls observed at home after school. Therefore, for these 16 girls I had to rely on the self-reported data the survey generated.

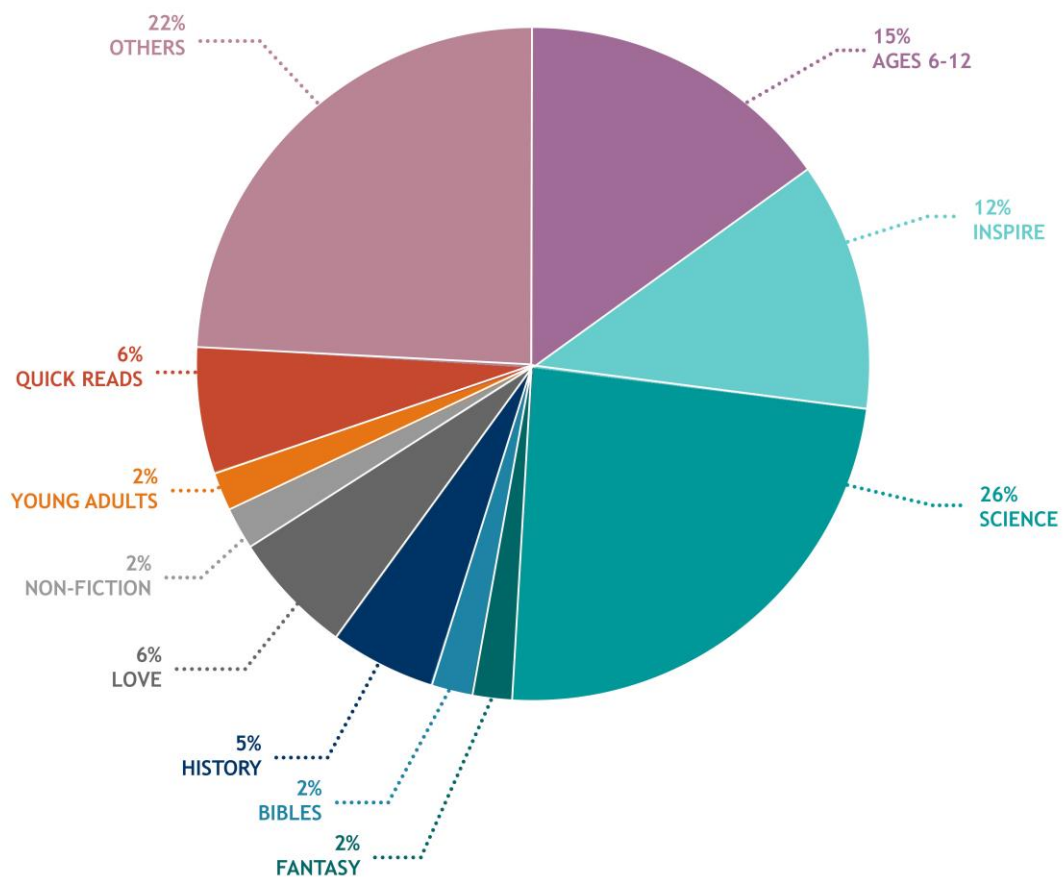
The overall analysis for the six girls observed after school illustrated that while there was some access to educational content possible, most girls did not usually exercise these choices. This was because, apart from for leisure, the digital material resources at home did not provide much content these secondary school girls wanted for learning. When the material resources did offer the content sought (e.g. some TV and radio programming connected to their schooling), the educational content was not offered frequently. In the case of mobile phones, the girls did not possess the knowhow to make use of the digital material resource in that manner, along with norms and discourses which limited this technology use. Where relevant content was provided through paper-based

material resources, the girls' agency was still constrained by norms which limited their time after school to make use of these resources.

### 7.6.2 Intervention Phase

The app usage statistics gathered during the Intervention phase provided a source to understand if achievement of choice was attained through use of biNu and Worldreader to realize an increase in access to educational content after school. Actual biNu and Worldreader usage was use of choice, but the ability to access relevant educational content was achievement of choice. Moreover, as explained earlier mentioned earlier, achievement of choice here is concerned with whether educational content was actually accessed through the apps, what this content was, and how much more access was realized when compared to the Pre-Intervention phase. To measure this, I first examined the books the girls read via the Worldreader app between April and June 2014. **Figure 7.8** illustrates the percentage of books read in the category types that Worldreader has its books placed in:

**Figure 7.8**



*Book categories read for five minutes or more between April to June 2014 (Author)*

I mostly used the same book categories that Worldreader had pre-categorized for ease of classification since some books had content that overlapped different categories. However, the "Others" category contains an amalgamation of books that the learners read from

categories accessed only once during the study. So as not to distort the data with single books in a category, I instead decided to combine them here. Some of the books grouped in “Others” related to human sexuality and entrepreneurship topics.

By far, science-related books were read most often, followed by books that contained content below the age range of the research participants (category Age 6-12). Speculative reasons for the popularity of science books, based on my knowledge of the context, could be that the sciences were often the most challenging classes in school. This was in part because NDSS lacked instruments for science instruction that might help build stronger understanding of abstract scientific concepts (see sub-section 4.3.2.). Furthermore, in visits I made to bookstores in Nairobi’s Central Business District, science books usually cost more than books for other subjects, further limiting the ability to purchase such content given the limited household means among the research population. I did not see any science textbooks during the six after-school participant observations either, apart from on the NDSS campus and in the library there.

Many of the books read in English were written for people below the research participants’ ages. Based on my reviews of the girls’ writing samples from homework and exams submitted to NDSS faculty, along with spoken English language heard during the semi-structured interviews and FGDs, it was clear that their English language communication skills were still in development. English was either the second or third language for most of the girls, and English was spoken at home only in the rare case that a household was comprised of more than one ethnic group – even then Swahili was used more often. Therefore, these books could have been read to enhance the research participants’ English competencies since, apart from their Swahili class, all classes were conducted in English. Other possibilities include that the girls accessed these books to read to younger siblings: In an FGD conducted in June 2014, Nancy remarked that she read stories from Worldreader to her little sister to help her fall asleep. This was something that she stated she did not do prior to the Intervention because the appropriate reading materials were not available to her.

In the “Others” book category, we also saw book titles that guided readers on how to cook chapatti, a non-formal learning book that at least three learners accessed and read in full; it was about three pages long. Leanta remarked in passing that she used the recipe to practice making chapatti for her own family, likely also a nod to her mother’s business. Perhaps the most surprising book in the “Others” category read by every research participant in full within the first month of the Intervention phase was one on male condom instruction which told how men needed to put on and remove condoms. In a June 2014 FGD, when I reviewed the first tranche of app usage statistics and saw that every girl

read this book, I decided to ask which books they had read. When no one mentioned *Male Condom Instruction*, I raised the topic myself. All the girls laughed nervously and many put their hands over their faces or looked away. It was obvious that it was an embarrassing admission to them so that is why they did not mention it. When I asked, in a non-confrontational manner, why they had read the book, I still received no response. I then simply told them that it was good that they had read the book and that I hoped that they had learned something practical.

Research from two schools, one in South Africa and one in Kenya, on gender, education, and poverty reduction in schools has found that the assignment of traditional gender roles to boys and girls happens at an early age (Unterhalter et al., 2009). Once the transition into adolescence commences, harmful stereotypes, particularly those related to sexuality, are perpetuated by adults, including teachers and school community members. These discourses place both the responsibility and blame for immoral youth behavior in Kenya and South Africa on girls, and sometimes even their mothers because of the perception that they have not raised their daughters well.

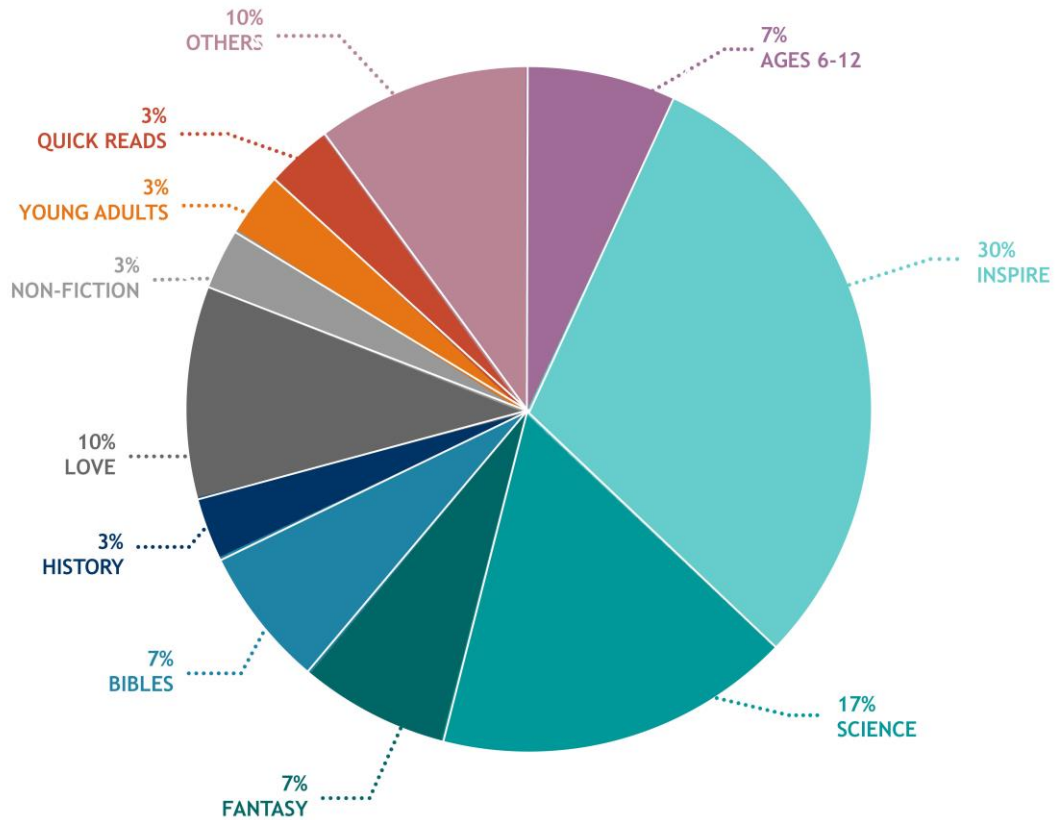
Unterhalter et al. (2009) also found that while classroom conversations about sexuality and adolescence occurred in the South African school she studied, this was not the case in the Kenyan school. This dovetailed with my two years of experience at NDSS, as conversations on this subject mostly occurred informally with students or through infrequent, whole-school non-formal learning activities arranged by Principal Sumba. A comprehensive literature review on the availability of sex education for young girls in Kenya also found that the availability of such instruction is scarce in the country (Agbemenu & Schlenk, 2011). When understood from the perspective of the Unterhalter et al. (2009) study, the girls' reaction to my questions, even though they were posed during after-school hours, was unsurprising because we were in a classroom where such talk rarely happens. Furthermore, a lack of sources to obtain this valued content on male condom instruction likely made the relative ease of accessing this type of information discreetly on Worldreader appealing. Nonetheless, it also adds evidence which suggests that girls in Kenya are brought up to believe that they must assume the responsibility of pregnancy prevention, and this may have been a proactive measure on the girls' part to seek this information for themselves.

From July to December 2014, there was a significant shift in the book types accessed by the 16 research participants whose app usage statistics remained traceable during this period: Most books read for more than five minutes during these six months were for topics that could broadly be categorized as oriented towards informal or non-academic learning unrelated to their studies at NDSS (see **Figure 7.9**). This contrasts with



the earlier period from April to July 2014, when books more oriented to formal learning were the majority of all books read.

**Figure 7.9**



*Book categories read for five minutes or more between July to December 2014 (Author)*

While I was unable to pinpoint with certainty why there was a drop in the number of formal learning books read in the second period when compared to the first two months of the intervention (although Science and History books held relatively steady), one possible explanation relates to this period coinciding with when I departed Nairobi to continue data collection remotely.

When I departed Nairobi, even though I still interacted with the girls via biNu messenger, and they were aware and gave permission for me to continue monitoring their app usage remotely, it is possible they may have not felt any real or perceived pressure to use the apps as often as they did for formal learning compared to when I was physically present. It is also possible that over time, the girls discovered more intrinsic joys of using the apps and developed an understanding that it does not always have to be used for (formal) learning. If so, this user-led change would be an explicit display of empowerment to challenge the status quo of an intervention that was somewhat serious and formalized in nature, in order to seek enjoyment of a more playful variety.

This supposition is strengthened by research which found that when people in developing country contexts appropriate mobile phones as participants in ICT4D interventions, more leisure-orientated (e.g. stories of inspiration and love) and social uses of the device can arise which still contribute to people's personal development, albeit in a different manner (Sey & Ortoleva, 2014). When viewed from this standpoint, the shift from formal learning to informal learning content accessed and read could also be viewed as evidence that ultimately intrinsic motivation was the most sustainable input for this AR process since this motivation is more likely to point to the lives research participants had a reason to value.

Reflecting further on the possible reasons behind the change in book types read, when the AR process was initially conceived, I knew there would be a need to calm concerns and queries from the NDSS school community about why the girls were using their mobile phones more frequently after school and why they sometimes brought the devices to school. This is because, as discussed in Chapters 4 and 6, there was a ban on mobile phones being carried to school by students in Kenya, and as noted in this chapter, parents and guardians, as well as teachers, have previously expressed negative views on youth mobile use (UNICEF/InterMedia, 2013). With this mobile ban enforced and these agency-constraining discourses rife in the context, I decided to emphasize the formal learning content the two apps made accessible to minimize the (potentially negative) influence of these powerful structural elements. In my interactions with the research participants, I tried to balance my awareness-raising of the potential to use their mobile phones to IATECAS between formal and informal learning opportunities. Nonetheless, because our primary research setting was the school grounds during after-school hours, discussions on app appropriation focused on its use to enhance formal learning.

Another source to triangulate and discern achievement of choice was an anonymous survey conducted in the Evaluation phase. I asked the research participants to name their favorite apps to use in biNu since the app usage statistics only indicated for how much time an individual user spent using biNu and not the apps on the platform that she used. The responses highlighted that the books accessed on Worldreader via biNu were but one source the appropriated through biNu to IATECAS:

*YouTube because it helps me in gratifying my curiosity.* Anonymous Respondent 12

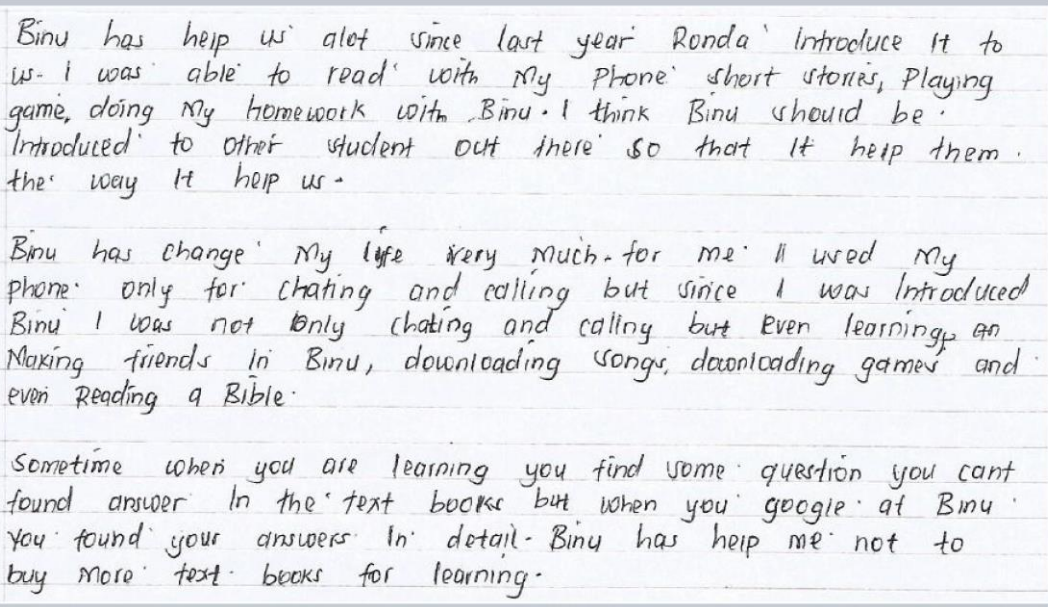
*beSmart because there I can find the science zone that helps me in revising or reading.* Anonymous Respondent 20

*English Dictionary because it helps me to know new words that I get along with.* Anonymous Respondent 8

*[The] religion [app] because I learn more about how to live in peace with others and to live in a Christian way. Anonymous Respondent 5*

The final data source I will draw on is letters I asked the girls to write to the creators of biNu and Worldreader as part of the participatory learning workshop organized during the Evaluation phase. After I obtained permission to use the content contained in their letters, I made scans of these letters on a return visit to Kenya in 2015 before returning them to the learners. Here, I highlight statements written by Elaine, Faith, Mercy, and Susan, in which they examined their own ability to IATECAS. Transcriptions of the texts in **Plates 7.5 to 7.8** can be found in **Appendix R**.

#### **Plate 7.5**



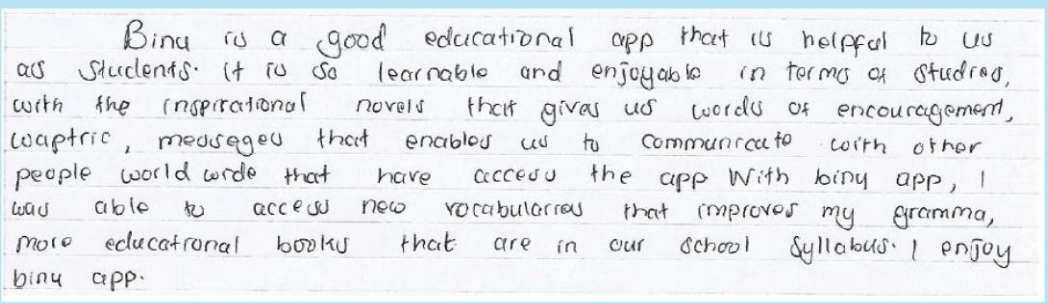
Binu has help us alot since last year Ronda introduce it to us. I was able to read with my phone short stories, playing game, doing my homework with Binu. I think Binu should be introduced to other student out there so that it help them the way it help us.

Binu has change my life very much. for me I used my phone only for chatting and calling but since I was introduced Binu I was not only chatting and calling but even learning, making friends in Binu, downloading songs, downloading games and even reading a Bible.

Sometime when you are learning you find some question you cant found answer in the text books but when you google at Binu you found your answers in detail. Binu has help me not to buy more text books for learning.

*Excerpt from Elaine's letter to biNu and Worldreader creators (Author)*

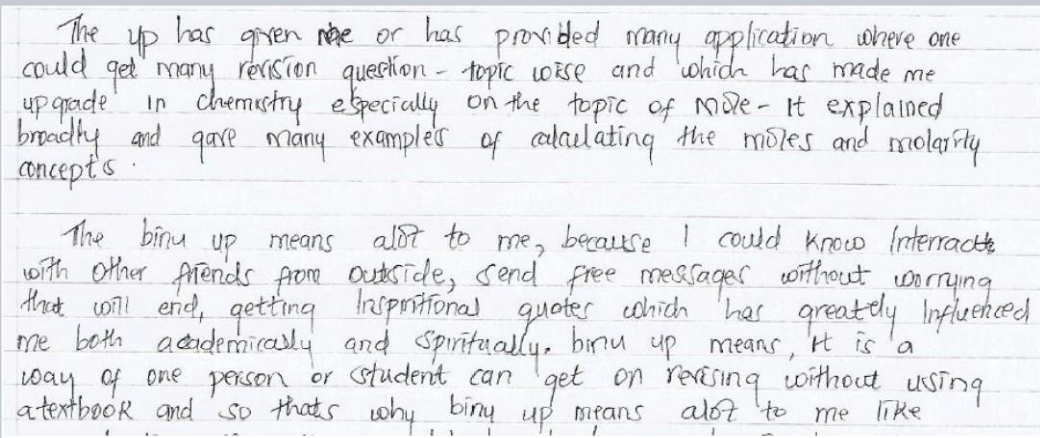
#### **Plate 7.6**



Binu is a good educational app that is helpful to us as students. It is so learnable and enjoyable in terms of studies, with the inspirational novels that gives us words of encouragement, waaptic, messages that enables us to communicate with other people world wide that have access the app. With binu app, I was able to access new vocabularies that improves my grammar, more educational books that are in our school syllabus. I enjoy binu app.

*Excerpt from Faith's letter to biNu and Worldreader creators (Author)*

### Plate 7.7

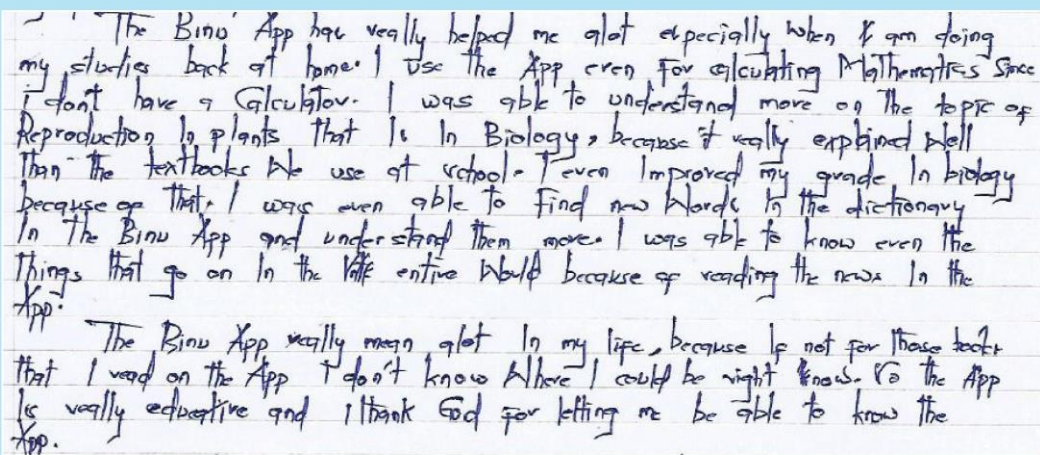


The up has given me or has provided many application where one could get many revision question - topic wise and which has made me upgrade in chemistry especially on the topic of molar - It explained broadly and gave many examples of calculating the molar and molarity concepts.

The binu up means alot to me, because I could know interact with other friends from outside, send free messages without worrying that will end, getting inspirational quotes which has greatly influenced me both academically and spiritually. binu up means, it is a way of one person or student can get on revising without using a textbook and so that's why binu up means alot to me like

*Excerpt from Mercy's letter to biNu and Worldreader creators (Author)*

### Plate 7.8



The Binu App has really helped me alot especially when I am doing my studies back at home. I use the App even for calculating Mathematics since I don't have a Calculator. I was able to understand more on the topic of Reproduction in plants that is in Biology, because it really explained better than the textbooks we use at school. I even improved my grade in biology because of that. I was even able to find new words in the dictionary in the Binu App and understand them more. I was able to know even the things that go on in the life entire world because of reading the news in the App.

The Binu App really mean alot in my life, because if not for those books that I read on the App I don't know where I could be right know. So the App is really educative and I thank God for letting me be able to know the App.

*Excerpt from Susan's letter to biNu and Worldreader creators (Author)*

Earlier, we saw evidence that because all 22 research participants read the book on male condom instruction, this indicated that they likely valued what Nussbaum (2003a) calls maintaining their bodily health. Their comments in the letter excerpts above also integrate other expressions of the lives they have a reason to value beyond improved grades and academic success, including the desire to be able to affiliate with others, to play, and to use their imaginations (M. C. Nussbaum, 2000). This data once more contradicts the predominant stereotypical and hegemonic framing of girlhood in the Global South by illustrating that girls' desired development outcomes and the lives they value leading are multi-faceted and not as narrowly or singularly focused on formal education and literacy (M. C. Nussbaum, 2003).

Elaine's letter highlights that biNu helped her access short stories, games, songs and the Bible. She also underscores that although the textbooks she had available to her before the intervention were used for learning, she was not always able to find answers to questions she had. Now, she uses biNu to increase her access to further content that might

enhance what is found in her textbooks. Finally, her statement that: *“biNu has [helped] me not to buy more textbooks for learning,”* implies that she previously had a desire to increase her access to educational content after school that likely went unfulfilled due to limited financial resources. However, now she had achieved choice since use of biNu enabled her to increase her access to more educational content, and probably more affordably than through the purchase of paper-based content.

In her letter, Faith comments that, given more choice, the girls would probably also enjoy content beyond what was related to formal learning, such as *“...inspirational novels that gives us words of encouragement.”* Again, we see here that what constitutes the life an NDSS learner has reason to value is both more complex and multi-dimensional than outcomes narrowly focused on formal learning. It also points to the need to design human development interventions in a manner that can meet multiple desires, including those people may not have initially expressed directly, possibly because they did not know they had the desire until they were given a choice.

This echoes findings from an evaluation of a teacher training program in Bangladesh which was designed to increase the number of female teachers in rural areas as a mechanism to grow the number of girls who enrolled in secondary school (Raynor & Unterhalter, 2008). While the initial focus of the program was to increase the number of female teachers and secondary school girls, as time passed, opportunities to engage in gender and advocacy work emerged. Furthermore, female teachers expressed that they not only valued the training but also the increased status they gained in their communities because of their training participation (cultural resource), as well as confidence (psychological resource) and educational qualifications (educational resource) by being a part of the program. Likewise, in my study in Nairobi, the girls experienced unanticipated resource portfolio enhancement that came to form part of a life they valued. However, prior to participating in the study they did not realize they valued these resources since the choice was not one they knew existed.

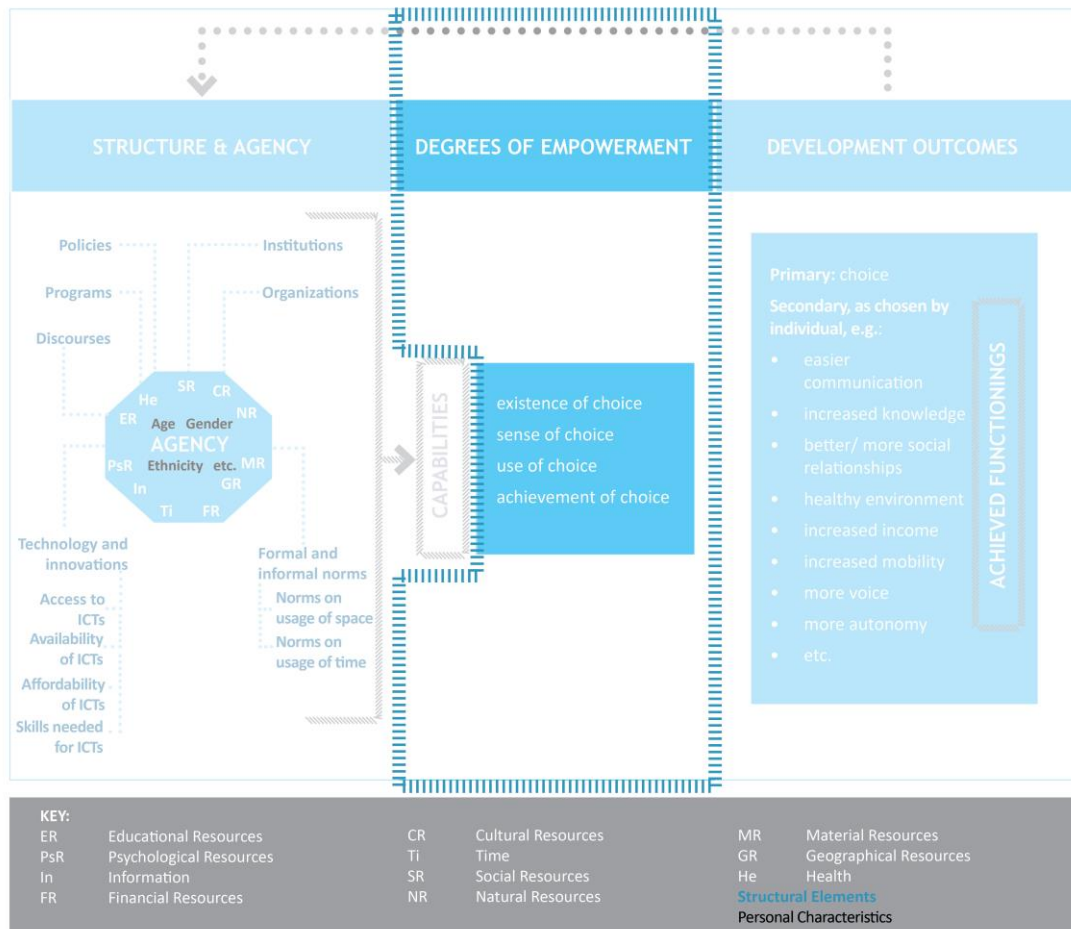
Like Elaine, Mercy remarks that she enjoyed the two apps since they could be used instead of textbooks to gain access to more educational content after school. She also suggests that this achievement of choice was not solely about academic success but that the different content types were valuable to her as she explored and developed her spirituality (psychological resource). While Elaine and Mercy focused on the apps as conduits for content they could not get in their textbooks, Susan used one of her apps to perform calculations to practice mathematics since she apparently had no other mechanism for doing so pre-intervention. She also increased her access to educational content from current events, stating: *“I was able to know even the things that go on in the*

*entire world because of reading the news in the app.”* Susan’s statement about the news was surprising since she had both a TV and radio in her home. Yet, because the news apps within biNu provide information primarily from countries outside of Kenya, something that was not often done in media in the country or for an extended part of news programs (Ogola, 2011), she expanded the type of news content she had a choice to view.

Considering the book types the girls read, the results of the anonymous survey shared earlier in this sub-section, and the letters written to the creators of biNu and Worldreader, when compared to the educational content the girls had access to during the Pre-Intervention phase, there was a substantial increase in the type and variety of educational content the girls could access after school once the biNu and Worldreader apps were introduced. Not only did they use the choice they were presented with but they also achieved choice in accessing a variety of the educational content after school, including at least 11 different categories of books on Worldreader. This content was educational in nature but not just for formal learning – as we saw in the shift of book types accessed during the study period, there was a great deal of content contained across Worldreader and multiple standalone apps available on the biNu platform that would be classified as non-formal and informal in nature. This content was valued for many reasons, as seen in the above letters, but most importantly because the girls previously had little to no choice in the type of content available to them after school prior to the intervention.

## 7.7. Conclusion

Figure 7.10



*Reimagined Choice Framework, degrees of empowerment highlighted. Developed by the Author based on Kleine (2013)*

In this chapter, the Choice Framework was used to evaluate whether and to what degree 22 secondary school girls in Nairobi could make a choice that would help them increase their access to educational content after school. This analytical tool helped deconstruct the dimensions of empowerment, also expressed as the degrees of choice, and demonstrated that the pathway to achievement was full of challenges and unexpected occurrences.

First, I looked at the *existence of choice* from the perspective of whether the girls knew that biNu and Worldreader existed. I also explored existence of choice from the viewpoint of the different barriers that contributed to a lack of existence of choice after school to use mobile media to increase access to educational content among the research participants. I found that the lack of existence of choice of IATECAS at NDSS was not limited to the two mobile applications I proposed to help the girls realize their desired primary development outcome: There was also a considerable dearth of media, digital or otherwise, in their homes that might have otherwise been used individually for learning. These circumstances curtailed what the girls thought may be possible in terms of their ability to IATECAS before biNu and Worldreader were introduced.

To ascertain the status of the girls' *sense of choice* for the proposed solution, I had to use their perceptions of mobile as a learning tool and their mobile digital literacy levels to triangulate whether they believed the apps were solutions they could choose to make use of to IATECAS given their attitudes and skills. Through this analysis, we saw that the sense of choice was confronted with negative discourses in the context on youth mobile use transmitted from adult stakeholders to the learners. This meant that the initial sense of choice was quite limited among the research participants. Over time, the sense of choice was positively broadened as the girls observed for themselves how their mobile appropriation could be beneficial in ways that neither they nor their teachers, parents, or guardians might have previously understood was possible. This shifted the perceived utility of mobiles among the participants, paving the way for the *use of choice* to be pursued.

As the academic year progressed, the girls faced many structural obstacles as they sought to use the choice I introduced. Their home environments were imbued with many restrictive discourses and norms which contributed to varying levels of access throughout the study. Repeatedly, norms related to the use time and space emerged as powerful barriers to the girls' ability to use their mobile phones for any reason. There were six girls who faced structural obstacles too difficult for them to overcome, effectively blocking them from an opportunity to increase their access to educational content after school. Nevertheless, 16 of the 22 research participants maintained the use of choice for the study duration, albeit with decreased frequency when compared to the first month in which they had access to the apps. This continued use over time created space for the *achievement of choice* to emerge.

Given the development outcome the girls expressed at the start of this study, experiencing an achievement of choice would require that by using biNu and Worldreader, they gained access to more educational content after school than they had prior to the intervention. The media, amount, and type of content to choose from in this area was limited prior to the study, but mobile data drawn from app usage statistics illustrated that not only did the girls' access in content grow but also their own ambitions for having diverse content to peruse similarly expanded. With biNu and Worldreader, the girls could choose to read books that might support their formal learning and also other areas of their lives they appeared to find just as important such as building their: confidence through inspirational stories, spirituality with religious texts, skills via instructional books, and knowledge related to their sexual and reproductive health and rights by reading how males are supposed to put on condoms.

The *existence, sense, use, and achievement of choice* in this study was linked directly to the primary development outcome of having choice to increase the girls' access



to educational content after school. Yet, as we will see in Chapter 8, the primary development outcome of having choice to IATECAS was viewed as a pathway to realize two secondary development outcomes: attaining academic success and improving school grades as valued doings. Accordingly, through use of the Choice Framework to reflect on the secondary development outcomes of this study, in the next chapter I will show that expanding people's freedom in a way that they have more choice in one area of their lives, namely their resource portfolio, is insufficient when attempting to help them realize goals which might require multiple resources and more favorable structural elements to be expanded in parallel. This suggests that actions taken for change need to be brought about in a holistic manner.

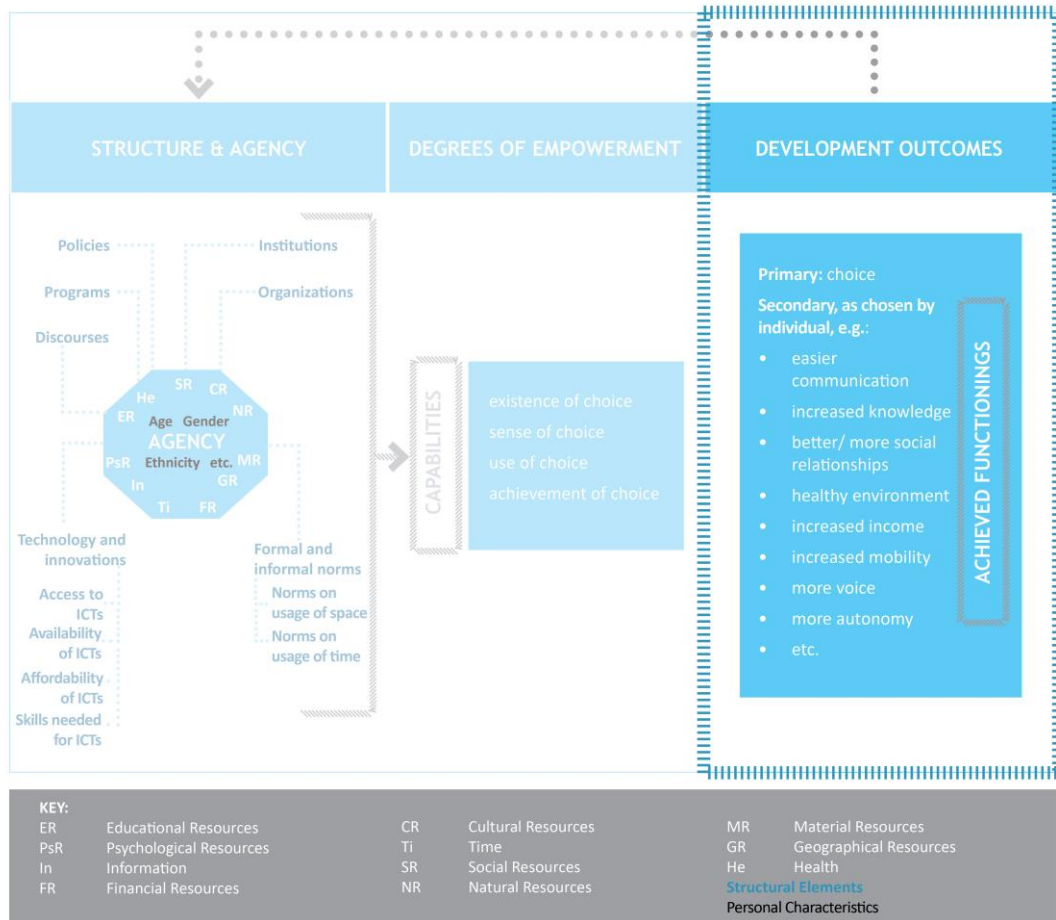
## Chapter 8: After-School Development Outcomes

### 8.1. Introduction

In Chapter 6, I deconstructed the structural elements and resource-based agency components observed in the after-school hours with a group of 22 girls from New Day Secondary School. Following this, in Chapter 7 I assessed the existence, sense, use, and achievement of choice to understand the degrees of empowerment the research participants experienced as they attempted to realize choice in increased access to educational content after school. Both discussions illustrated that a holistic analytical approach is required when evaluating the impact of an intervention designed to bring about change the research participants value. This is because a confluence of factors can affect the intervention – some unexpected and often multi-faceted – and these effects can manifest in different ways for different people.

Therefore, to understand more fully the intervention impact first introduced in Chapter 1 and probed in subsequent chapters, there is a need to remove one additional layer of the CF to delve into the development outcomes (see **Figure 8.1**) which the girls expressed a desire to realize.

**Figure 8.1**



*Reimagined Choice Framework, development outcomes highlighted. Developed by the Author based on Kleine (2013)*

In the CA, choice is the primary development outcome and the valued doings and beings a person hopes to achieve represent the secondary development outcomes. As we saw in the preceding chapter, all the research participants experienced the achievement of choice to increase their access to educational content after school, meaning that post-intervention the 22 girls realized a choice they valued. However, only 16 girls continued to use the apps at the end of the fieldwork period, and thus only 16 sustained this achievement of choice. Six girls were unable to continue pursuing their secondary development outcomes for this study even after they had attained choice, including achievement of choice. At the start of the intervention the participants articulated two additional secondary development outcomes: 1) to improve their grades and 2) to have academic success. The intention then in this chapter will be to establish, insofar as the evidence makes possible, whether these 16 research participants realized these other two secondary development outcomes they had reason to value.

In the following sections, I will briefly lay out how I worked with learners at NDSS to help them work towards achieving the secondary development outcomes they desired for the 2014 academic year. Next, I will develop case studies which will unpack how physical

and virtual mobility came to bear on the girls' attempts to realize their secondary development outcomes. This will be done to illustrate how mobility (constituted of time, health, and geographical resource at a minimum) and the link to the development outcomes in this study was shaped. Finally, I will apply the CF to consider how, if at all, the mobile intervention was instrumental in assisting a group of secondary school girls as they worked to achieve their after-school development outcomes.

## 8.2. Gathering the Girls' Development Outcomes

The exploratory study conducted in July and August 2013 (see **Chapter 1**) revealed at least one consistent primary development outcome among the research population: having choice to increase access to educational content after school. Near the beginning of the 13-month action research process, in January and February 2014, the 22 research participants were asked to provide further insight into why having choice to IATECAS was desired to arrive at the valued doings and beings they envisioned attaining. Then, throughout the AR process I worked with the girls to assess if their desired secondary outcomes remained the same and if they thought they were attaining them.

**Table 8-1** presents an overview of the AR process first shown in Chapter 5; the methods highlighted in blue lettering indicate points where the learners and I engaged in work related to identifying their development outcomes.

**Table 8-1**

Action Research Phase	Duration	Methods
Phase 1 Pre-Intervention	December 2013 to the final week of March 2014 (four months)	<ul style="list-style-type: none"> <li>Participant observation</li> <li>Surveys</li> <li>Semi-structured interviews</li> <li>Focus group discussions</li> </ul>
Phase 2 Intervention	April 2014 to first week of December 2014 (eight months)	<ul style="list-style-type: none"> <li>Participant observation</li> <li>Remote participant observation</li> <li>Research diary</li> <li>Ranking and association game</li> <li>Focus group discussions</li> <li>Semi-structured interviews</li> <li>Card game</li> <li>App usage statistics</li> <li>Survey</li> </ul>
Phase 3 Evaluation	December 2014 to January 2015 (one month)	<ul style="list-style-type: none"> <li>Survey</li> <li>Ranking and association game</li> <li>Research diary</li> <li>App usage statistics</li> <li>Participatory learning workshops</li> </ul>

*Research methods used (blue lettering) to identify development outcomes (Author)*

The surveys and FGDs in the Pre-Intervention phase and the semi-structured interviews in the Intervention phase were utilized to help the girls voice their secondary development outcomes. In the PLA workshop, I asked the participants to ponder if the development outcomes they sought to achieve had been realized by the time the intervention concluded.

### 8.2.1 Pre-Intervention: Surveys and Focus Group Discussions

Survey question 9 in the Pre-Intervention phase (see **Appendix H**) asked the girls: “What are your objectives for your education, if any, **during the next six months**, until July 2014?”

Their responses, varied but many mentioned that they wished to earn higher grades:

*I want to upgrade from my last mean. Halima*

*To get higher grades as I proceed to another term. Beryl*

*Get a C+ and above, to keep on driving, achieve my interest in education. Faith*

*Work hard, to be self-driven, disciplined, keen in my timetable. Nancy*

*I want to improve my grades, go to the cyber to get information of how to study, change my attitude towards my studies. Leanta*

*To work hard in school not just because of my parents and teachers but also to my benefit to pursue the different goals I share. Ann*

*To find research of the things I do not understand. Wangari*

In the near term, the girls appeared to value good grades because they relied on them to help justify the investment of time and resources into their education by school faculty and staff, parents and guardians, and/or other potential sponsors. This was crucial because, as I found previously, a lack of financial resources was the strongest barrier to consistent school attendance among the NDSS student population (Zelezny-Green, 2014). A girl pupil who was not successful academically (as evidenced by her grades) would be much less likely to garner funding assistance, especially since prevailing attitudes in Kenya already place less importance on ensuring that girls complete their secondary education (Warrington & Kiragu, 2012). In the long term, the girls' educational objectives likely illustrated their awareness that if they earned good grades, they could realize academic success, and maybe even be awarded a government-sponsored scholarship to attend university.

These situations suggest that the learners are influenced by their unavoidable dependence on people who are older than them (because of their age, the girls generally have few possibilities to generate an income for themselves,) and a government initiative which could make financial contributions that would temporally extend the girls' formal education participation. The circumstances also reflect what has been found elsewhere in girls' education in terms of the factors which help keep girls in school (Unterhalter et al., 2014). This makes it difficult to discern if the girls were expressing their own educational ambitions or if their statements were, shaped by stakeholders and bound by structural inequalities, mostly the outcomes that are applauded within their society. The data here points to a likely example of adaptive preferences whereby the girls have self-censored themselves to focus on the development outcomes they believe they have a reasonable chance to attain (Kabeer, 1999). However, even if the girls were influenced in this manner, their desire to lead a life they have a reason to value by improving their grades and having academic success could still spur freedom expansion in other areas of their life.

### 8.2.2 Intervention: Semi-Structured Interviews

The questions posed during the semi-structured interviews conducted in the Intervention phase in June 2014 can be found in **Appendix E**. Through this research method, I sought to

pinpoint the girls' educational objectives for the 2014 academic year after biNu and Worldreader were introduced:

*To attain the goals I've set. To improve my grades, and to learn more about biNu and teach other people.* Everlyne

*To better my grades and to better my English, and to be able to learn new things.* Damaris

*To study harder.* Ada

*For my education, I want to learn more about sciences, and to get more information.* Halima

*I want to achieve a good grade that will take me to a good university. I need a B.* Marie

*I want to achieve a grade that will enable me to go to university. Esther*  
*First, I want to change my grades from C- to B+.* Leanta

By the time of these semi-structured interviews, five months had passed since the girls were asked about their secondary development outcomes. Yet, apart from Ada and Halima, every girl I individually interviewed still wished to improve their grades. Part of the reason for this could be that at the time the semi-structured interviews were conducted (June 2014), the learners had completed their Term 1 exams a few weeks prior. Their exam performance would help determine the final grade they earned in a subject, and eventually linked to their future university enrollment prospects. As mentioned earlier, earning a high grade (at least a B+ average) meant the girls would automatically gain a government-sponsored scholarship to university, and increased their chances of attending a top-ranked tertiary institution in Kenya. The emphasis I placed on inquiring about the learners' educational objectives also undoubtedly contributed to the responses elicited. Nevertheless, I never limited the girls to share education goals solely related to their formal schooling.

### 8.2.3 Participatory Learning Workshop Evaluation

The final direct engagement with the research participants' secondary development outcomes came in the Evaluation phase during the PLA workshop in January 2015. The workshop took place a year after the AR process commenced with research activities in which the girls were participants. At this point, the learners had received results from their 2014 academic year final exams, and had established awareness of biNu and Worldreader apps for nearly ten months (although mobile data collection was suspended in December 2014). The goals shared during the workshop spoke to the persistent importance of formal education in their lives:

*To achieve a B- because the last term I had a C+. Mercy*

*Now that I have a C, I need to attain C+ and above. Lupita*

*To attain a mark to take me to college or a university. Marie*

*To improve on my grades and to work smart is my goal. Faith*

*To work hard and improve in all the subjects. Beryl*

When compared to the semi-structured interviews during the Intervention phase, the data shows all 22 research participants maintained a desire to improve their grades and/or overall academic performance. Notably, both Ada and Halima changed their goals cited in the Intervention phase from “*studying harder*” and “*I want to learn more about sciences, and to get more information,*” respectively, to be more precise in the Evaluation phase stating, like the other research participants, that improving their grades was their main goal. The passage of time during the AR process yielded little variation in terms of the secondary development outcomes the girls wanted to work towards.

The data collected during all three stages of the AR process was intended to serve as a mechanism for understanding the girls’ rationale behind the selection of certain development outcomes. By doing so, insight was developed into the kind of lives the girls had reasons to value. Yet, even with these secondary development outcomes understood, the ability to work towards realizing them was fraught with barriers arising from the structural elements and resource-based agency components, or lack thereof, that have been discussed in Chapters 6 and 7. While identifying these barriers was a relatively straightforward endeavor, developing action strategies that might mitigate the impact of these barriers on the research participants was a considerable challenge. The realization of choice to IATECAS as a primary development outcome, while helpful for engaging in further work to improve the girls’ grades and academic success as secondary outcomes, still did not guarantee these outcomes could be attained by all research participants. As will be seen in the analysis which unfolds in the sections to follow, choice gained through narrowly focused enhancement of the girls’ resource portfolios (in this study, mostly by providing the girls with two new material resources: biNu and Worldreader) is insufficient to realize longer-term secondary development outcomes if hostile structures within which the girls use these resources remain unaltered.

Application of the CF as an evaluative tool in this study revealed that mobility, and time as a resource wrapped in mobility, were significant factors which affected the girls’ ability to work towards achieving their expressed development outcomes. As the learners’ physical and virtual mobilities become the focal points of analysis in the next two sections, we will observe that there were subtle nuances in the girls’ experiences during the AR process which contributed to disparate secondary development outcome achievements.



### 8.3. Physical Mobility Experiences

Physical mobility is the first type of movement that will be examined to understand the roles played by mobility and time regarding intervention impact. Particularly, I will discuss the quotidian journeys between home and school that New Day Secondary School girls undertook.

#### 8.3.1 The Journey Home from School

The extended school day at NDSS (see **sub-section 4.3.5**) concluded at approximately 6:00pm. Owing to Nairobi's proximity to the equator, the sun sets between 6:50pm (in January) and 6:21pm (in November) during the academic year, (timeanddate.com, 2014a, 2014b). This means that, depending on the journey length, once the girls departed NDSS it may be completely dark by the time they reached home. If a journey home was made by public transportation, leaving school at 6:00pm invariably meant traffic jams along the two main roads near NDSS (McGregor & Malingha Doya, 2014). Traffic jams often doubled research participants' commuting times, especially on Fridays and the first day of the month (pay day). Girls could also encounter traffic congestion when traveling by foot because hundreds of people made their way home from markets, schools, and work at roughly the same time that the extended school day ended. Adding to the journey times by foot or motorized vehicle were the roadway and pedestrian path hazards such as potholes, uncovered manholes, and uneven surfaces which were not easily spotted. The difficulty in navigating these hazards was of course intensified once darkness fell. For most NDSS learners, this meant that leaving school on time was a priority.

As mentioned in sub-section 5.6.2.1., data about the girls' after-school lives was gathered in part via direct observation of six girls, representing just over a quarter of all research participants. Only six were observed after school because, besides time constraints, the participants had to meet certain eligibility criteria to participate in this research method. What follows is analysis of the direct observations of two research participants' journeys home from school, Leanta and Gloria<sup>28</sup>. Additionally, I will consider Zeituni's journey home based on her own retelling of her commute on two separate occasions. These three girls all sustained their primary development outcome of the choice to IATECAS throughout the study. They were selected as case studies because they represented typical, unique, and revelatory unique cases (Yin, 2012), respectively, of NDSS research participants' physical mobility experiences after school. The girls' case study types will be explained once each learner's experience is introduced. Time allocation during their

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<sup>28</sup> The space constraints of this thesis did not permit in-depth discussion of the circumstances of the after-school commutes of the other four girls directly observed, Ada, Linda, Lupita, and Wangari.

journeys home from school varied markedly. We will see that the differences in physical mobility experienced during these commutes influenced the secondary development outcomes the girls could achieve.

### 8.3.2 Leanta's Journey Home from School

Of all the girls observed after school, Leanta lived second nearest to NDSS, about 35 minutes by foot if one traveled there directly without stops. Her commute from school was a typical case characterized by the performance of unpaid domestic work:

**Researcher's diary entry March 10, 2014:** *On the route home with Leanta, we greeted her aunts and cousins [...]. Leanta stopped to pay for a bag of unknown contents from the butcher. We then went to her mother's shop to help her close up, before we reached her home at 6:50pm...*

I later learned that the bag contained beef. The purchase took approximately five minutes to transact due to the number of customers and the need to perform greetings since I was somebody new accompanying Leanta who needed to be introduced, as was customary. We then walked ten minutes further (after walking 25 minutes from NDSS to the butcher shop) to Leanta's mother's *chapatti* stall. While Leanta was not paid as an employee for the support rendered, the money generated from her mother's shop helped pay school fees and provided her with a small weekly allowance. We remained at the shop for about 20 minutes.

Nonetheless, because Leanta's walk home took a minimum of 35 minutes (without interruptions), when the sun set between 6:20 and 6:40pm it was guaranteed that part of her journey would be made at dusk with decreased visibility. This was problematic because pedestrian paths were not always level, and often had gaps in the pavement. Purchasing food for the evening meal and helping her mother close her shop before we reached home prolonged the time (to an hour total instead of 35 minutes) that Leanta had to spend walking outside in an area that was regularly punctuated by robberies and other petty crimes. Activities Leanta carried out during this journey remained relatively unchanged during the three weeks Leanta was observed after school during Terms 1, 2, and 3; only on two occasions of the 15 days observed was she not required to purchase food for the evening meal.

From the above, we see that being tasked with errands related to the upkeep of her home served as a disruption which typified Leanta's "mobile time and space" (Cresswell & Merriman, 2011, p. 4), or time she spent moving through different spaces on the journey home from school. These errands added at least 25 minutes to her commute home. Her domestic responsibilities (please review **sub-section 7.5.2.**) ultimately diminished both her time and energy, which she might have used to engage in after-school

activities of her choosing, when and if the opportunity became available. Furthermore, the nature and timing of Leanta's journey was unsafe, from a gender standpoint: Leanta was rarely accompanied when she walked home from school. Walking alone in the evenings in Nairobi – and sometimes even during the day – can be dangerous because of people who might attempt to rob or otherwise harass unaccompanied pedestrians, particularly women and girls (Anderson, 2002). An additional consideration is that Leanta's older brother Dante who recently graduated secondary school was not responsible for completing any tasks during his commute home (for more on Leanta's brother, please revisit **sub-section 7.5.2.**). Thus, the gendered division of labor after school among occupants of Leanta's household contributed to variations in her daily mobility pattern that made her journey home from school longer and more unsafe since it occurred partially in darkness. These circumstances rendered her physical mobility a barrier that could negatively affect her ability to work towards her secondary development outcomes once she arrived home because of the time these after-school responsibilities depleted.

It is also worth noting that there were at least two *matatu* routes from NDSS to Leanta's home that could have shortened her after-school journey to ten minutes. Like in many other urban centers in developing countries, transport affordability is a major and recurrent challenge for people in Nairobi (Salon & Gulyani, 2010). As I learned while conducting an informal mobile interview (Porter, Hampshire, Munthali, et al., 2011) while walking with Leanta, she was unable to afford the available commercial transport home. She also needed to travel by foot to complete the errands expected of her along the way. Viewing Leanta's situation with the CF lens, her time spent traveling home from school was increased for multiple reasons:

1. Her home was not located near the school (geographical resources).
2. She lacked the money (financial resources) to take a speedier form of transport home from school.
3. She was expected to engage in activities to support the ongoing operation of the household (informal norms on usage of space and time).

Leanta's journey home from school contributed further evidence of the strong links between girls' education, constrained physical mobility, gendered household labor demands, and the ability to work towards desired outcomes during after-school hours (Porter, Hampshire, Abane, et al., 2011). Although her unpaid work inside and outside of her home positively contributed to her family's livelihood, and her well-being through nourishment, the opportunity cost which resulted was that she sacrificed time she could have used to work towards her development outcomes if she so chose; though I

acknowledge that if given more time, there was no guarantee she would use it (or be permitted to use it) to work towards these outcomes. But as we will see in our next case study, a longer journey time between home and school is not always necessarily a source of tension between physical mobility and the freedom to choose how to spend time after school.

### 8.3.3 Gloria's Journey Home from School

Of the six research participants observed after school, Gloria had the longest direct journey home – an hour. Gloria's case study was unique because, counter to prevailing logic, her long commute did not seem to be a source of unfreedom for her, as we will see shortly. Whereas other research participants traversed comparatively sparse back roads and footpaths, Gloria lived adjacent to a major thoroughfare. This meant her journey was heavily trafficked by other commuters and the air was much more polluted by passing vehicles:

**Researcher's diary entry March 24, 2014:** *I can't imagine how Gloria copes with this journey every day! By the time we arrived at her home, the inside of my nose was completely black from the soot of motorized vehicles. I wouldn't be surprised if she has occasional respiratory problems. [...] Her friendly nature at school spilled into the walk home, as we were constantly stopped by people she knew from other schools. On three separate occasions we encountered men or boys who tried to playfully grab at Gloria's hand or arm. Although she did not let anyone grab her, she did smile, which makes me wonder if any of these people have a crush on her, or vice versa? What would she have done if I weren't present? I got the feeling from facial expressions and her tone in Swahili that she was cutting at least some of these interactions short.*

During the walk home, Gloria was sometimes slightly ahead of me – her feet seemed to have memorized every change in the sporadically paved path, while mine were notably more cautious in the hopes of avoiding a tumble. Even still, it was apparent that this journey was perhaps the one time during the school day that Gloria felt most free: She did not have to answer to anyone or adhere to a schedule dictated by anyone else. She was not responsible for any tasks during the walk. She stopped to talk to people when she wanted to, engaging in what could be said to amount to social play or flirting. Gloria also browsed some of the numerous market stalls along the way. She walked at whatever pace she felt; the fast-looming sunset did not appear to affect her stride.

This last point for me was quite unexpected, especially in contrast to Leanta's journey, when the darkening sky was used as a time-telling mechanism that hastened her speed against the dangers that nightfall sometimes portends. Gloria enjoyed a high degree of freedom in her practice of quotidian physical mobility, and her journey home from school was unique when compared to the other five research participants who were observed after school. The long journey Gloria made home each day was essentially

transformed from what we might consider a contributor to 'time poverty' (Charmes, 2006), or a shortage of time as a resource to engage in activities of one's choosing, into a source of freedom in how she experienced mobility.

Cresswell and Merriman (2011) argue that "the mobile worlds that are labeled dead, irrational and dysfunctional by transport geographers and others come alive when they become the focus of our attention," (pp. 4–5). When we concentrate on the experience of physical mobility during Gloria's commute, the time spent journeying was unlikely to be something she considered 'dead'. Her unrushed, meandering journey afforded Gloria experiences that she chose to engage in, likely because they comprised her idea of the good life during after-school hours.

Gloria's experience of making the journey home from school serves as a counter-narrative to the predominant portrayal of commuters in transport geography as bored and/or bothered by the demands of their daily circulations (Edensor, 2011). Furthermore, her commute contests quantitatively-oriented notions of mobile human geography which advanced the idea that people seek to move as efficiently as possible when traveling from one place to another (Abler, Adams, & Gould, 1977; Middleton, 2009). Gloria's pace and path demonstrate that the quality of one's commute matters just as much as how long the journey takes.

Moreover, in contrast to Leanta, Gloria's journey home from school was free of the kind of traditional physical mobility constraints imposed on school-aged girls. Porter, Hampshire, Abane, Robson, et al (2010) posit that "power relations shape the precise patterning of individual mobilities and immobilities: who can travel along which streets, using what form of transport, interacting with whom, stopping where. [...] Control over mobility reflects and reinforces power [...]," (p. 3). In this case, Gloria could independently exercise control over her time, which for her could be quite empowering after a nine- to ten-hour day at school where she did not have a similar degree of control and was told what to do.

This slice of time and self-directed movement on foot between school and home is the embodiment of what might be called 'autonomy at the margins'. In this thesis, I will define autonomy at the margins as a positive affective experience in a space which reflects marginalization and therefore would normally be expected to impact the person undertaking the journey in a negative manner. The marginalization here is Gloria's inability to afford faster transport home, and so she is forced to travel at the margins, going by foot through a heavily trafficked thoroughfare that can be unsafe after dark. The positive affective experience here was derived from the autonomy she exhibited through her decision to engage in interactions of her own choosing on her journey home. Having this

autonomy at the margins seemed to enrich her life in a way that taking a speedier form of transport (e.g. a *boda boda*<sup>29</sup>) may not have made possible even if it was affordable to her.

In contrast to Leanta's story, Gloria's narrative describes an urban Kenyan female whose appropriation of commuting time created a space where she could enjoy autonomous leisure time while mobile. Sauvain-Dugerdil (2006) posits that individual travel time and how it is appropriated can serve to indicate the level of one's well-being. For Gloria, the circumstances of her journey on foot seemed to strengthen both her sense of happiness and the enjoyment of autonomy as psychological resources. Interpretation of Gloria's walk in this manner contributes an experience built from direct observational evidence to the emergent area of affective-emotional geographies which explore how the experience of walking makes people feel (Lorimer, 2011). Freedom from burdens and expectations during the time in between her school departure and home arrival, coupled with the addition of the social interactions in which she took part, enabled Gloria to leverage her autonomy at the margins via physical mobility to value time in physical mobility, if she so chose.

#### 8.3.4 Zeituni's Journey Home from School

Zeituni was not one of the six girls whose after-school journeys I retraced. Nonetheless, the journeys of the remaining 16 learners were still explored through the implementation of other research activities. Zeituni's case study was classified as revelatory because it provided insight on a journey taken that was otherwise inaccessible to me given the time and safety precautions that had to be made when deciding with whom to conduct after-school participant observations (see **sub-section 5.6.2.1.**).

Zeituni shared the following story about her after-school schedule during the resource portfolio card game research method in May 2014 while discussing how geographical resources affected her education:

*I live in Namandry and I go home by matatu. So, when I get home, maybe I am tired, and I sleep at 8.30pm. And then my dad wakes me at 10pm to eat. When I wake up, I study a little, until about 11.30pm, and then I sleep.* Zeituni

Zeituni's journey from the *matatu* pickup point nearest to NDSS until the *matatu* drop off point nearest to her home in Namandry took a minimum of 1.5 hours in rush hour traffic conditions, not including waiting time to identify a *matatu* with enough space to carry her. Even though *matatus* are usually perceived as being the most chaotic and time-consuming form of public transportation in Nairobi (Mbugua wa Mungai & Samper, 2006), they represent the next cheapest form of transport after walking.

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<sup>29</sup> This is the Swahili word for a motorcycle taxi. *Boda bodas* can weave in and out of vehicles stuck in traffic jams to transport people home more quickly.

Traveling in a *matatu* during rush hour is an experience overwhelming for the senses and not for the fainthearted: Although I never traveled with Zeituni, on numerous occasions while I lived in Kenya, I took a *matatu* during the morning and evening rush hours. To begin, entering and exiting *matatus* can be a challenge, since the driver does not always completely stop the vehicle to let passengers on or off. Once inside, *matatus* almost always blare loud music. Furthermore, even in the face of government crackdowns on overloaded public transportation vehicles, *matatus* are infamous for cramming as many people as possible into a vehicle, whether there are seats available or not (Mutongi, 2006). After being seated, you must take care to guard your belongings, as carelessness can result in theft. As an example of what can happen on a *matatu*, on one ride I took, a man was speaking on his mobile phone close to the window and soon after, another man ran alongside our *matatu*, grabbed, and stole it.

In June 2014, Wangari told me about how her mobile phone was stolen while she was a *matatu* passenger, and she did not notice at the time that the theft had occurred given how stealthily the thief operated. But not every experience as a *matatu* passenger is negative: During my journeys, I observed people engaging in a wide-range of personal enjoyment activities, including making calls and people-watching. Likewise, Zeituni added a layer of productivity and enjoyment of freedom onto her own commuting experience by engaging in a practice which is increasing in frequency among *matatu* passengers: mobile reading.

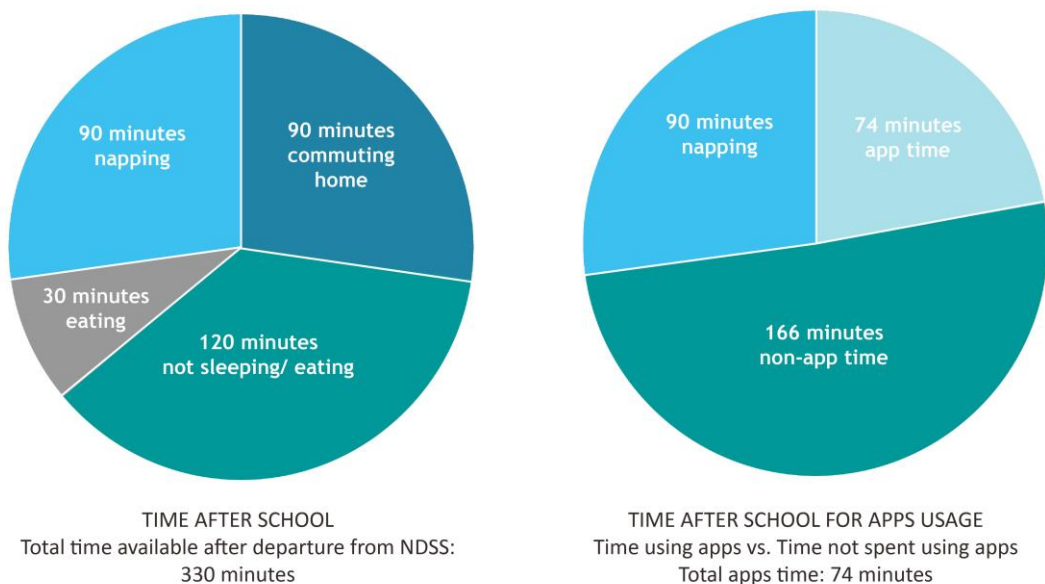
As defined in Chapter 2, mobile reading is reading performed on mobile devices, and even reading performed while the reader is physically mobile. The proliferation of mobile phones in Kenya has contributed to their increased appropriation for reading by people in transit within *matatus* (Musambi, 2014). This example of socially shaping technology provides a visible activity and further evidence with which to refute the notion of commuting being experienced as 'dead time' by the subject (Cresswell, 2010). Contributing to the emergence of mobile reading practice was the introduction of Wi-Fi on major *matatu* routes (Mbuvi, 2013), which helps commuters save money (financial resources) on mobile data usage, especially as *matatu* operators use Wi-Fi as a selling point when competing for customers.

Due to the government policy banning learners from carrying mobile phones to school, it was almost unheard of to see a learner with this technology on school grounds. Although it was uncommon, I was aware that a few girls at NDSS (including those not a part of this study) secretly brought their mobile phones to school for practical purposes, including for emergencies or essential communication with parents and guardians. Usually, if a girl had her phone while at school, it was tucked away in a backpack and turned off or

on silent until they departed for the day. This was the approach Zeituni took, and she told me that she brought her phone to school nearly every day.

During an Intervention phase FGD, Zeituni shared that since being introduced to biNu and Worldreader, she sometimes used her *matatu* transit time to read books. To triangulate this self-reported data, I reviewed her individual app usage statistics. According to the statistics recorded between April and May 2014, Zeituni used the Worldreader app on average 34.4 minutes per day to read books; this reading occurred on weekdays and weekends. During the same period, she used the biNu app an average of 39.6 minutes per day to access and read content on biNu via apps like Facebook, BeSmart, and Wikipedia. However, Zeituni did not always use the apps at home when she studied because they did not contain every book she needed for school. While the app usage statistics (see **Figure 8.2**) do not provide the time of day the apps were used, given the nature of the commute Zeituni elaborated, and what we know about the amount of autonomous time she has available at home after school (approximately 2.5 hours; about an hour after arriving home and then about apart from napping and eating), the app usage statistics provided evidence to strengthen the finding that at least some mobile reading occurred during her journey home from school. However, this cannot be stated conclusively since there was no direct observation of Zeituni’s journey.

**Figure 8.2**



*Zeituni's after-school time use averages, April-May 2014 (Author)*

Some of the book titles Zeituni read (followed by the category type created by Worldreader) included:

- Alkaline Earth Metals (Chemistry),



- Kuku Paka recipe (Cooking),
- The Hits That You Gave Me (Poetry),
- Fairy Cakes (Ages 6-12), and
- Adolescence Is Just One Big Walking Pimple (Quick Reads).

This diverse collection of topics and subjects exemplifies the variety of the educational content they had a choice to access after school once biNu and Worldreader were introduced. This also bolsters the point I highlighted earlier that content geared towards formal learning on its own was not enough to sustain the girls' interest for the entire study. Instead, the unexpressed intrinsic motivations behind the desired development outcome to have choice to IATECAS actually included non-formal and informal learning content types as content the girls sought and valued.

The exceptional nature of Zeituni's journey home from school manifested in three ways, which will now be analyzed using the Choice Framework:

1. She had money (financial resources) to ride the *matatu* home.
2. She had use of her mobile phone (material resource) during the *matatu* journey most days.
3. The long commuting time afforded her an opportunity to engage in mobile reading (educational and geographical resources, and time), and she chose to engage in this activity sometimes.

Whereas a long commute home, particularly in the *matatu* conditions described earlier, might usually represent negative geographical resources that limited the ability to enjoy freedom, in Zeituni's case, her commute created a space for her to use the time spent journeying in a manner that she chose and valued for increasing her access to educational content after school. When Zeituni said she went "home by *matatu*", she was not only sitting and being shuttled from one point to the next. Rather, she was sitting and sometimes engaging in mobile reading while her body was in motion as the vehicle itself moved. Like an experienced *matatu* commuter, she also likely tuned out the loud music that might have been playing during the journey as she became engrossed in whatever she was doing with her mobile phone. This activity was masked in her initial retelling of her journey home, most likely because she may have viewed this as a passive and/or common activity among *matatu* passengers that was not significant enough to mention. Zeituni might have even worried that she would get into trouble if she revealed in front of her peers that she brought her mobile phone to school because of the government ban.

The case study of Zeituni's journey home from school raised a noteworthy tension. Because she could afford to ride a *matatu* home, and she was one of only two research

participants that had an Android-based smartphone, it was clear that Zeituni's socioeconomic circumstances were not as precarious when compared to most other research participants. Although she was by no means wealthy, her household still had the resources to provide her with conveniences that many girls in the school community did not have access to. Despite the lengthy time traveling between school and home, and because she could commute in a manner where it was possible to use her phone to read, Zeituni had a distinct advantage in using her commuting time to work on realizing her desired development outcomes, if she so chose.

The asymmetry in the physical mobility exhibited on their journeys home from school meant that the amount of freedom the girls enjoyed during after-school hours varied markedly. The combination of resources (at a minimum, geographical, material, and financial resources, along with time) Zeituni had on her journey home from school facilitated choice to work on her desired development outcomes for more time than most other research participants. Nevertheless, we saw that Gloria also exhibited a type of freedom in time management given her longer journey home and how she chose to spend that time.

The varying degrees of freedom in physical mobility after school among the research participants suggested that the secondary development outcomes realistically achievable on an individual basis during the study, predicated in part on obtaining and sustaining the choice to IATECAS, was also diverse.

### 8.3.5 Connecting Physical Mobility, Time, and Secondary Development Outcomes

When an NDSS learner made the journey home from school, the interaction of structural elements and resource-based agency components was co-defined not only by time but also by geographical resources (the distance between NDSS and her home), financial resources (needed for the possibility of faster transportation), and informal norms (related to expectations of girls' performance of domestic responsibilities after school while in transit). The journeys home from school taken by Leanta and Gloria were both different in length, routes taken, activities engaged in, and tempo; Zeituni's journey was also distinct because she took a motorized form of transport. The journeys also varied in terms of the amount of freedom each girl appeared to enjoy during the experience of being physically mobile: Leanta experienced the least amount of freedom as she made her way home. This meant that the in-between time when she traveled was a period when she could not activate autonomy at the margins to do as she pleased. This lack of freedom to control her time while physically mobile reflected the limited ability she had to work towards her secondary development outcomes once she was at home as well, as seen in Chapter 7.

Because Gloria had a journey free from domestic responsibilities, she shaped her commuting experience in her preferred manner. Gloria's journey did not include mobile phone use while in transit because it was difficult to navigate hazards during her journey, and because she chose not to carry her mobile phone to NDSS. Yet, the significance of Gloria's journey with respect to her secondary development outcomes was that, just as she could exercise control over her commute, she also had the freedom to control her after-school time use once she arrived home. Once home, as seen in Chapter 7, she did make the choice to use her mobile phone, including to IATECAS sometimes.

Zeituni chose to use her time during the long *matatu* commutes to engage in activities with her mobile phone that helped her pass time and increase her access to educational content after school. This could have contributed to the realization of her secondary development outcomes by enabling her to also work towards improving her grades and strive towards academic success through the content she perused. Moreover, Zeituni's physical mobility freedom was similar to the freedom she stated she had at home. This claim is evidenced by her self-report that she chose to nap of her own accord and appeared to have few domestic responsibilities apart from her studies after school.

These three case studies help illustrate how the experience of physical mobility intersected with time as a resource, geographical resources, and informal norms (especially in Leanta's case) during the journey home from school. The commingling of these factors along with other structural elements and resource-based agency components during after-school hours manifested in a way which meant some learners were undoubtedly better placed than others to realize the development outcomes articulated earlier in this chapter. These findings suggest that opportunities to improve grades and achieve academic success (the girls' expressed secondary development outcomes) was partially dependent on physical mobility (un)freedoms – a connection infrequently examined in literature on the formal schooling experiences of children in the Global South (for exceptions see Benwell, 2009; Gough, 2008; Gough & Franch, 2005; Langevang & Gough, 2009; Porter, Hampshire, Abane, Munthali, et al., 2010). Understanding the significance and relevance of physical mobility to the girls' after-school freedoms was therefore crucial as I considered evidence to assess if the girls had realized their desired secondary development outcomes by the end of the study period.

#### 8.4. Virtual Mobility Experiences

In the previous section, we examined how physical mobility impacted the NDSS learners' after-school abilities to work towards their secondary development outcomes. Through evaluation of the AR process, one other form of movement emerged and impacted the girls: virtual mobility. As defined in Chapter 3, virtual mobility is movement that people

realize with and through ICTs. In this section, we will examine how movement, mostly imagined in nature, facilitated via mobile networks combined with time to influence the realization of development outcomes. To do this, I will share and critically interpret imagined and educational content-based journeys undertaken through biNu and Worldreader. Specifically, I will highlight why some participants chose to use the two apps as at-home learning tools when circumstances arose which prevented their school journeys.

#### 8.4.1 The Journey from Home to School

Although it was not possible or reasonable to stay overnight to conduct direct observations with participants in the morning, the girls recounted their before-school schedules during the Pre-Intervention and Intervention research phases across multiple research methods. Beginning at 4:30am, many of the 22 New Day Secondary School research participants awoke to prepare themselves for the journey from home to school<sup>30</sup>. Owing to Nairobi's proximity to the equator, the sun rises between 6:30am and 6:12am each day (timeanddate.com, 2014a, 2014b). NDSS learners were required to arrive at school by 6:30am to perform school chores and prepare themselves for instruction which commenced by 7:30am. This meant that most of the research participants – depending on where they lived – completed at least part of their journey in darkness. If the journey to school was made by public transportation, leaving home at 5:30am invariably meant bad traffic. Around the area of NDSS, one also encountered traffic congestion when traveling by foot, as hundreds of people made their way to markets, schools, and work.

Over the course of this study, it became apparent that many girls at NDSS were unable to consistently make the journey to school. A common reason to miss school was non-payment of school fees. While there was some flexibility offered in the form of payment plans, the precarious livelihoods of parents and guardians meant that even paying school fees in micro-installments was often a struggle. Poor health also emerged as a recurrent challenge. Poor healthcare access combined with limited financial resources to pay for a doctor sometimes resulted in tragic circumstances: A total of four girls out of a student population of 400 died during the 13 months I implemented this study. Many others became gravely ill with conditions ranging from diabetic shock and a hemorrhagic peptic ulcer, to malaria and food poisoning. The effects of their menstrual cycles, complicated by a lack of access to affordable sanitary products, was still another health-related attendance issue. Put simply, when the girls had illnesses that might affect their in-school performance, they usually stayed home.

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<sup>30</sup> Ada was one exception, stating she woke up at 6:00am since she lived so near the school and had little in the way of domestic responsibilities each morning.

Teacher strikes were another source of interrupted school journeys. For the three years that I worked with the NDSS community<sup>31</sup>, teachers went on strike every year, sometimes more than once a year. The strikes disruptions lasted for at least a week. When the teachers were not at school, the learners were not permitted to be on campus, so the decision not to journey to school was fully beyond the girls' control when this happened. One other barrier to school attendance that arose was family strife. Life for poor people who are bound by structural injustices which limit their choices, and a lack of resources which negatively impacts their ability to lead the lives they value, is undoubtedly challenging. When families fall upon hard times, for instance when they experience unemployment of a primary income earner, it is often the girl children whose fees for school enrollment are sacrificed to help make ends meet. As is sometimes seen in informal settlements in Nairobi, girls are made to stay home when this happens, also so that they can contribute to domestic labor. This in itself is another barrier to school attendance (Elimu Yetu Coalition, 2005). The gendered dimension to this immobility is reflective of the prevailing structural norms which comprise and shape girlhood in this context.

These school attendance barriers meant that the girls in this study sometimes undertook imagined digital journeys via mobile and through educational content to maintain their ability to connect in some way to their school when physical mobility for the journey was rendered an impossibility. Although the above list is not exhaustive, the complications I will now explore demonstrate the varied nature of school attendance barriers among students in the NDSS student population, and the reasons why virtual mobility was undertaken at times after biNu and Worldreader were introduced.

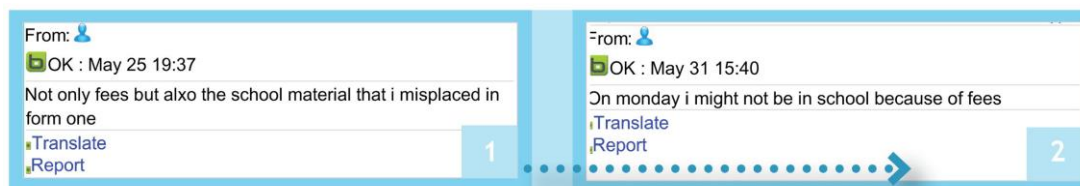
#### 8.4.2 School Fees

Non-payment of school fees was perhaps the most common reason why a research participant was unable to make the journey from home to school. Exceptions were occasionally made if a school faculty or staff member pleaded the case for a girl, usually based on her academic talent and her promise to make the payment at an agreed date. Alternatively, they sometimes raised money on the girl's behalf in a show of compassion due to unforeseen circumstances. However, many learners journeyed to school without fee money, only to be turned away by the school bursar. The standard practice at NDSS is that there is no grace period for making a school fees payment. Here, some girls share their experiences of interrupted school attendance due to non-payment of fees:

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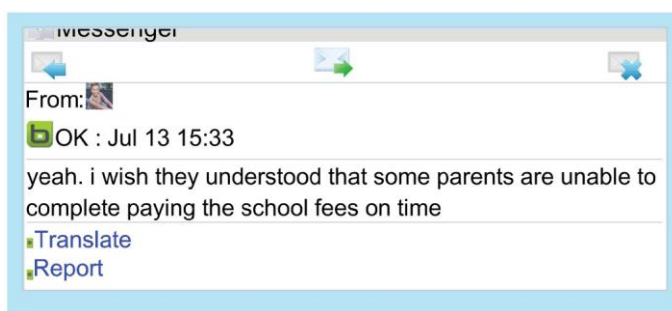
<sup>31</sup> I first started working with NDSS in May 2012 when I initiated my MSc research. I returned to Kenya at least once a year until January 2015 when I concluded the fieldwork for this thesis.

## Plate 8.1



*Lupita's May 2014 absences due to school fees (Author)*

## Plate 8.2



*Zeituni seeks compassion for a school fees-related absence (Author)*

Above, Lupita shared that she missed school because her parents did not pay her fees. She also noted that because she lost a school-issued textbook the previous academic year, she owed money to replace it. Though she had two parents in formal employment, Lupita's household resources were constrained because at least two girls were being sent to secondary school. Lupita later explained to me that her father had not been paid by his employer on time and this had a negative effect on the household's finances for the month of May 2014.

Since Zeituni appeared to be from a household with more financial resources available when compared to other research participants, she did not herself experience being sent home for non-payment. Instead, we see that she is expressing compassion for her peers who were not as fortunate, regretting that the circumstances of some parents mean that on-time payment is not always feasible, and moreover that the NDSS faculty and staff should understand that. Zeituni's statement adds further evidence to my assessment in Chapter 4 that many families in the NDSS community experience socioeconomic deprivation. Most are not immune from the periodic employment-related livelihood shocks that can make a family short of funds they need to keep their daughter in school.

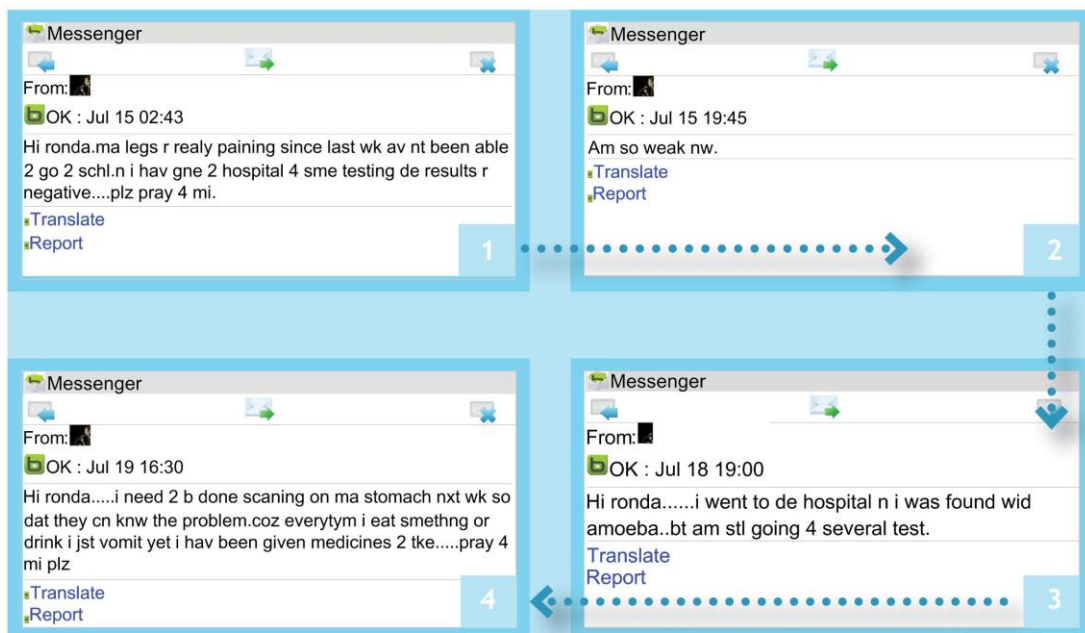
Lupita's situation and those like her is difficult because, as outlined in Chapter 4, in 2008 the Kenyan government promised to eliminate secondary school fees. However, when the principal showed me the operational budget for the school and the amount she received from the government, there was a gap totaling over 15,000 Kenyan shillings (or about US\$171 at the 2014 exchange rate) per student, per year needed to run the school.

Also noted in Chapter 4, the annual cost for a student to attend NDSS at the time of the study was 25,000 Kenyan shillings. The funding shortfall was then passed on to the learners' families, many of whom had multiple children to put through school. Therefore, paying an NDSS learner's school fees could sometimes be a substantial burden on the financial resources available in a household. This strain results in late payments, girls being barred from attending classes, and absences from school can last for weeks – and in some extreme cases even months. Previously, this financial resources-related stress surfaced fears about how the girls would catch up with their peers who had not been barred from school (Zelezny-Green, 2014).

### 8.4.3 Illness

As mentioned earlier, poor health was a common reason for missing school. In the girls' own words, here are two of these experiences with this immobility source:

**Plate 8.3**



*Susan's health challenges (Author)*

**Plate 8.4**



*Gertrude's health challenges (Author)*

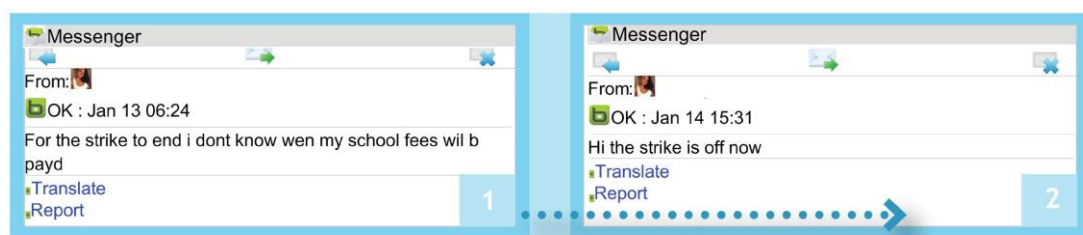
Susan and Gertrude's health problems lasted for more than a week. The state of healthcare delivery for people living in urban Nairobi, particularly informal settlements, is characterized by numerous issues that are normally only avoided by paying for care that is unaffordable for most NDSS households (Gulis, Mulumba, Juma, & Kakosova, 2004). For

those who cannot pay, substandard care is the norm: Susan’s condition went undiagnosed for more than two weeks because accurate testing mechanisms were unavailable; the ones with more precision available in private hospitals were too costly for her family. When an NDSS learner fell ill, her condition was usually exacerbated due to worries that she would fall behind in school due to her immobility.

#### 8.4.4 Teacher Strikes

The next barrier to consistent school attendance were teacher strikes. The strikes originated from an unfulfilled promise the former president Moi’s government made in 1997 to gradually increase teachers’ pay (Kenya National Assembly, 2002; Kweyu, 2015). Strikes in recent years have intensified in length and frequency, now occurring every year since 2012, at least twice a year. When teacher strikes occurred, initially NDSS students were permitted to attend school and instruct each other in the hope that their teacher might come to work that day. As time passed and it became less likely the strike would end within a week, Principal Sumba officially announced that the girls should not come to school until further notice. This meant that learners then had to try and learn what they could from home.

#### Plate 8.5



*Gertrude’s experience with strike-induced mobility (Author)*

The strike Gertrude referred to lasted for eight school days. She also noted that even once the strikes were over, she was not likely to have the financial resources to pay her school fees. The year prior, teachers went on strike for nearly a month, resulting in the indefinite closure of primary schools, although this was eventually reversed (BBC News, 2014). Because teacher incentives in Kenya remain low (Glewwe, Ilias, & Kremer, 2008), and the government continues to state it lacks the funds to better compensate their employees, teacher strikes have become the leverage teachers use to try and get their pay demands met. The people who are perhaps affected most by strike action, however, are the students since teachers usually get back-pay once the strike is over, even if they are not successful in securing the promised pay raise. Once the strike ends, learners do not recoup the school fees lost for the days they could not attend school *and* must cope with a compressed teaching schedule which provides no additional time for learners to be taught the material meant to be covered during the strike. For a student like Gertrude who was

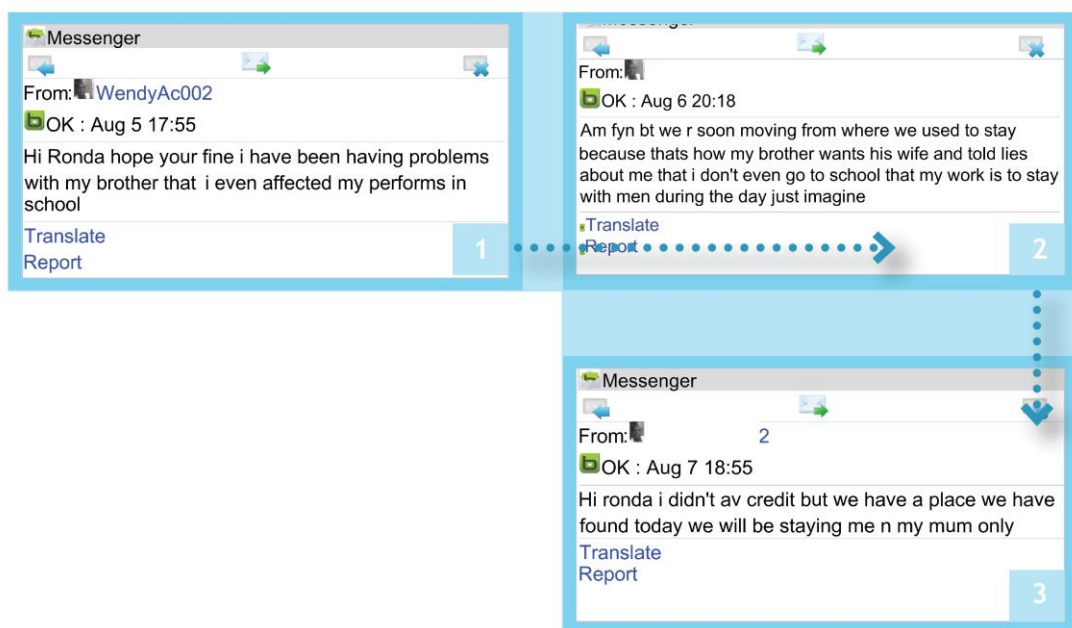


certain to miss school days beyond the strike, the compressed schedule squeezed her further still.

#### 8.4.5 Family Strife

One last challenge I will consider in making the journey from home to school is family strife. Sources of family strife in Kenya can spring from domestic violence (Mudege, Zulu, & Izugbara, 2008) and alcoholism (Mugisha, Arinaitwe-Mugisha, & Hagembe, 2003), among other causes. Girls in particular can be subjected to domestic difficulties which arise from gendered norms and interrupt their school attendance, as was seen with Leanta on one occasion<sup>32</sup>:

#### Plate 8.6



*Leanta recounts a school interruption experience derived from family strife (Author)*

As discussed in sub-section 7.5.2., although the nature of the intervention was explained to parents and guardians, when I conducted an after-school observation with Leanta in May 2014, her older brother questioned why his younger sister was using her phone so much more. Because their father had passed away and he earned the most money, Leanta's brother was the de facto head of the household and had the power to monitor her after-school activities. He assumed that the phone was being used to chat more with males, and not for purposes he might approve of, such as learning. Leanta's mother did not seem to share the same assumptions or attitude towards her daughter's mobile use: She stated on an after-school visit that she and Leanta used Worldreader to access the Bible together when they attended church.

<sup>32</sup> Translation of Leanta's second biNu message: I am fine but we are soon moving from where we used to stay because that is what my brother wants. His wife told lies about me: That I don't even go to school. That my work is to stay with men during the day. Just imagine.

The prevalent, often negative discourses about the purposes girls in the Global South use their mobile phones for (Mokake, 2009) can cause major upheavals at home. Porter et al. (2011) also note that children, especially girls in developing contexts, are frequently surveilled by authority figures in their lives, sometimes via mobile phones, to ensure they adhere to expected informal norms. These norms are often related to what is deemed to be “good” behavior (Cobbett, 2014). This surveillance is certainly not foolproof in terms of the evidence it yields, and mistaken information can be a source of domestic disputes which interrupt school attendance.

In Leanta’s case, her brother’s suspicions about what she did with her phone were inflamed by gossip shared by his wife; this led him to force Leanta and her mother from their shared home. He took this action because he believed Leanta was being truant from school to interact with males. Because of her homelessness, Leanta missed school days to help her mother find new housing for them. In the end, Leanta lacked stability at home which had negative consequences for her school performance, her ability to increase her access to educational content after school, as well as her potential to achieve the improved grades and academic success she sought.

The role of this intervention in what happened to Leanta is debatable. By the time Leanta was kicked out of her home, Angela and I had visited her home for a total of ten days (five school days during Terms 1 and 2). During after-school observations I led, I took care to show Leanta’s brother what she was using her mobile phone for, and offered to install the app on his phone. It could be that even if I said the tools were for educational purposes, he did not believe me or just did not agree with Leanta’s mobile phone use altogether. Because his mother gave permission for Leanta’s research participation, it is also possible he felt his authority had been usurped to make an important decision. Of course, it is also possible that Leanta was chatting more to males with her phone. However, as far as the accusation of truancy was concerned, Julie the teacher confirmed that Leanta had not missed school in the period before her brother kicked her out of her home.

After the incident was brought to my attention I had discussions with Julie and Leanta by telephone. Neither mentioned the apps when explaining why these events occurred, even though usually, if there was an issue because of the study, Julie would share that information with me. This situation underscores the need for ongoing reflection and clarification during the AR process to ensure that, from an ethical standpoint, a researcher is not unintentionally introducing conditions which might cause a research participant harm. While I cannot say with certainty that the above events with Leanta are unrelated to the intervention, the app usage statistics showed she sustained her mobile use through December 2014. This suggests that the circumstances were unlikely to be directly related

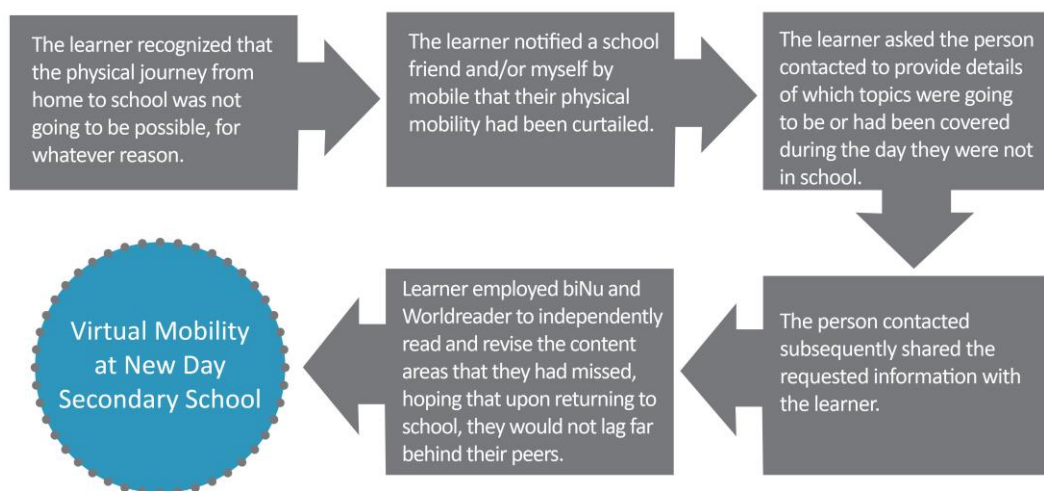
since in that case I would have expected this incident to stop her use altogether. Also, as noted in the third message of the sequence in **Plate 8.6**, she kept her access to biNu going because she had the financial resources to do so and the social norms in her new home with her mother made such use permissible.

#### 8.4.6 Mobile Reading Journeys

Messages shared via biNu messenger in the previous sections are examples of the girls' mobile phone appropriation to communicate with me at a distance. However, the messages they shared were not because I asked them to write when they were absent from school, but rather messages sent to maintain contact with the place they wanted to be but could not: NDSS. These messaging instances were initiated primarily so that the girls could share their status with me and their peers, and to ascertain what was being taught in school. The evidence I will now present and analyze suggests that the goal they seemed to have in mind was to mitigate the impact of interrupted school attendance by engaging in mobile reading for the content missed in school.

The girls in this study who became mobile through an ICT medium (mobile phone) when they could not make the journey from home to school did not attend online classes in ways that are usually considered to be a type of virtual (and mobile) learning practice (Pachler, Bachmair, & Cook, 2010). However, biNu messenger appropriation to contact me and their peers when circumstances impeded their physical mobility to attend school in some cases eventually led to the emergence of imagined virtual mobility through mobile reading practice linked to these absences. In **Figure 8.3**, I present an overview of how virtual mobility through mobile reading came about in this study:

**Figure 8.3**

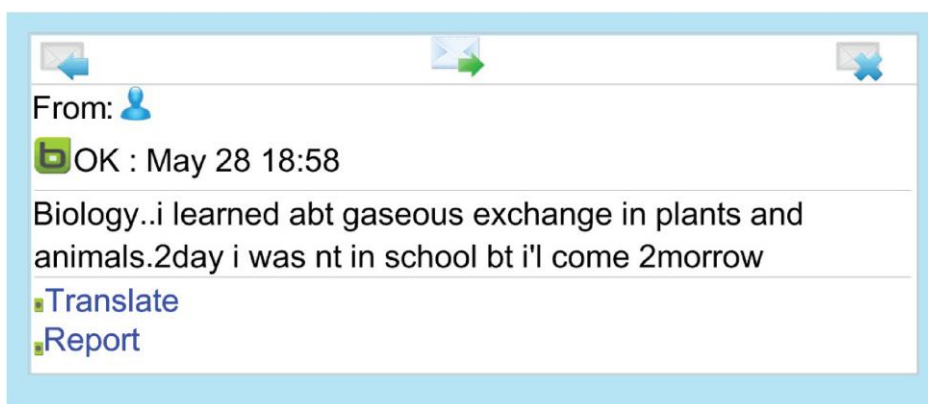


*Steps taken by research participants to use virtual mobility to mitigate interrupted school attendance (Author)*

Given the lack of books and other potentially educational media observed after school in the homes of six research participants, it can be reasonably assumed that once

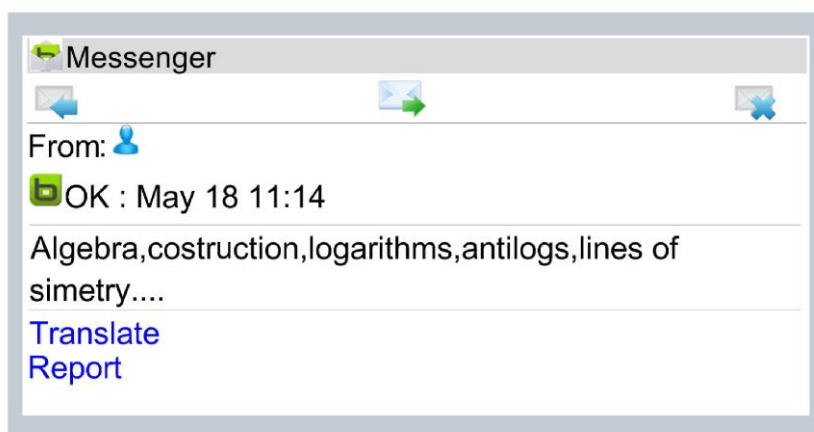
some girls who were immobilized at home were notified what had been covered at school, they realized they now had a choice to use biNu and Worldreader as mechanisms to access educational content relevant to their formal schooling. However, this practice of independently exploring what had been taught at school was dependent, at a minimum, upon: their phone and the two apps functioning (material resources and norms to access them), skills and confidence to use them (educational and psychological resources), having a network signal (geographical resource), and having mobile data credits (financial resource) to access the apps. Of course, as seen in Chapter 6, there were also many structural elements to contend with. Even still, I documented examples of this practice during the study (see **Plate 8.7** to **Plate 8.10**).

**Plate 8.7**



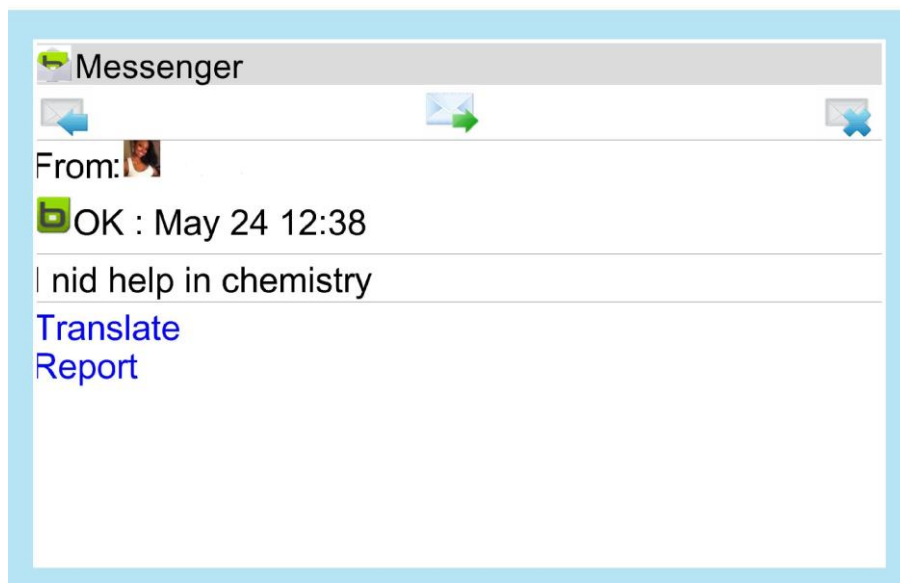
*Faith's reported use of Worldreader on a day she could not attend school (Author)*

**Plate 8.8**



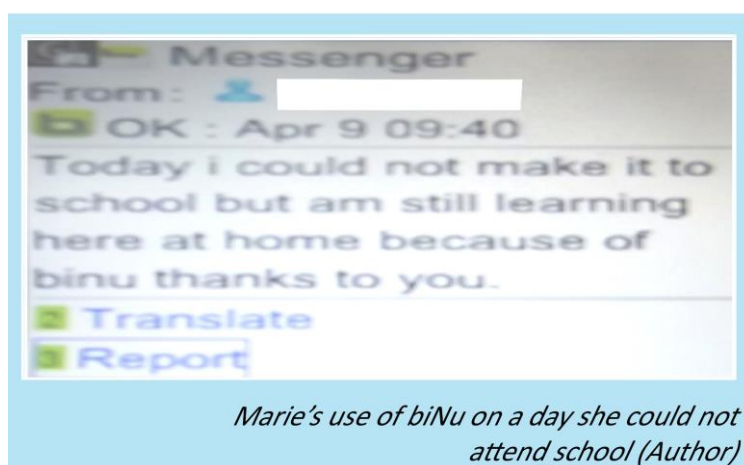
*Everlyne's weekend use of Worldreader when she had been absent for a week due to non-payment of school fees (Author)*

### Plate 8.9



*Gertrude's request for guidance in accessing Chemistry books on Worldreader during a period she was absent from school for two weeks due to her sponsor's inability to pay her school fees (Author)*

### Plate 8.10



*Marie's use of biNu on a day she could not attend school (Author)*

In **Plate 8.7**, Faith and I exchanged messages because I did not see her on the NDSS campus that day. I noticed her absence because she was one of the most vocal and chatty research participants. She shared what she had read on Worldreader and confirmed that she had not attended school. In a review of the app usage statistics for the date of the biNu message exchange, I saw that Faith had read *CK-12 Biology Concepts*, which introduces basic biology concepts and what it takes for plants and animals to live. This data triangulation was strengthened further when the biology teacher at NDSS confirmed the next day (Thursday May 29, 2014) that in his class the previous day, he taught about gaseous exchanges in plants and animals.

The start of new school terms at NDSS were usually characterized by several girls missing the first few days and even weeks due to non-payment of school fees. By the time

of their messages in the second half of May 2014, Everlyne had missed two weeks and Gertrude had missed three full weeks of school. In parallel, the 22 research participants were using biNu to send me and each other messages at least once a week. When she returned to school, Everlyne alerted me that she had contacted another NDSS learner to find out what topics had been covered the two weeks she was kept from school, including algebra and geometry. Her message above restates the topics she was told, algebra, logarithms, and lines of symmetry among them. Gertrude's message highlights that she wanted my help locating any relevant chemistry books in Worldreader, as I was later told, after she learned from a peer what content was being covered in her chemistry class the days she was absent.

To triangulate this self-reported data, I examined the individual app usage statistics for these girls. Everlyne read books Worldreader categorized in Geometry and titled *Corresponding Angles*, *Area of a Circle*, and *Area of Composite Shapes Involving Triangles* around the same time that Zeituni read the same books. Zeituni was also in Form 3 and grouped in the same class as Everlyne, but she had not missed school during this time. Although Zeituni may not have been Everlyne's source for what was being taught in school at that point in time, the similarities in what the two girls read and the timing suggests that Everlyne's self-reported statement about what she was reading was likely true, and that it was done because this was what was being covered in her math class with Zeituni at NDSS. Gertrude's request for help with chemistry revealed that she read books in this subject near the time she had been unable to attend school. The books that Gertrude read and that Worldreader categorized as Chemistry included *Boyle's Law*, *Acid-Base Neutralization*, and *Balancing Chemical Equations*.

Marie's message does not specify what she was learning about but does tell us that she too had missed school and was likely using biNu to engage in imagined virtual mobility through mobile reading to mitigate the impact of this absence. A check of her app usage statistics showed that books Marie read around that date included the following titles: *Diffusion* (Biology) and *Accuracy and Precision* (Physics). However, she also read the title *Wonder Book of Bible Stories* (Bibles).

As I explained in sub-section 2.4.1.3., mobile reading is a subset of mobile learning. Although the time spent reading a book is no indication that learning has occurred or if what has been read was understood, the amount of time spent with the book still provides insight into the girls' level of engagement with it. The number of page views of an m-book (please see **sub-section 2.4.1.3.** once more for the definition of this term, but in brief an m-book is a digital book accessed through mobile) is also a measure of the engagement with a text in the sense of how far a learner progressed in reading the text. Examining more

granular data about the four girls' mobile reading activities, **Table 8-2** shows the learner, book titles read, total time spent reading a book, the number of page views per book, and whether a book was read in its entirety or not.

**Table 8-2**

Learner	Book Title	Time Spent Reading Book (in minutes)	Number of Book Page Views	Book Read in Full? (Yes/No)
Faith	CK-12 Biology Concepts	74.08	80	No
Everlyne	Corresponding Angles	0.07	1	No
Everlyne	Area of a Circle	1.52	18	No
Everlyne	Area of Composite Shapes Involving Triangles	0.12	3	No
Gertrude	Boyle's Law	5.12	69	Yes
Gertrude	Acid-Base Neutralization	23.52	82	Yes
Gertrude	Balancing Chemical Equations	11.80	87	Yes
Marie	Diffusion	1.87	42	No
Marie	Accuracy and Precision	13.07	38	No
Marie	Wonder Book of Bible Stories	9.28	17	No

*Worldreader usage statistics for Faith, Everlyne, Gertrude, and Marie on days they were absent from school in April and May 2014 (Author)*

From the data above, we see that perhaps Gertrude was highly motivated to understand more about the topic she had missed in school since she read all three chemistry texts in full. The amount of time she spent reading the texts highlights that the book lengths varied quite a bit since one was read in just over five minutes, another in just under 12 minutes, and the last for over 23 minutes. But it is also possible that she read some titles faster than others, or that she scrolled through *Boyle's Law* more quickly than the other two texts. Faith may not have read the biology text in full but she spent more time reading it than all the books that Gertrude read combined. This makes sense because not every book available on Worldreader has the same length and this biology text was particularly dense in content when I accessed it. Faith may not have finished her book because it was very long or because she read until she had found the information needed.

Of all the learners, Everlyne appeared to have the least use made of the books she read when she was absent from school. She spent less than two minutes combined on reading the three books she opened. Since the *Corresponding Angles* title has only one

page view, it could be that she accessed the text and saw from the first page of its description that it was not what she was searching for. The other books could have been evaluated in the same way, or she may even have had to cope with time limitations, a lack of financial resources for the mobile phone credit needed to browse Worldreader, and/or social norms that may have caused her to use the phone less that day or in a hurry. Based on my analysis of the app usage statistics data for all 22 learners as an aggregate, Marie's use patterns were most typical of usage patterns than those of the other three learners; she did not finish any of the books she read, or perhaps read them selectively, but the number of minutes for which she read the three books and the number of page views accrued is an indication that she was engaging with the texts.

Following the same protocol used with Faith to establish another point from which to triangulate the self-reported data and app usage statistics, I spoke with Everlyne, Gertrude, and Marie's teachers for the respective subjects they perused through an m-book. The lesson plans I reviewed for these days either specifically covered topics these three girls read or shared topical links that meant it was useful to read books which were related.

During the workshops where I introduced the two apps and later helped them enhance their skills in appropriating the apps, I suggested that when the girls needed extra help to understand a topic, they could try looking for a book on the topic in Worldreader or searching apps within biNu to see if the content they need might be available there. This instruction was likely part of the foundation for the practices observed here, although this is uncertain since, as I explained section 7.3., there was an extant practice among some learners of "googling" to find information when it was needed. However, while it may have not been novel to teach the girls how to find information, what was an innovation was that this instruction for finding and accessing information they needed was for searches conducted with mobile phones and through two apps that were new in this context and allowed access to further educational content.

Virtual mobility as imagined travel through mobile reading with Worldreader appears to have been part of the practices some girls undertook when their physical mobility to attend school was prevented. In some instances, content was sought on Worldreader in line with the topics taught in school while the girls were absent. This pointed to a motivation for why the *sense, use, and achievement of choice* were experienced by some participants in this intervention over time. By attaining choice as the primary development outcome to increase access to educational content even when they were not present in school, a new pathway could then have been created for realizing the secondary development outcomes of improved grades and eventual academic success.



However, there is no automatic chain of causation, just the possibilities of marginally improving conditions which were not very conducive to learning. Given the previously limited availability of sources from which the girls could access educational content after school (see **section 7.6.**), it is likely that a byproduct of the achievement of choice and the realization of choice to IATECAS as the primary development outcome was that the girls now had the opportunity to search more sources (biNu and Worldreader) for the information taught when they had missed school.

#### 8.4.7 Deconstructing Mobile Reading Activities at NDSS

Based on work towards building a theory of mobile learning that draws on links to activity theory, Vavoula (2004) proposes that when there is a challenge to be overcome, a person's learning needs are most likely to become apparent through the activities they choose to engage in to respond to the challenge faced. Interrupted school attendance qualifies as a challenge. The learning need that seemed to be reflected by the activities the girls carried out with their phones and the apps is the attempt to keep pace with the formal learning curriculum when circumstances prevented physical mobility – a direct response to mitigate their challenge. Though this activity would be classified specifically as imagined virtual mobility through mobile reading and not more broadly as mobile learning since there is no way to discern that the girls acquired knowledge during this process, it is nonetheless a practice which indicates proactive work to avoid being left behind in their formal schooling.

As has been seen elsewhere (Caribou Digital, 2015; Ling, 2007; Sey & Ortoleva, 2014), contacting peers by mobile to learn what was missed in school is one of the most rudimentary ways for an NDSS learner to travel virtually in an attempt to counteract the negative impact of interrupted school attendance. The autonomy NDSS learners exercised at the margins when they were home but in cyberspace was unfortunate given their desire to be in school. However, it provided evidence of the girls' innovation (educational resources), resilience (psychological resources), and their determination to use their material resources (biNu and Worldreader) to realize their secondary development outcomes of improved grades and academic success. Furthermore, this mobile technology appropriation demonstrates a sophisticated set of learning activities and strategies for mobile usage among girl children in a developing context (Ling & Horst, 2011; Porter, 2012).

Nevertheless, as I foreshadowed earlier, these experiences of imagined virtual mobility were not realized evenly among all research participants. At least five girls, Shikoh, Beryl, Linda, Ann, and Ada, did not maintain the ability to engage in virtual travel of this nature throughout the study<sup>33</sup>. Ada's barriers have already been discussed in sub-section

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<sup>33</sup> Recall from Chapter 7 that Lupita stated that she kept using biNu, just not as a logged in user because her SIM card somehow technically prevented her from doing so.

7.5.4., so I will not review them here. Using self-reported data, statements from other NDSS community stakeholders, and after-school participant observation notes, I will now briefly explore the circumstances of two of the remaining four girls: Beryl and Linda.

Beryl and Linda appeared to have the most unstable domestic situations among the 22 girls. Although Beryl was not observed directly after school, I learned of her plight through discussions with Julie, remarks from other research participants, as well as her own admissions. On one occasion, Beryl did not go home to sleep because she feared a beating from her guardian for arriving too late. When she returned home the next day, an argument still ensued. When Beryl was at school, she was suspended at least three times within a seven-month period while I was present for behavior deemed to be unbecoming of an NDSS student (truancy, spreading gossip, and being accused of stealing another girl's diary). All of this meant that Beryl's mother did not often give her an allowance (financial resources) and her mobile phone (material resource) was often taken away as a punishment.

In Linda's case, one day after school she was locked outside of her home for over three hours. She had to wait for her two uncles to return home to let her and Angela inside since she had not been given a key. By her own account and in the observation notes made by Angela, Linda's uncles treated her poorly, offered her few resources to support her, and rarely spoke to her; when they did, their tone was perceived to be harsh. If an accurate portrayal, this behavior could be explained by the uncles being made financially responsible for Linda's needs when they did not want this responsibility. At school, Linda was usually withdrawn.

Given these circumstances, it was unsurprising that Beryl and Linda's online activity during the study was negligible. The power that the adult stakeholders held over these girls' lives unarguably constrained their freedoms in a manner that had implications for their present, and likely for their future capabilities – even if the apps are not taken into consideration.

To take a holistic view at what transpired during this study, it is plausible to think that the research participants may have valued a connection between their offline and online worlds because it allowed them to maintain a semblance of school attendance continuity. It could also be demonstrative of a degree of agency when otherwise there was nothing they could do about their circumstances. Although this is a poor substitute for the "real world," or in-person formal education participation, the girls might argue that the alternative is worse still: falling further behind academically without access to this information.

Use of the mobile media in this intervention may have created some sense of inclusion that was then taken to counter the exclusion felt when school attendance was prevented – even if both the girls and I recognized that these actions were not a sustainable substitute when formal education participation is desired. Nonetheless, even if a sense of inclusion was achievable through these digital means, this could only occur if the girls had the time and the material, financial, educational, psychological, and geographical resources to activate their virtual mobility. The structural elements surrounding this virtual mobility also had to be favorable.

These scenarios add evidence to the argument that serving the poor using ICTs as a vehicle is a complex undertaking that is not always guaranteed to help realize stakeholders' desired development outcomes – even when more people-centered approaches are taken (Unwin, 2009). They also show that ICTs can be both a source of inclusion and exclusion in contexts where levels of marginalization already existed (Heeks & Kanashiro, 2009). Appropriating ICTs to help girls gain virtual access to information previously inaccessible undoubtedly has its advantages for the people who are already well-positioned to make this choice. However, for those who are not in a similar position (i.e. the study participants who faced myriad structural barriers and resource constraints to IATECAS), their participation in a community where others benefit from the introduction of a technological innovation while they do not can surface tensions that should be addressed not only through resource expansion but also through structural change.

The autonomy at the margins documented in this exploration of virtual mobility shares parallels to those seen with the journeys of physical mobility which were discussed in section 8.3. These findings emphasize that the physical and the virtual should be examined alongside one another to make visible the related links, if any, between the two spaces. Furthermore, when examining an individual's circumstances to bring about desired change, structural elements and the resources which form the basis of agency should never be considered in isolation from each other. This is because these elements and resources are linked and would have to work in concert to promote choice, autonomy, and freedom in physical and virtual mobility in ways that might not have been previously thought possible. Likewise, alternative combinations might produce opposite and undesirable effects for mobility as well.

In the penultimate section of this chapter, I will assess and debate the efficacy, if any, of the intervention with the aim to understand if it contributed to the realization of the two secondary development outcomes: improved grades and to have academic success.

## 8.5. Mobilizing After-School Development Outcomes?

As I discussed in previous chapters, the research approach adopted in this study is one that puts people first. Accordingly, the secondary development outcomes were created by the 22 girls at New Day Secondary School based on their thoughts of what constituted a good life. The primary development outcome to have choice to increase their access to educational content after school was vague insofar as it does not say anything about the quality of the content desired or how this content might be used once it is accessed. Further investigative work undertaken revealed that while the research participants did not consider particulars like content quality in forming this desired outcome, they did express that they wanted this content because they thought by having more material resources with which to read or revise during the after-school hours, this might support the realization of two secondary development outcomes: improved grades and academic success. These outcomes were valued in part because of the overarching societal view in Kenya that formal education created pathways to socioeconomic advantages.

The research design attempted to build on these expressed outcomes, chiefly by introducing biNu and Worldreader as two mobile technical tools that might promote the access to educational content after school which was desired. Since it was impossible to know what might result once these tools were made available to the girls, I elected to engage in an action research process which enabled me to initiate an ongoing process of iteration, clarification, and revision of action strategies when and where it was necessary to support the achievement of the secondary development outcomes valued. In the following sub-sections, I will examine the pursuit of improved grades and increased academic success in turn.

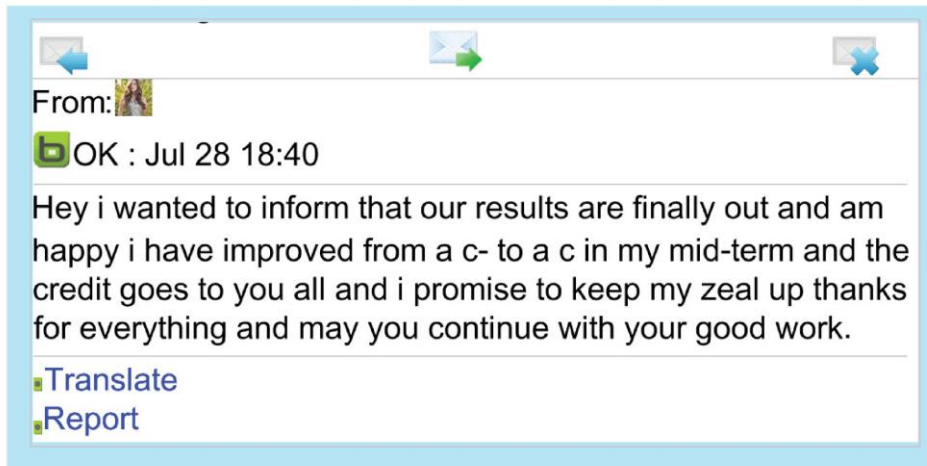
### 8.5.1 Improved Grades

Measurement of whether the research participants realized the secondary development outcome of improved grades is one which is relatively straightforward to do. What is not so clear is whether any uplift in grades could be attributed to this intervention. I will first look at what transpired with the girls' grades before assessing if any claims can be made linked to the technical tools regarding changes observed. For reference, the Kenyan secondary school grading scale can be found in **Appendix S**.

At the beginning of the study, I secured permissions from each research participant and their parents and/or guardians to review their grades for the entirety of the 2014 academic year once they became available. The most important grades in this context are the mid-term and final exam grades they earn in each of the three terms in an academic year. These exams were required for all subjects in which they were enrolled. I decided to focus mostly on the grades earned in Term 2 and beyond (beginning from early May 2014)

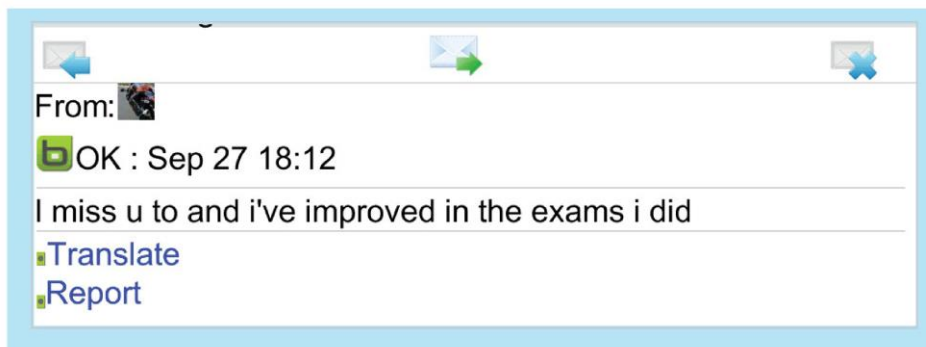
since this is when the Intervention phase would have commenced and the technical tools introduced. Comparing subject grades across the year helped gauge whether the girls realized changes they had a reason to value. I will start first by sharing some of their self-reported grade improvements before moving to the improvements documented by New Day Secondary School.

**Plate 8.11**



*Mercy reports improvement in her grade average (Author)*

**Plate 8.12**

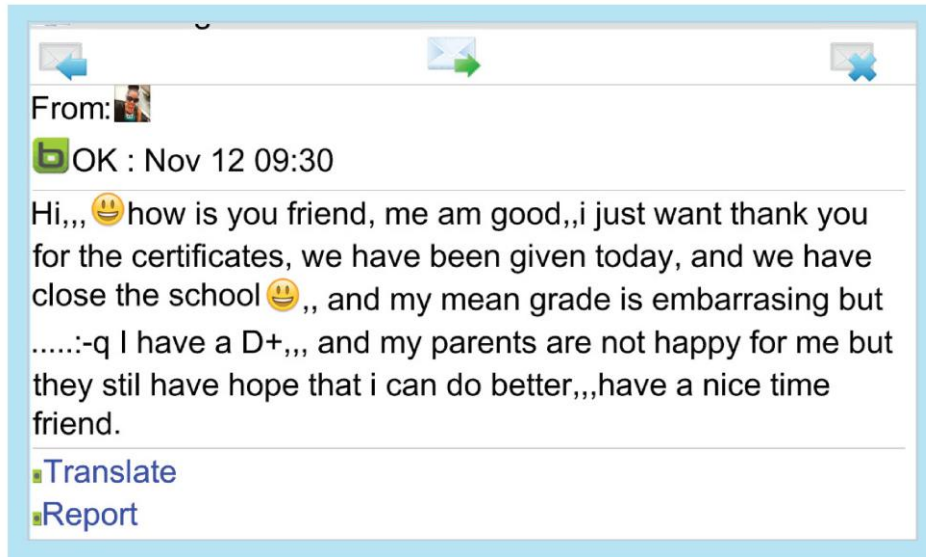


*Esther reports improvement in her second term exam performance (Author)*

Mercy's message above noted an increase of half a grade between the final exam of Term 1 and the mid-term exam of Term 2. This statement was corroborated by her exam performance scores shared by Principal Sumba. Esther reported an improved exam performance, although she did not specify the upward changes in the marks she attained. The exam results Esther referred to were June 2014 when the mid-term exams for Term 2 were taken and the final exam taken at the beginning of August. The certified mark for her advanced from a D+ to a C-. These shifts by half a letter grade were notable because during the Pre-Intervention phase and the prior academic year, exam marks for both girls had held steady.

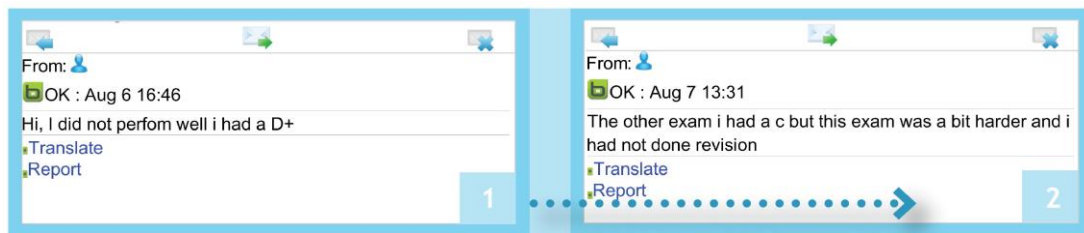
Despite the improvements documented for Mercy and Esther, there were research participants who did not improve their grades after the introduction of biNu and Worldreader (see **Plate 8.13** and **Plate 8.14**).

**Plate 8.13**



*Faith reports there was no improvement in her mean grade (Author)*

**Plate 8.14**



*Nancy shares that her exam performance suffered a drop of nearly a full letter grade (Author)*

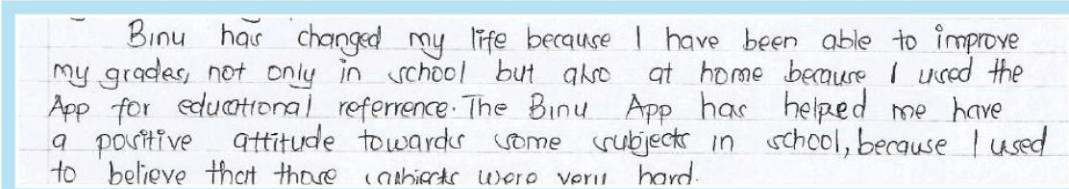
Faith noted that her marks fell by half a letter grade from C- to D+. Yet, she still appeared to be upbeat about the situation, supported by use of two smileys in her message. Additionally, she shared her parents’ reaction to the outcomes of her third set of exams. Even though Faith’s parents expressed displeasure with her performance, according to her, they appeared to still provide her with encouragement (a psychological resource) that there was room for her to improve in the future.

As discussed in sub-section 8.2.1., there is a heavy emphasis on school grades in Kenyan society. While I was unable to independently corroborate Faith’s parents’ reactions, if they were as she described, then this would have been a highly uncommon response in this context. At least six research participants had previously reported receiving punishments from their parents or guardians because they were unhappy with their daughter’s academic performance. Faith never reported a punishment and she was also one of the most avid and consistent users of the two apps despite her declining grade.

Nancy experienced one of the biggest drops between exam scores – a full letter grade – between Term 1 and Term 2. She attributed this outcome to the exam’s difficulty, probably because she had not revised. When I followed up on why she had not revised enough, she revealed that she had to trade off time revising for mathematics, a subject she improved her performance by a half letter grade to earn a C. These time-linked opportunity costs were a recurrent theme whenever I made further investigations into missed targets for grade improvements.

The research participants also made comments about their grades in the letters they wrote the creators of biNu and Worldreader (see **Plates 8.15 to 8.19**; transcripts of these letters can be found in **Appendix T**). The girls were only asked to write about what they liked and disliked about the apps, so mention of their grades was unprompted (examples of dislikes the girls shared in their letters to biNu and Worldreader can be found in **Appendix U**). Though none of the comments specified grades or subjects, I discerned what the girls were referring to by looking at their grade data:

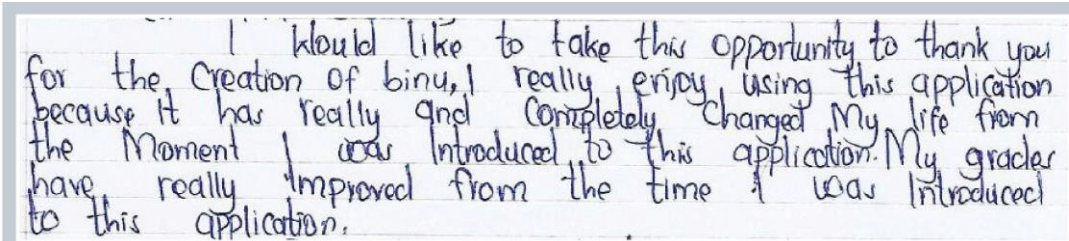
**Plate 8.15**



Binu has changed my life because I have been able to improve my grades, not only in school but also at home because I used the App for educational reference. The Binu App has helped me have a positive attitude towards some subjects in school, because I used to believe that those subjects were very hard.

*Excerpt from Ayesha's letter to biNu and Worldreader creators (Author)*

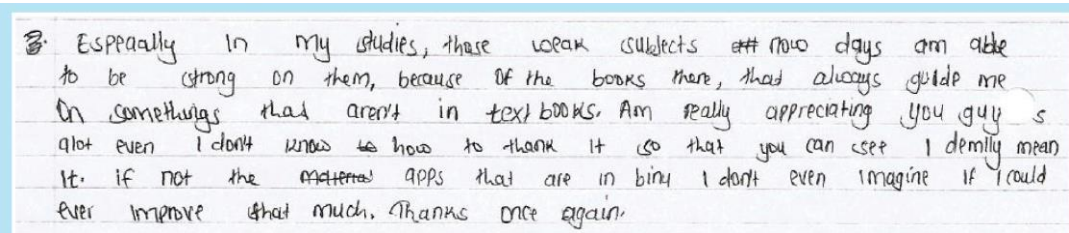
**Plate 8.16**



I would like to take this opportunity to thank you for the creation of binu, I really enjoy using this application because it has really and completely changed my life from the moment I was introduced to this application. My grades have really improved from the time I was introduced to this application.

*Excerpt from Damaris's letter to biNu and Worldreader creators (Author)*

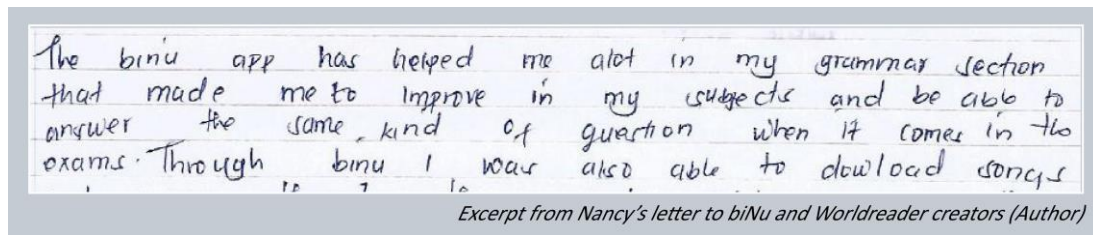
**Plate 8.17**



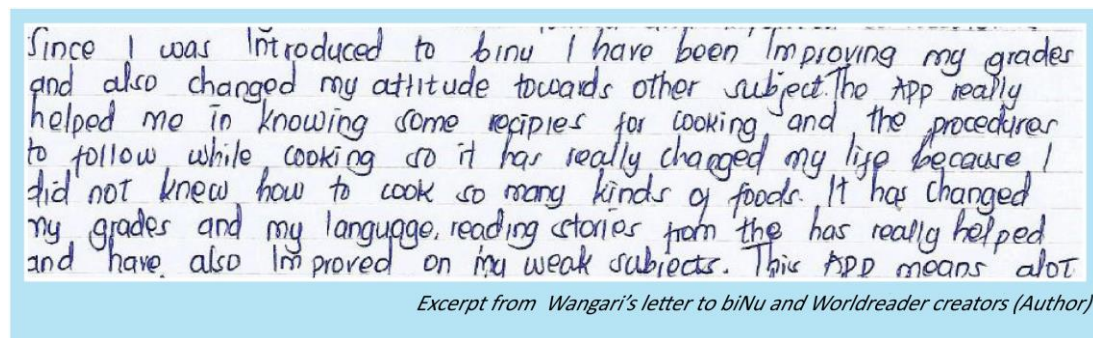
Especially in my studies, these work subjects at now days are able to be strong on them, because of the books there, that always guide me on something that aren't in text books. Am really appreciating you guys a lot even I don't know how to thank it so that you can see I really mean it. if not the ~~maths~~ apps that are in binu I don't even imagine if I could ever improve that much. Thanks once again.

*Excerpt from Lupita's letter to biNu and Worldreader creators (Author)*

### Plate 8.18



### Plate 8.19



In the letters from Ayesha, Damaris, Lupita, Nancy, and Wangari, we see similarity in the remarks made in which they attribute their grade improvements to their appropriation of biNu and Worldreader (as an app within biNu). Lupita shared that she found that using the textbooks in Worldreader helped to improve her grades. Nancy stated that exam questions from beSmart (an app within biNu) helped her prepare for exams at NDSS since the questions were similar in what was asked. Perhaps even more noteworthy is that both Ayesha and Wangari attribute not only grade improvements to Worldreader, but also positive shifts in their attitudes (psychological resources) towards subjects they previously disliked or had performed poorly.

Looking at their grades in teachers' grade books, Ayesha, Damaris, and Wangari made grade improvements of at least half a letter grade in each subject that year. Lupita and Nancy had more modest performances: Lupita only improved her grade in Home Science (a full letter grade), dropped in Biology (half a letter grade), and had no change in all other subjects. Nancy improved her grades in English (half letter grade), Religious Studies (full letter grade), and had no change in all other subjects.

When I compared the 22 research participants' overall exam score averages earned at the end of the 2014 academic year with those from 2013, nine girls (nearly half of all research participants) earned lower marks or experienced no improvement in their overall average. The improvements for the other 13 girls were usually a half-letter grade. Returning to the second objective for this sub-section, I will now discuss whether the changes realized can be linked to the intervention with any degree of certainty.



Through my introduction of biNu and Worldreader with the aim to help 22 girls at NDSS increase their access to educational content after school, the research participants probably believed to a certain extent that the apps might help them realize more choice, at a minimum. This is because the apps were introduced by someone who was completing PhD research, and in Kenya someone studying at the doctorate level is assumed to have a high degree of expertise in the area that they are conducting research in. My status as a foreign person with government approval to conduct research may have also sent the message that I was likely providing technical tools that would be guaranteed to work to the girls' specified benefit. It would have been hard to lower this expectation even when I made clear that it was not guaranteed the intervention would help them realize their desired development outcomes.

Moreover, because the intervention was technology-based, its novelty, even with the taboo-breaking after-school use of mobile as an item forbidden to be on school campuses, might have contributed to the belief among the girls that the technology would automatically make helpful contributions to their academic progress (Draper, 2000). As another possibility, the circumstances of the intervention suggest that a placebo effect could have been at play: Knowing that they were being observed and provided with ongoing support (Adair, Sharpe, & Huynh, 1989) could have caused the girls to exhibit behaviors that would benefit the realization of their targeted secondary development outcomes. This could be amplified if I was someone the girls might look up to or otherwise respect, and I showed that I cared about their academic performance – and actively work towards helping them lead lives they have a reason to value. Attention from a foreigner could have heightened the girls' feelings of being exceptional, especially when the ritual of being called for research activities after school each week is considered. All of this could have influenced the frequency with which the girls used the mobile tools, their attitudes towards them, and the level of commitment demonstrated to completing the research activities. The effect could have also been to encourage the girls to focus more when they studied, or to spend more of their free time studying, learning, or indeed mobile reading so that they could improve their grades.

Because of this, the grade improvements seen, while heartening, do not precisely pinpoint the technical tools as the source for this change. Especially since the intervention was not a success from the perspective of grades improvement for three of the 16 girls who managed to sustain their digital participation throughout the study, the fact that the intervention may have worked in this way for some but not all of this group highlights that the technical tools were not silver bullet solutions.

### 8.5.2 Having Academic Success

Regarding the other secondary development outcome the girls wished to achieve, to have academic success, the findings are also not fully clear: Given that Kenyan society makes a clear link between good grades and the notion of academic success, without a clear positive effect on grades it is impossible to claim that the intervention lead to academic success. Additionally, while it is possible to objectively measure grade changes within an academic year, notions of academic success are extremely subjective, can vary from one girl to another, and are best studied longitudinally, beyond just one academic year<sup>34</sup>.

All of this is not to discount the possibility that the intervention might have helped the girls improve their grades. Rather, the intention is to recognize the manifold limitations in terms of the conclusions that can be drawn from the data, even with the triangulation efforts I undertook. We should also be reminded that there were multiple influential structural and resource-based agency factors which contributed to the outcomes the girls achieved or were unable to realize, including the time available after school, the control they had over this time, their experiences of mobility, both physical and virtual, and their ages and gender as personal characteristics that would have been subject to discourses and norms which framed the context of action.

### 8.6. Conclusion

Despite the use of triangulation, I found that the impact of this ICT4E intervention was not straightforward to discern. The girls' opportunities for realizing their desired secondary development outcomes were in myriad ways shaped by factors which alternately created, expanded, and/or constrained their individual agency. Because of this, the girls' attempts to realize their goals were inherently complex acts that affected what they were actually able to achieve by the end of the study period.

Through the analysis, I surfaced insight into how two different types of mobility came to bear on the 22 girls as they sought to realize secondary development outcomes of improved grades and academic success through their study participation. Here, the link made between girls' formal schooling and experiences of physical mobility on the journey home from school illustrated that how, where, and for how long a girl walks after school can signify a great deal about the amount of freedom she has once at home – particularly if she must engage in activities not of her own choosing during this journey. Leanta's journey home once more gave evidence of the ongoing challenges presented by the gendered division of labor in households in this context. She had to complete errands on her way home which lengthened her journey and made it more unsafe even though her older

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<sup>34</sup> For a longer discussion of different notions of and factors for academic success in the Kenyan context, see Buchmann, 2002.

brother was free of this responsibility and had the time available so could have completed these errands for the family instead. Conversely, the concept of exhibiting autonomy at the margins was evoked as we unpacked journeys that Gloria and Zeituni took in which they transformed the mundane into adventures where they could enjoy freedom along the in-between spaces they traversed. In Zeituni's case, this meant she sometimes engaged in mobile reading while riding home on a *matatu*.

The emergence of virtual mobility practices was a catalyst to explore how and why mobile reading activities were enacted in a context where research participants were frequently subjected to marginalization because of their age and gender. We saw that the structural and resource-based agency barriers that were first identified in Chapter 6, including the lack of financial resources to pay school fees, were a major contributor to the girls' inability to sustain in-person school attendance. When disruptions occurred, some research participants combined other components of their resource portfolios to pursue a workaround solution to their school exclusion. By responding to the challenge of interrupted school attendance with mobile reading activities to attempt to keep pace with what had been taught at New Day Secondary School, some of the girls exhibited innovation, resilience, and indeed persistence to combat their exclusion by taking advantage of imaginative virtual travel through which different m-books could be explored. While these actions were not meant to replace formal education participation, they do suggest that the mobile medium could have promoted a sense of inclusion in unexpected ways.

By the end of the study, the unevenness with which the positive outcomes were spread among the research participants indicated that the intervention's accomplishments with respect to improving the girls' grades and helping them attain academic success were inconclusive. While some girls' grades improved and others gained unintended benefits such as more positive attitudes towards their formal learning, many were still unable to use the technical tools introduced in a manner which enhanced their freedom. The inequality in the experiences of the 22 research participants placed a spotlight on the challenges involved with designing an ICT4D intervention that does not potentially contribute to further marginalization of people in a population you may wish to help. All of this points to the argument repeated throughout this thesis that structural change must be partnered with resource-based agency enhancements if more definitive and sustainable transformations that research participants have a reason to value are to be achieved.

In the final chapter, I will revisit the major findings of this study before discussing the contributions made through this work, and conclude by outlining areas for future research.

## Chapter 9: Conclusion

*Now I want to use it [her mobile phone] to learn more.* Everlyne

This thesis examined an action research process with a group of 22 secondary school girls in Nairobi who sought to increase their access to educational content after school. Two mobile apps, biNu and Worldreader, were introduced during the 13-month period the study occurred. The apps had the potential to facilitate access to more than 6,000 books and other educational content and media. The analysis of qualitative and quantitative data collection accrued through a mixed methods approach enabled a holistic picture of the phenomena under study to be built. Actual app usage statistics bolstered by qualitative data collected over more than a year including after-school participant observations, mobile ethnographies, focus group discussions, and semi-structured interviews revealed the complexities inherent in processes of human development, especially with a vulnerable population that has historically been subject to marginalization.

By the end of the study, it was seen that a variety of structural elements had a significant influence on the girls' ability to achieve this increased access, including discourses, policies, school as an institution, and norms around the use of ICTs in education, particularly mobile learning. Personal characteristics, such as age and gender, also shaped the girls' access to ICTs, their time available after school, and how and where they were permitted to travel during the same period. The sum of these challenges meant that increasing access to educational content after school was realized unevenly among the research participants. The challenges also demonstrated that merely providing an additional material resource is insufficient to achieve educational empowerment after school if the context in which this resource is used remains unchanged.

Throughout the study, insight was provided into a time and spaces where girls' education literature in the Global South infrequently ventures: after school. In particular, utilizing the Choice Framework (Kleine, 2013), I analyzed the context before and after an intervention, and undertook a process of action research after school with hopes of, together with them, bringing about change that girls enrolled at New Day Secondary School in Nairobi valued. The practice of AR here was informed by the capability approach (Sen, 1999), which advocates for human development in a manner which advances human flourishing. Through application of the CA, the aim was to facilitate a girl child-centered intervention to expand freedom by enhancing the research participants' capabilities after school, particularly their resource-based agency.

By definition, increased choice is the primary outcome of human development. Secondly, what the girls valued was improved grades and academic success. To achieve

what they wanted, they desired a choice to increase their access to educational content after school. Mobile phones and two applications were the proposed technical tools I identified to support pursuit of these development outcomes. Despite triangulating self-reported data on improved grades and academic success with comparisons of the grades the girls earned during the 2014 academic year and years past, the study length was not sufficient for substantiating with a high degree of certainty the girls' realization of the longer-term development outcomes. Nevertheless, systematic observations suggest that increasing choice to access educational content after school resulted in the emergence of previously unspoken doings and beings which may more accurately reflect the full composition of the lives the girls had a reason to value – instead of what they may have thought was expected of them to value (Unterhalter, 2003a). Everlyne's quote above speaks to this shift because she was referring not only to using her mobile phone more for formal learning, but also for non-formal and informal learning activities.

The experiences analyzed in this study underscored the argument that merely increasing the resources an individual has will not guarantee that she can realize the valued doings and beings she desires (Frediani et al., 2014; Kleine, 2013). There is often a need to transform structures as well, especially where poverty and inequality are rife. The findings surfaced in this study confirmed that because human development is pervaded by socioeconomic and political forces which can sometimes constrain rather than enhance freedom when people appropriate mobile technology, a holistic approach is needed when evaluating ICT4D capabilities-based interventions in order to identify and engage thoughtfully with these forces and constraints (Alampay, 2006a, 2006b; Gigler, 2015; Kleine, 2011b). This has also been found in other ICT4E interventions (Hatakka et al., 2013; Hatakka & Lagsten, 2012). Moreover, I was able to bolster the supposition that education-related discussions, especially when personal characteristics like age and gender are taken into consideration, cannot be undertaken in a homogenous manner (Unterhalter, 2003b).

The remaining sections of this chapter will be presented in four parts: First, I will summarize the main thesis findings and discuss their implications. Next, I will review the answers to the subsidiary research questions which contributed to the identification of the overall findings shared. Then, I will examine the contributions this thesis has made theoretically, methodologically, and empirically, especially with respect to the triangulation of qualitative findings with quantitative, actual mobile app usage statistics. Subsequently, I will share suggested areas for further research before concluding with an outlook on the opportunities and challenges for girlhood in the digital age, and during the after-school hours in developing contexts.

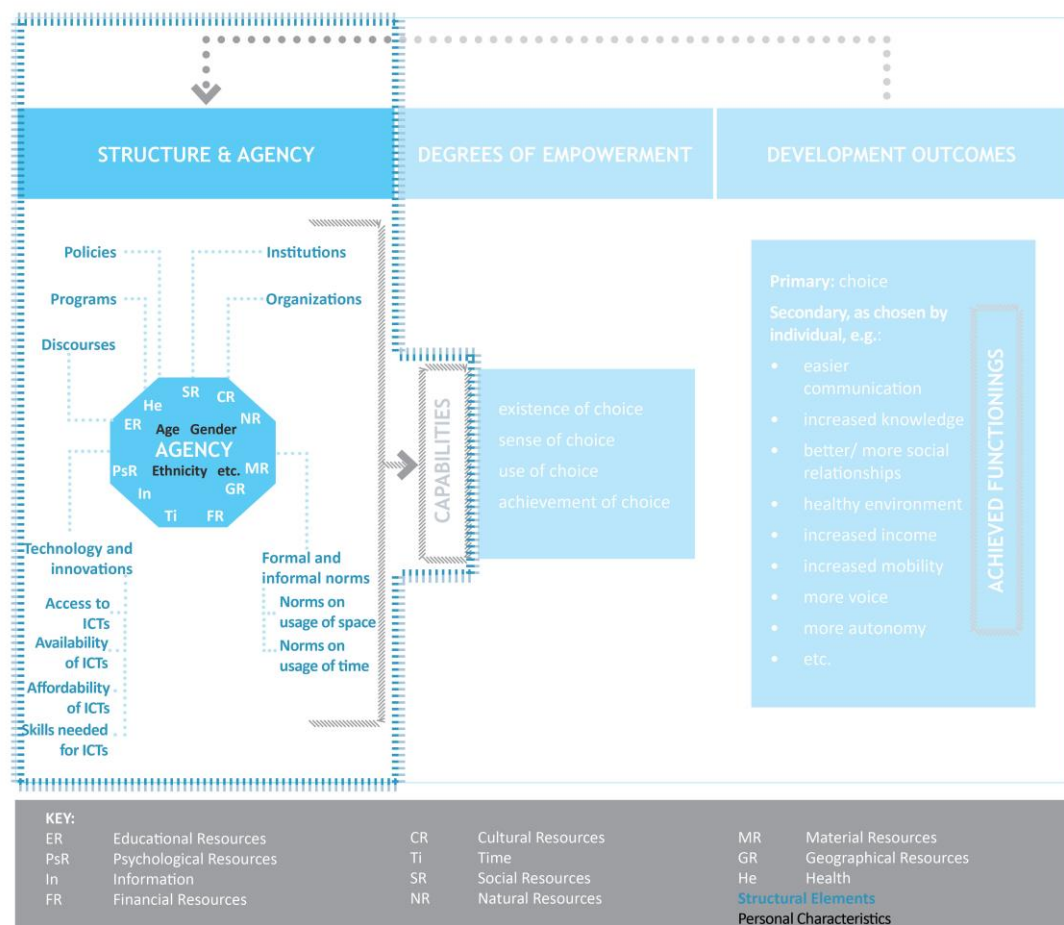
## 9.1. Mobilizing Girls' Capacity to Choose After School?

The central research question I devised based on a finding from the exploratory study (see **Section 5.4**) was: *How, if at all, might the introduction of mobile apps impact the girls' desired development outcome of having choice to increase their access to educational content after school?* Once the AR process commenced, I mapped the research context, designed the study, and then evaluated the 13-month intervention using the CF as a tool to operationalize the capability approach. What follows is an overview of the research findings that as an aggregate formed the response to the central research question in this thesis.

### 9.1.1 Structure and Agency: The Significance of the Capabilities Framing

At the heart of the CA is the goal to increase the possibility that people can engage in valued activities and states of being by enhancing their capability to realize these activities and states (Sen, 2003). To do this, a person's capabilities, constituted of their resource-based agency and the structures that they navigate as they exercise their agency (Kleine, 2007) (see **Figure 9.1**), must be developed so that their individual freedom is expanded.

**Figure 9.1**



*Reimagined Choice Framework, structure and agency highlighted. Developed by the Author based on Kleine (2013)*

Age and gender were two personal characteristics encompassed within the resource-based agency of the 22 research participants, and had a strong effect on the events in this study. The structure that the girls at New Day Secondary School lived in was in many ways formed in direct response to both their gender *and* ages: For examples, norms associated with their mobile use, and where, how, and for what purpose they were permitted to travel were instituted because they were girls and because of how old they were. This relationship is particularly noteworthy given that the structure a girl child lives in is almost always reflective of their parents' or guardians' own capabilities (Biggeri & Santi, 2012). Accordingly, freedom constraints their (older) parents or guardians experience, derived from their resource-based agency and structural elements, are often passed on to their children. When the CA is examined in the context of children and education, the freedom children have to choose *now* is linked to their ability to realize valued activities and states in the *future* (Saito, 2003).

Yet, there is recognition that education is not a means to an end on its own because "...not all individuals will participate or benefit from education in the same way, nor be able to convert the resources afforded by education to generate the same or similar advantages in life," (Hart, 2012, p. 276). Accordingly, in Chapter 6 we saw that structural elements which framed the lives of 22 secondary school girls in Nairobi impacted their resource-based agency in such a way that some participants were in a better starting position than others to pursue their desired development outcomes via appropriation of biNu and Worldreader on their mobile phones after school.

Beginning in December 2013 and drawing on nearly two years of engagement with the research context, I used the Choice Framework to identify various structural elements and resource-based agency components that might affect the study outcomes. This was continued throughout the AR process as new barriers and enablers came to the fore. I found that structure quite often was a significant determinant of whether a girl would be able to realize the primary development outcome of choice, namely having the option to increase her access to educational content after school with the two mobile apps introduced. The structural elements that played the most influential role included the policy banning mobile phones in Kenyan schools, NDSS as a powerful institution, discourses about girls and mobile phones, gendered informal norms on the usage of space and time, and access to technologies and innovations, specifically their access to their mobile phone.

The combination of the Government of Kenya's education policy towards mobile phones and school as an institution influenced how the girls and their families viewed mobiles and its potential to support learning. Mobile phones were banned from being carried to school by the girls, which sometimes made our after-school use of these devices

contentious when we were at NDSS. Although teachers regularly used their phones at NDSS – and in some cases appropriated them after school to learn themselves – a “do as we say, not as we do” practice was enacted by some teachers. This exposed part of the structural elements that constrained activities with mobile phones and which were linked to age as a personal characteristic of each research participant.

Discourses and norms about mobile phones embedded in the research setting also shaped the study because they determined for whom it was appropriate to access mobile phones, and when, for how long, and for what purpose they could be used: The attitudes and perceptions that parents had towards their daughters’ phone appropriation were often – but not always – negative. This gave rise to stereotypical discourses which characterized young girls’ interactions with the technology as potentially harmful, distracting and/or frivolous. The informal norms on the usage of space and time that were then created around phone use for people under 18 in this study meant that access to mobile phones, particularly their availability after school, was curtailed.

The girls’ schedules on school days effectively provided most girls with time amounting to two hours or less which they might control independently. Even still, it was often the parents’ or guardians’ expectations that this time would be spent doing something they deemed productive. So, informal norms also pervaded what could have been free time to engage in activities of the girls’ choosing. Furthermore, despite there being multiple places after school where a girl might use her phone to access educational content, norms on the usage of space frequently confined her to her home for this activity. The sum of these structural constraints placed many limitations on their mobile phone access – so much so that girls even created rules for themselves which restricted their phone use beyond what their parents or guardians required. The girls sometimes justified this by repeating the age- and gender-related discourses associated with after-school mobile use, reinforcing actions which inevitably limited their opportunities to IATECAS once the intervention commenced. Accordingly, some girls undoubtedly had home environments which made the pursuit of their desired development outcomes more challenging when compared to their peers.

With respect to resource-based agency, this investigation surfaced a view shared by several research participants: Time was the resource which affected their education most, particularly after school. Even structural elements were often affected by time in its myriad manifestations (e.g. age, life stage, clock time, etc.). We also saw that other resources considered in the context of education took on new meanings when viewed in relation to the resource of time – or the lack thereof. For example, the girls’ access to educational content after school was shaped by the time available to them. With less self-



directed time, their freedoms to engage in activities they valued was effectively reduced, even if these activities might advance the achievement of development outcomes their parents and guardians valued. Autonomous time in the girls' home environments was in short supply not only because of structural influences but also because of mobility.

Mobility was a combination of time, geographical resources, and health at a minimum in this context. Physical mobility was considered in the girls' journeys between home and school, and their execution of domestic tasks inside and outside the home. These movements were often temporally elongated because of expectations that the girls would perform domestic labor tasks en route to their homes. The journey from school was also made longer by a lack of financial resources to pay for faster forms of transport. The opportunity to be virtually mobile, by adding (at a minimum) their mobile phone as a material resource and mobile network coverage as a geographical resource to the mobility resource combination, was similarly affected by the gendered division of labor (i.e. having enough time to be virtually mobile) and financial resources to purchase mobile phone credit. This all resulted in less time after school for other activities the girls might value, thereby highlighting the complex interrelationships between time, mobility, and after-school educational impacts for the learners.

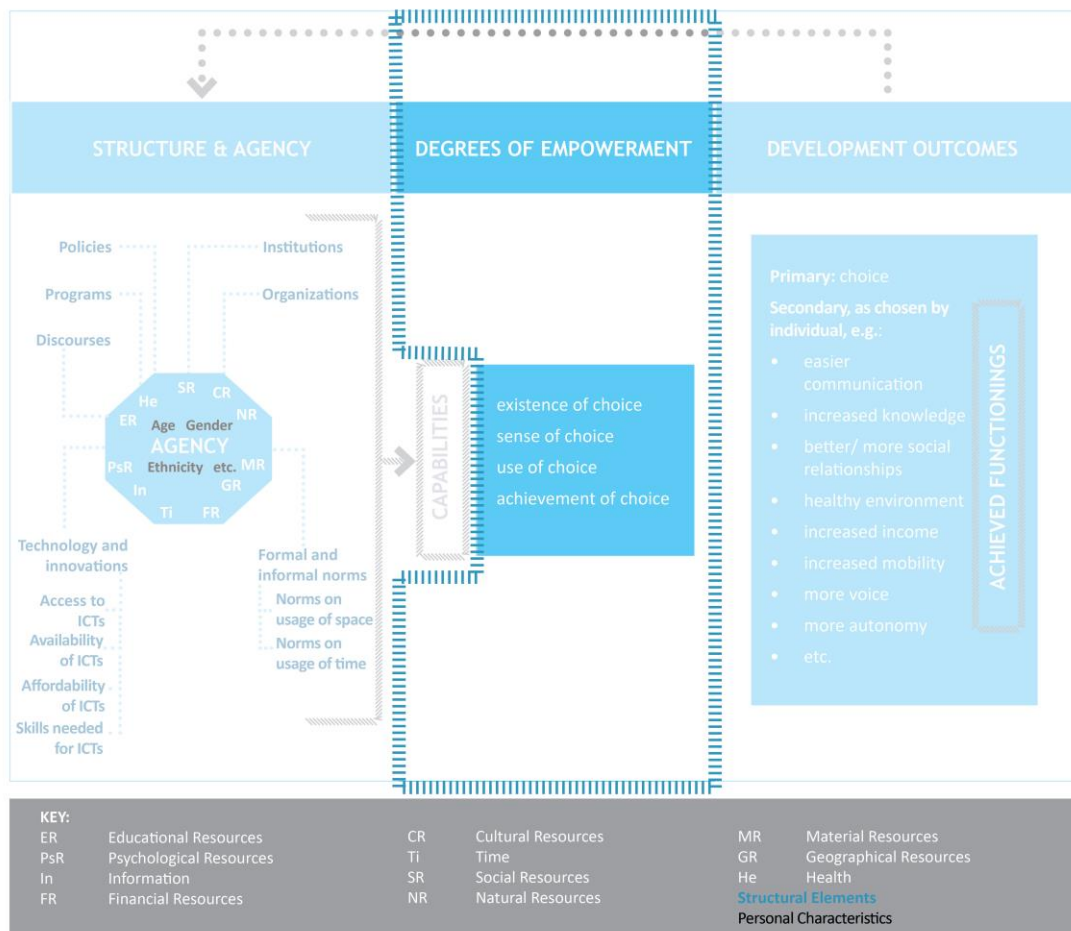
While material resources (a mobile handset and two mobile apps) were added to the girls' resource portfolios during the study, there was not much additional time provided or created through mobile appropriation. Particularly in the absence of sufficient additional time, it was not always possible for the girls to realize the choice available to the girls to IATECAS. Furthermore, if physical or virtual mobility was not transformed during the study, then the likelihood was low that an individual girl could use these resource combinations to achieve the development outcomes she sought. Time as a resource and mobility were negatively impacted when the participants' ages and gender (personal characteristics) were brought to the fore. This was because, given their contexts, a plethora of structural elements derived from these personal characteristics bore down on the girls so strongly that some of them were unable to surmount the constraints they faced given the resources available to them. The mutual influence between structure and agency here set the scene for understanding the reasons behind the next area of the Choice Framework to be examined: the four degrees of empowerment.

### 9.1.2 The Existence, Sense, Use, and Achievement of Choice

In Chapter 7, we moved to examine how the structural elements and resource-based agency components identified in Chapter 6 influenced choice during the study. Here, we investigated the degrees of empowerment the research participants may have experienced

during the intervention, expressed in the language of the CF as the existence, sense, use, and achievement of choice (see **Figure 9.2**).

**Figure 9.2**



*Reimagined Choice Framework, degrees of empowerment highlighted. Developed by the Author based on Kleine (2013)*

The existence of choice for the girls to IATECAS was established when biNu and Worldreader were introduced. However, the notion that choice to IATECAS was possible had initially been constrained with mobile *and* the other available material resources in their lives due to the influence of the structural elements and resource-based agency components highlighted in the previous sub-section. Yet, for all 22 research participants, this choice existed by April 2014 when the Intervention phase was launched and I shared how these technical tools could help them to IATECAS.

The sense of choice was predicated on at least three factors: confidence to use the two apps (psychological resources), skills to use the apps to their advantage (educational resources), and their parents' and guardians' opinions about their mobile appropriation (discourses). Activating the sense of choice among the research participants was a gradual change supported by action strategies which emerged during the ongoing clarification process as I sought to facilitate choice to IATECAS. One example of an action to stimulate the sense of choice were workshops held during the first term break to help the girls

develop their skills and confidence so that they might be able to use biNu and Worldreader independently. I noted that parents' and guardians' negative opinions about youth mobile use presented another strong barrier to the sense of choice because a few girls uncritically expressed similar opinions. Adult stakeholders' attitudes towards youth mobile use became a hindrance to the girls' ability to believe that using their mobile phone to access biNu and Worldreader was a choice available to them, and at their age. Nonetheless, with the passing of time, all 22 research participants came to experience a sense of choice, too.

The use of choice is where significant differences were demonstrated in terms of the empowerment learners experienced. Four case studies of individual learners illustrated how a variety of structural elements intersected with time to accord (dis)advantages among the learners in terms of if, how, and when they could appropriate the proposed technical tools. Here, we began to note with further precision the fact that age as a personal characteristic had multiple impacts on the learners' pursuit of the primary development outcome of choice to IATECAS. Girlhood in this context meant that while choice could exist, and a person's sense of choice could be developed, the confluence of age, gender, and the related behavioral norms adult stakeholders had of the girls all could limit or altogether prevent the use of choice. Six research participants were unable to sustain their use of choice beyond the first two months of the study, most of whom recounted gendered and age-related norms such as an unequal division of household labor that were insurmountable barriers.

The achievement of choice was measured by assessing the amount and type of educational content the girls had access to pre- and post-intervention. Given definitions of the achievement of choice by Kleine (2007; 2012) and Alsop and Heinsohn (2005), an increase in these assessment areas would mean that the girls had experienced the achievement of choice to IATECAS. Achievement of choice would also link to the realization of the development outcome to have the choice to IATECAS. Analysis of the available quantitative data, the girls' mobile app usage statistics, showed that there was a substantial increase in the amount and type of educational content they gained access to when compared to what was available after school before the intervention commenced. Not only did they read books related to their academic work, such as science textbooks and historical accounts, they also read recipes and practiced cooking, and sought out inspirational books and quotes to motivate and encourage them. Based on the pre-intervention assessment of the girls' circumstances via participant observation and surveys, the choice to increase access to a larger amount and variety of educational content was achieved. By the end of the study, there were 16 girls who experienced this achievement of choice to IATECAS through their sustained use of biNu and Worldreader.

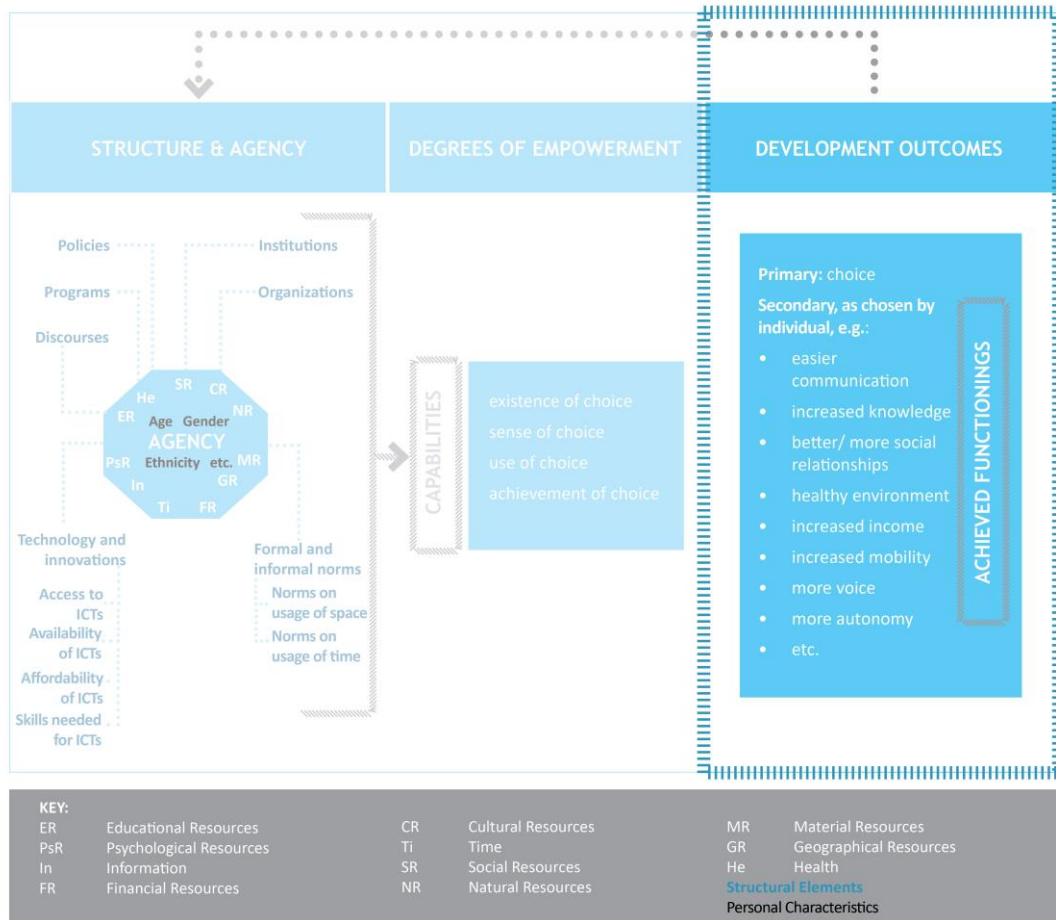
With achievement of choice attained, deeper analysis provided additional insight about the development outcomes: Although the girls had initially expressed that they valued the ability to IATECAS because of the further development outcomes they desired (improved grades and more academic success), these outcomes were linked mostly to their formal learning experiences – and were likely voiced due to the perceived social desirability of doing so. However, the data surfaced other valued doings and beings that the girls held, including to be informed about topics such as how men and boys should put on condoms, playing games, and using their imaginations as they read inspirational and fiction books.

I will now turn attention to exploring if the girls realized the secondary development outcomes of improved grades and increased academic success.

### 9.1.3 Realizing the Secondary Development Outcomes?

When the girls' desired development outcome for increased access to educational content after school was probed further during the exploratory study and Pre-Intervention phase, we saw that realizing the development outcome of choice to IATECAS was desired for two secondary development outcomes (see **Figure 9.3**): improved grades and more academic success.

Figure 9.3



*Reimagined Choice Framework, development outcomes highlighted. Developed by the Author based on Kleine (2013)*

Evidence from the literature on the Kenyan education system and how education is viewed by society suggested that these outcomes could have been decided on due to their social desirability, or that the girls thought it was what was expected of them. Still, they found these outcomes to be valuable because of the potential future outcomes that educational success might enable when they are older. These development outcomes were longer-term doings and beings to be realized over a time that was less immediate than the realization of choice to IATECAS. These functionings also required a broader combination of resource-based agency components – and would still be subject to challenges from the same structural elements discussed in Chapter 6.

The girls believed that improved grades could be made possible by having choice to IATECAS because in diversifying the type of content available, an opportunity to add to their knowledge was presented. This was especially true if the content was in subjects they studied as part of their formal education. As a related secondary development outcome of having improved grades, the girls also sought the academic success that comes with accruing multiple good class grades and exam scores. By attaining academic success built in part on increased access to educational content and improved grades, the desired

development outcome was to have a better future, one where they might complete a university-level education.

Through data analysis, it emerged that among the 22 research participants, the above-named development outcomes of improved grades and increased academic success were realized unevenly. Within the context of this study and the secondary development outcomes sought, we saw that mobility and time were further evidenced to be two powerful factors that shaped the girls' ability to lead lives they have a reason to value. Through a collection of case studies drawn from after-school participant observations conducted with two girls, and another built through self-reporting and data triangulation, connections were observed between the nature of the journey home from school (physical mobility) and the amount of freedom the research participants had to exercise control over their time, including to initiate virtual mobility if they chose to with their mobile phones.

When the girls engaged in virtual mobility, evidence from the data collected on how they used biNu and Worldreader demonstrated that their imagined virtual travels initially traversed academic content, but increasingly as the academic year progressed, they also explored content unrelated to their formal schooling. The implication was that the girls' after-school time use to IATECAS eventually led to them according more focus on content that was non-formal and/or informal learning in nature. This denoted that sustained use of the technical tools was made possible and bolstered when the girls drew on intrinsic motivations and the valued doings and beings they held but had not expressed previously. Because their time was limited after school due to their arrival time at home and the various gendered discourses and norms (including on the division of labor and access to mobile phones) that pervaded these spaces, even when 16 of the research participants exercised the choice to IATECAS, there was, in their opinion never enough time for it.

Although 13 of the 16 girls saw grade improvements by the study's conclusion, these improvements were not seen in every subject or for every girl. Additionally, to establish with more certainty that academic success was eventually realized, while a study across 13 months is a long time, it remained an insufficient length for this purpose. Moreover, the study design did not include mechanisms to target the realization of academic success beyond self-reported qualitative data the girls shared themselves during this period. In the absence of more longitudinal data beyond the 13 months, and data that could be triangulated, any claims to academic success would only be tentative.

Taken as an aggregate, these findings further substantiate the argument that a development intervention which is implemented to bring about lasting change in the lives of the participants can be effective insofar as the solution introduced contributes to both resource-based *and* structural change (Kleine & Unwin, 2009; Zheng & Walsham, 2008). If

the resources available are expanded and the structure in which the intervention is carried out remains unaltered, then the likelihood of realizing the targeted development outcomes is diminished. This is perhaps even more true for those people who may already experience inequalities more intensely as a result of the structure within which they live and the resources they are able to activate in this structure (Oosterlaken, 2013; Tacchi, 2012).

Having presented a brief synthesis of the main research findings, I will now review the findings surfaced through answering the subsidiary research questions. This will be done to provide an evidence base from which to support how the overall response to the central research question was established.

## 9.2. Answers to Subsidiary Research Questions

To accompany the main research question of “How, if at all, might the introduction of mobile tools impact the girls’ desired primary development outcome of having choice to increase their access to educational content after school,” I asked six additional SRQs to generate further detail in the analysis of the findings. These questions were iteratively reflected upon across the three AR phases.

### 9.2.1. Subsidiary Research Question 1

*Do the girls view the mobile phone as a tool to facilitate IATECAS?*

By posing SRQ1, I sought to explore the girls' initial views on mobile use as an after-school learning tool with the aim to assess how this perception might affect eventual usage of the proposed apps. In the use of ICTs for development we have often seen that when technology is introduced, particularly in the education sector and in places where their appearance may be exceptional, there is a tendency to view technology as a silver bullet that can resolve people’s problems (Hollow, 2010; Unwin, 2009). At the start of the study and as explored in Chapter 7, I found that this sentiment was not the case among the 22 research participants I worked with.

With few exceptions, most girls initially expressed the opinion that they did not believe that mobile was a useful learning tool. However, as the study progressed, educational appropriation of mobile phones among this group of girls became increasingly common for formal, non-formal, and informal learning activities. In parallel, the sense of choice among the girls to use the two apps towards achieving their desired development outcomes was cultivated. A tool which was previously viewed primarily for its utility in facilitating social interactions (Sey & Ortoleva, 2014), or for the realization of other practical interests such as receiving mobile money transfers (Gajjala & Tetteh, 2014), was transformed into a tool that could support an area of the learners’ lives where prior use of

this nature was infrequent or applied in a manner which was not very sophisticated (Porter et al., 2016; Zelezny-Green, 2014).

If the girls' parents or guardians observed or inquired about their use of the two apps, and came to see the utility of the apps for their daughters, this further benefited the participants' own perspectives on mobile as a learning tool – and in terms of gaining permission from their parents to use it more frequently for this purpose. My dual roles researcher and a guide to using the two apps, particularly for developing the girls' confidence and skills in appropriating them, and the permission and encouragement of their parents to use the tools to achieve IATECAS, were positive contributors to the shift in how mobile was perceived. This finding underscored the importance of the roles that parents and guardians play in girls' secondary education, not only in terms of being facilitators of their daughters' potential freedoms through the norms they use to shape their behavior (e.g. permissions to appropriate mobiles), but also through providing psychological resources such as encouragement for their educational endeavors (Warrington, 2013). Moreover, this strengthens the rationale for carrying out a holistic evaluation so that people-led underlying causes for any documented changes are more likely to be captured (King, Dawson, Batmaz, & Rothberg, 2014).

### 9.2.2. Subsidiary Research Question 2

*How, if at all, do norms on the use of time affect the girls' mobile use to IATECAS?*

Time emerged as the most influential factor affecting the girls' education. As such, this resource was examined throughout this thesis. Having time to study was viewed in this context as invaluable to improving grades and achieving academic success. However, there existed disparities between what adult stakeholders might have expected the girls to achieve and what they actually empowered the girls to achieve. This discrepancy was most often seen in the parents' and guardians' creation of gendered norms around the division of household labor after school, and the time that was then made available to the girls to study or otherwise engage in activities they valued. The inequalities observed were decidedly age- and gender-based in terms of the balance of power and control over the girls' time.

While the gendered division of labor and the accompanying implications for time poverty has been studied extensively from the perspective of women in the Global South (Burchardt, 2008, 2010; Charmes, 2006; Kes & Swaminathan, 2006; Merz & Rathjen, 2009; Roberts, 2016; J. Walker et al., 2014), these examinations rarely place schoolgirls at the center of the study, often implying girls are women's counterparts to which the same challenges be indiscriminately applied (see for exceptions (Abuya et al., 2013; Lloyd et al., 2008; Ritchie et al., 2004).



Literature which has surveyed girls' education and the factors which contribute to differential development outcomes realization often mention time as a barrier (F. Chege & Sifuna, 2006b; Unterhalter et al., 2014). This thesis adds evidence to this point, and offers examinations of why time is a challenge for girls' education during the after-school hours in particular. Through this work, I investigated different manifestations of time that are influential (e.g. age, (inter)generational, etc.), and built a picture of the after-school hours for secondary school girls in Nairobi enrolled in formal education. Further discussion about how girls might be empowered to control more of their time when they are enrolled in school so that they can lead lives they have a reason to value remains a pressing concern.

Direct observation of the research participants during after-school hours was crucial to fostering a well-rounded understanding of girlhood in this context. Although I had previously spent entire school days at NDSS, including during the extended after-school hours, longitudinal research conducted with the girls once they left school grounds had heretofore been conducted on just a few occasions during my Master's level research. Sharing the embodied experiences of walking home from school, participating in chores, eating dinner with their families, and engaging in the cleaning process before they were permitted free time helped me identify and recognize their challenges and enablers more intimately.

These circumstances helped me understand that while the technical tools I proposed had great potential to support the girls' abilities to achieve their desired development outcomes, this potential was still inextricably linked to the time participants had available to them. Time was frequently diminished because of their age and the corresponding expectations placed on the girls by other people in their household – and even their teachers at school. With no extra time available, and the same amount of domestic and school work that they were responsible for before and after the introduction of the tools, app usage had to be squeezed into an already packed schedule. The data collected strongly suggests that those girls who had more time benefited more from the two apps with respect to achieving their goals, and those who had less time experienced no discernible difference.

Nonetheless, as the girls became increasingly aware of the significance of how and by whom their after-school hours were structured, there were a few spontaneous discussions where they questioned and/or made complaints about this perceived injustice and its sources. While acknowledging injustice could be seen as being less helpful when compared to taking concrete action towards dismantling the structures that are the source of this injustice, Sen (2009) argues that reasoning about and identifying injustice contributes to its understanding. In understanding and naming injustice, Sen (ibid.) also

proposes that people are taking the first steps to preventing the injustice from happening again. When viewed in this way, the dialogic exchanges about the girls' lack of time were transformed to be a more active way of engaging with the choices available, or lack thereof, and why circumstances were as they were.

### 9.2.3. Subsidiary Research Question 3

*How, if at all, do norms on the use of space affect the girls' mobile use to IATECAS?*

Here, mobility came to illustrate how physical movement across and through spaces was influenced by local norms. These norms, often gendered, came with implications for the girls' time and their control over it after school. Virtual movement through the two mobile apps while the learners remained in one place, usually their homes, also came with its own set of regulations, and was occasionally linked with time, too.

In traveling home with six of the research participants after school, each route taken traversed different spaces. However, travel to and through these spaces was made for different reasons: Some girls had age- and gender-based expectations placed on them that ensured they stopped along the way to spaces where they performed domestic responsibilities and others did not. By the end of the study, it became clear that these journeys into spaces where gendered divisions of labor were reproduced were mobility-based manifestations of control over the girls' lives exerted by adult stakeholders. This control with respect to the gendered division of labor continued once girls were at home (as noted in sub-section 9.2.2.). The participants were frequently obliged to leave home to run errands to other spaces (e.g. informal market stalls or neighbors' houses) even after darkness fell in the evenings. These interruptions which compelled movements inevitably decreased the time the girls had after school to focus and engage in activities of their choosing.

For other girls, the journeys home from school were more leisurely affairs and the spaces we crossed were done at the girls' behest – without expectations that domestic labor would be performed. This movement was often prolonged as some girls chose to socialize with other people or purchase snacks for themselves. Once home, the freedom they exhibited in physical mobility often mirrored the freedom they had at home to structure their time. Their expected domestic contributions were comparatively minimal, and the free time available equated to at least an hour more than their peers who had to perform more domestic tasks. Use of the two apps in these instances was also observed with more frequency than the other girls.

Similar to what was seen about investigations into girls' time use in the Global South in the preceding section, gendered mobility is again almost always examined with women in mind (Hanson, 2010; Law, 1999; Nare & Akhtar, 2014; Porter, 2011; Salon &

Gulyani, 2010; Srinivasan, 2008; Tanzarn, 2008; Uteng, 2011; Uteng & Cresswell, 2008). Women remain the focus even when mobile phone use is considered in relation to gendered mobility in developing country contexts (Tacchi, Kitner, & Crawford, 2012), despite research which has shown that mobile access among girls, including in Kenya, is growing (Gillwald & Deen-Swaray, 2013). There are also undoubtedly unique virtual mobility constraints that are based on a girls' age that can affect their ability to sustain mobile use<sup>35</sup>.

The number of girl-focused gendered mobility explorations, especially with a focus on school journeys, is relatively scarce (see for exceptions Porter et al., 2010, 2011; Zelezny-Green, 2014). This effectively limits the exploration of the in-between spaces where gendered mobility is more often a constraint for girl children. Moreover, where access to space is enabled or limited for school girls, this appears to have an even more pronounced impact on their time because school participation comes with further time constraints that are not easily set aside.

The concept of mobility as a form of freedom here was therefore a highly influential factor in this study because it affected the girls' after-school time in a manner which had implications for their ability to pursue their desired development outcomes. Again, without changes being made to how, where, through which medium, and for what reasons the learners could move, it was possible that introducing biNu and Worldreader might have enabled some efficiencies and/or flexibility with respect to time use for working towards their goals (Castillo-Merino & Sjöberg, 2008). But ultimately, for girls who had a heavy domestic labor load after school, any efficiencies would have been insufficient to alter extant norms on the use of space and time in meaningful ways which could have contributed to their development outcomes achievement.

#### 9.2.4. Subsidiary Research Question 4

*How, if at all, does access to mobile phones affect the girls' mobile use to IATECAS?*

As referenced in Chapter 4, the economies of scale that have been gained through the mass production of mobile phones, and the rollout of infrastructure in sub-Saharan Africa that broadly makes this technology functional (Aker & Mbiti, 2010), undoubtedly boosted mobile ownership among the study population prior to the start of the AR process. Moreover, looking specifically at the Kenya country context, a number of government policies and regulations have been enacted which make mobile phones widely available and increasingly affordable even for people living in low-income households (Foster & Heeks, 2013).

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<sup>35</sup> Nevertheless, I acknowledge that women will still have their own and likely related gendered virtual mobility issues to contend with.

To take advantage of the educational content offered by biNu and Worldreader, mobile phones needed to be available, affordable, and the girls needed to have the skills to use them. One of the main assumptions I made in the Pre-Intervention phase was that the girls would not be able to afford the mobile data expenditures (financial resources) that would be needed to utilize the two apps. By and large, this turned out not to be the case: The girls took allowances given to them by their parents or guardians to buy mobile credit. When the different areas of ICT access were considered, the knowhow to appropriate mobile phones shaped the girls' ability to work towards their desired development outcomes.

In this study, mobile literacy skills development activities became an integral part of the AR design after the initial workshop where biNu and Worldreader were introduced. This is because the girls' knowledge about completing more complex mobile operations such as searching for specific information, and in books, was still relatively basic. This despite all girls being mobile phone owners for six months or more by April 2014 when the Intervention phase commenced. However, I acknowledged that the length of mobile ownership was probably not the only factor at play here since, as noted in section 7.3, the girls likely had age- and gender-related restrictions which constrained the time they had to develop their mobile literacy skills.

Youth have been celebrated in academic literature for their assumed technological prowess (Palfrey & Gasser, 2008; Sealey-Ruiz & Haddix, 2014; M. Thomas, 2011), including in Africa (Best, 2014; Tustin, Goetz, & Heydenrych Basson, 2012). These assumptions have resulted in the proliferation of some education technology interventions which minimize or altogether eliminate the role of the teacher not only for learning but in providing training on how to appropriate the technology for learning (Mitra, 2015; Negroponte, 2005). This turn of events undoubtedly contributed to a trend where ICT4D interventions in education provided minimal training for end users (Toyama, 2011b; Trucano, 2010). Yet, the enhancement of the girls' educational resources to help them cultivate the skills needed to appropriate the two apps was a critical component in enhancing their sense of choice. The impact of training provision in this study was therefore a necessary input of educational resources. This emphasizes once more the role that better skilled (and often older) adult actors can play in helping children realize capabilities that may be beneficial to their future lives.

#### 9.2.5. Subsidiary Research Question 5

*How, if at all, do policies, discourses, and institutions affect the girls' mobile use to IATECAS?*

The national policy banning students from carrying mobile phones to school in Kenya was a result of the blame students were accorded for using mobile phones to organize themselves to contribute to the 2007-2008 post-election violence. While indeed some children enrolled in school took part in the civil disturbances, they were often mimicking behavior observed by adults in the community – and their actions may have occurred even in the absence of having mobile phones to communicate with one another. By blaming technology for amplifying human intent that already existed (Toyama, 2011a), this government policy cast an extremely negative and seemingly enduring association between youth and mobile phone misuse. The legacy and influence of this policy being enacted is evidenced in the discourses which are being propagated about girls' mobile use in the context.

Discourses about student mobile use at NDSS were decidedly negative, and at times gendered. As discussed in Chapter 6, when some teachers spoke about the girls' mobile use, their utterances often linked to morality in terms of what behavior they expected from their daughters. Girls were not permitted to 'misuse' or 'waste' their time with mobile phones. Nor were girls allowed to find themselves in situations which might invite someone else to 'take advantage' of them. Here, we see a convergence of the increasing pervasiveness of mobile technology and the prevailing idea that girls are in constant need of rescue (Cobbett, 2014). These discourses associated with Kenyan girlhood in the digital era are by no means unique. Characterizations of what 'good girls' do and what they must avoid when appropriating mobile phones are pervasive throughout most cultures, and countries in the Global South are no exception (Bosch, 2011; Burrell, 2010; Kihwele & Bali, 2013; Leoschut, 2015; Pype, forthcoming; Sey, 2011).

These discourses are passed down over time from adults to the children they are responsible for looking after, and reproduced by them in turn. In Chapters 6 and 7, we saw what was likely the manifestations of these intergenerational discourses when some research participants shared that they regulated when, for how much time, and for which purposes they used biNu and Worldreader, lest they appear to contravene the vision crafted by adult stakeholders of what their mobile use should look like and entail. In essence, discourses affected the intervention by shaping how the girls were (dis)empowered to appropriate the two apps. But these discourses not only pervaded the learners' homes, they were also replicated in their school at times.

Many waking hours the research participants spent during the academic year were at NDSS. In this respect, school as an institution played a significant role in the formative years of the girls' lives, and at a time when capabilities development for their futures and their choices to lead valuable lives should be undertaken. Yet, part of this system was

enforcing the ban on mobile phones even though, as documented in Chapter 6, many of the teachers and Principal Sumba used their mobile phones on campus for personal use, to study, to help them teach, or for professional development purposes. This created a 'do as I say and not as I do' relationship with mobile when faculty and staff were seen by the girls using the devices on campus. It also possibly signaled to the girls that the adults might not be actively working to enhance the girls' future capabilities (Saito, 2003) by limiting the girls' use of a technology the adults themselves seemed to see as instrumental for enhancing their own agency.

The actions the learners saw at school from adults was likely confusing messaging given the discourses about the supposed dangers of mobile use by females. The lack of clarity about what was permissible could have contributed to Zeituni's decision to carry her phone to school in secret because of the utility she saw it could have for adults in that space (see **sub-section 8.3.4.** for her experience). This is not to say that school personnel were exhibiting bad behavior, especially since the ban was not applicable to them, or that students should be allowed to do everything that the adults do. Nevertheless, it is notable that NDSS faculty and staff valued using mobile phones at school because of how the technology enhanced their lives, in some cases including with respect to their own education, yet were complicit in limiting this opportunity for others they were charged with nurturing into informed and responsible adults.

Overall, even though people in this context complied with the relevant policy and repeated the discourses about why girls should not use mobile phones at school, one impact of these structural elements on the study were acts of resistance like Zeituni's. By carrying her phone to school despite the ban, Zeituni was enabled to use it on the journey home from school for similar reasons that some adults used theirs on campus (e.g. mobile reading). The situation was yet another instance in which the girls might have felt compelled to question a perceived injustice in how their behavior was controlled in a manner which they felt stifled their ability to lead lives they had reason to value.

#### 9.2.6. Subsidiary Research Question 6

*How, if at all, does the resource portfolio available to the girls affect their mobile use to IATECAS?*

Focusing on the girls' resource-based agency was important because the process of working towards their three expressed development outcomes, choice to increase access to educational content after school, to be able to improve their grades, and to have academic success, were affected by the resources they had available and could effectively utilize within their individual structures.

In the latter half of Chapter 6, I focused on time and its relationship to the other resources the girls indicated had an effect on their education. What the analysis underscored was that the complex constellation of interconnections between the girls' resources and their education was not readily apparent if personal characteristics such as their age and gender were not considered. However, these personal characteristics were just as relevant when considering structure since, in many cases, structure was inextricable from the resources the girls used within it. Furthermore, because they are girl children, many of their personal characteristics appeared to subject them more intensely to the influence of structure.

Through an innovative research method to operationalize resource-based agency, I found through the data analysis that although some resources played more subtle roles when compared to others, all 11 resources in the Choice Framework influenced the girls' education – and by extension their mobile appropriation to access educational content. These influences often emerged over time or had other temporal correlations linked to their personal characteristics. We also earlier saw that, with space to reflect, the girls had the acuity to identify agency constraints linked to norms to which they were expected to adhere. Though, if they could not identify structural inequalities they experienced when attempting to draw on their resource-based agency, the girls were less likely overcome these constraints – especially without support from more experienced stakeholders.

With these associated findings recounted herein, I will now discuss the contributions that were made in this thesis.

### 9.3. Thesis Contributions

In this thesis, I sought to learn if action research with 22 girls from New Day Secondary School might help them realize three voiced development outcomes:

1. Choice to increase access to educational content after school,
2. To be able to improve their grades, and to
3. Attain more academic success.

Based on the activities undertaken and outcomes documented during this 13-month study, I will now discuss the contributions made through this work.

#### 9.3.1. Theoretical Contributions

Given the interdisciplinary nature of this study, I engaged with literature in several areas including information and communication technologies for development, education, geography (particularly time and mobility), and girlhood studies. The normative framework applied was the people-centered conceptualization of development known as the capability approach. By carrying out a capabilities-based evaluation, through this thesis, I

demonstrated how consideration of threads from ICT4D, education, geography, and girlhood studies can form insights about girls' lives after school.

While children have been considered extensively as subjects in the capability approach to education (M. Walker & Unterhalter, 2007), concerns children may have beyond formal education experiences, especially during the after-school hours, have not been fully explored in the CA (see for an exception Iervese & Tuttolomondo, 2014). The case studies developed presented examples of how the Choice Framework as a tool to operationalize the CA has potential application to support future studies which might theorize girlhood in the Global South. This is notable given that only a handful of girlhood studies researchers have conceptually linked the capability approach to their work (see for examples Alhassan & Odame, 2013; Khoja-Moolji, 2015; Lefebvre, Pekol, & Krause, 2015).

It has been challenging for scholars using the capability approach to reconcile the goal of freedom expansion which the approach espouses with the fact that children's freedoms are often curtailed because of their age (Bessant, 2014). This contradiction has resulted in a call to understand how aging as a development process influences the real freedoms a child is able to enjoy (Ballet et al., 2011). There has especially been a push to view children as active subjects who may need support from a more experienced individual to make informed choices as they age, and children may then learn to evaluate these choices and potentially avoid making some choices over others in the future (ibid.). This study adds to the discussion of all three of these threads, although the depth of this discussion here was at times challenging to achieve given the breadth of human development components that the CF encompasses and the space limitations of this thesis.

While Kleine's operationalization of the capability approach enhanced Sen's (1999) work by emphasizing the role of structure, in her own use of the Choice Framework to date she has yet to critically examine how age as a personal characteristic can be an important component of agency in ICT4D interventions. I argued that this was problematic because personal characteristics such as age and gender can substantially constrain a girl's real freedoms – more so when these factors are combined – and are not limited to exerting their influence just on people's resources. This was evidenced by the ways that adults created norms on the usage of space and time and the access to ICTs to alternately constrain or expand the research participants' ability to use their mobile phone to IATECAS, in many instances because of their daughter's age and gender.

By using the CF to evaluate this study, one objective was to enable holistic engagement with and understanding of girl children as agents in an ICT4D intervention. In doing so, a further theoretical contribution of this study was to demonstrate how one operationalization of the CA (the Choice Framework) might help identify and interrogate



inequalities experienced by girls, especially in initiatives that explore how ICTs might be appropriated to support their ability to lead the lives they have reason to value. Finally, through the work in Chapter 7 on the four degrees of empowerment, this thesis contributes further to theoretical engagement with and assessment of the achievement of choice. To date, Kleine (2007; 2012) and Alsop and Heinsohn (2005) represent just a handful of examples that have helped elaborate and demonstrate what this concept is. Therefore, it is hoped that this particular theoretical contribution supports further empowerment work elsewhere by helping concerned people and organizations understand what is meant by the achievement of choice and what this looks like conceptually.

### 9.3.2. Methodological Contributions

With respect to ICT4D, this thesis has contributed the development of a methodology for carrying out a holistic and critical look at a development process for people who have been experienced the effects of inequality in their respective societies. This is something that ICT4D scholars have long called for (Harris, 2016; Unwin, in press; 2009) but which remains slow-growing in terms of exemplars (see for exceptions Gigler, 2015; Hatakka, Andersson, & Grönlund, 2013; Oosterlaken, 2013; Roberts, 2016).

In this study, the depth, breadth, and criticality demonstrated in the methodology was guided by the Choice Framework (Kleine, 2013). This tool was conceived with the intention of aiding people as they worked to increase choice in partnership with others. As I noted earlier in section 3.5, my own decision to utilize the Choice Framework was taken because it could help surface deeper insights from the research context, despite the criticisms that it appears to be methodologically challenging to apply due to the volume of points to be considered. Furthermore, the CF was used because it served multiple purposes: It was used to conduct an evaluation of an action research project, and to help refine context mapping and research design processes.

There have been at least two previous examples of action research where the Choice Framework has been applied (Kleine, 2011a; Kleine et al., 2012; Poveda, 2015). These studies provided a precedent from which to join this tool to a research practice concerned with affecting positive change. Moreover, by combining the capability approach with action research, I demonstrated how a comprehensive formative evaluation can be systematically undertaken to assess intervention impact with a group of individuals who have face many difficulties to lead lives they have a reason to value. The AR process made it possible to initiate adjustments to research activities when necessary to better and more deeply explore salient themes in situ.

There have been at least three different approaches taken to helping children identify the structural elements and resource-based agency components which form their

capabilities: applied descriptive statistics gathered through mixed methods (Biggeri, Libanora, Mariani, & Menchini, 2006b), a structural equation model (Di Tommaso, 2007), and a mixed methods approach which combined research activities based on participatory rapid appraisal (Biggeri & Anich, 2009). I developed an innovative research method, the resource portfolio card game, to operationalize Kleine's (2013) concept of resource-based agency. I explored, through a visualization exercise of the resources (see **sub-section 5.6.3.2.**, **section 6.3**, and **Appendix K**) the girls' perspectives on which components of agency, if any, influenced their education and how. The research method enabled the girl children to articulate, in their own words, the valued doings and beings they had, lacked, and wished to cultivate. The creative approach taken with this research method was child-friendly insofar as localized drawings were created to convey what each resource meant in addition to providing a verbal explanation to enhance clarity. This exercise contributed to the girls' ability to identify injustices that they perceived with respect to their resource-based agency and personal characteristics, eventually helping them to question why they had to contend with these circumstances.

Overall, the resource portfolio card game adds a qualitative method which can be utilized to identify, measure, and compare children's resource-based agency, and to a certain extent their capabilities, building on techniques used elsewhere for the same purpose. Since its creation in 2014, this method has been applied in research in Kenya with young women studying in the ICT sector (Muyoya, 2016) and with learners at a secondary school in rural South Africa (D. Kleine, personal communication, February 20, 2015).

One last methodological contribution I wish to highlight is mobile data collection to generate actual app usage statistics. While direct observation of mobile-based activities is not novel as a research method (Böhmer, Hecht, Schöning, Krüger, & Bauer, 2011; Pielot, Dingler, Pedro, & Oliver, 2015; Taylor, 2016; Wei, 2007), there are few ICT4E projects that use this type of data to triangulate self-reported data generated through qualitative methods (Trucano, 2005).

Because this research utilized mobile phones and two apps with which it was possible to capture the girls' app usage statistics, I verified claims research participants made about their mobile app usage that I was unable to observe directly. This approach to triangulation was instrumental in strengthening the documented findings since there was independent verification of book types read, days the two apps were accessed, and the length of time the apps were used. Looking more broadly at ICT4E, for other researchers who might employ this approach to triangulating data, it could help guard against the production of hyperbolic claims in ICT4D built on taking at face value respondents'

(techno)optimistic statements about benefits and outcomes they have experienced during an intervention.

Moreover, examining the actual app usage statistics provided a basis from which to consider the cost of accessing educational content after school with the two mobile tools introduced when compared to the access costs the girls had pre-intervention. As the Piper et al. (2016) study from Kenya illustrated, it is important to consider cost effectiveness when deciding whether to adopt a technology-based solution to address an issue in education. This is because even if the technology is effective in helping to achieve desired outcomes, it may not be the least expensive means to realize that accomplishment. In this study, particularly in Chapter 7, we saw that prior to the Intervention phase, the cost for the girls to purchase textbooks or other educational content for after-school use was high relative to their household income, and to purchase one science textbook cost a minimum of 100 KES. By comparison, after-school access to educational content via Worldreader and biNu for a week during which multiple books could be accessed and read cost just 5 KES for a mobile data bundle which made this access possible. While further studies are needed to examine the cost effectiveness of introducing the two apps when compared to accessing paper-based materials after school, the findings suggest that for the purposes the girls in this study had in mind, the two mobile tools appeared to be cost effective where increasing their access to educational content after school is concerned.

It is hoped that by openly publishing this data, it will encourage other ICT4D researchers to view this method as one which encourages transparency about actual impact and cost effectiveness claims.

### 9.3.3. Empirical Contributions

In this thesis, I constructed a picture of life after school for 22 girls enrolled in a secondary school in Nairobi. I collected, analyzed, and shared participant observation data for six of these research participants, with a focus on a period that is underexplored in the literature, the after-school hours between 6:00pm and 10:30pm. This information included thick descriptions of journeys home from school whereby mobile ethnography was used to conduct interviews in motion (Porter et al., 2010). I also collected ancillary data about the nature of these journeys by documenting the embodied experience of the quotidian walks in my research diary (M. Hope, 2009). As previously highlighted (see **sub-section 9.2.3.**), journeys taken from school with children are important for understanding their after-school lives yet have not often been examined by other researchers. Therefore, by documenting these experiences in Chapter 8, I contributed empirical data with the intention of furthering understanding about how the experience of physical mobility can

reflect, to a certain extent, the freedoms that girls might enjoy once they arrive home from school.

Once in their homes, I undertook systematized participant observation activities guided by the Choice Framework which enabled me to understand the amount and type of play and leisure, learning, family and/or social interactions, domestic labor, mobile appropriation, and/or care work the girls contributed to, if at all. I also detailed conditions of the places the girls lived, the people who lived with them, as well as the routines which formed their after-school schedules and were revealed over time. By starting out at NDSS at 7am and finishing an observation at a girl's home by 10:30pm, I had the opportunity to spend much of a 24-hour period with six research participants. The sum of this time and data collected enabled me to articulate intimate insights into how girlhood was constructed for a quarter of the research participants, all of whom came from low-income households. It also provided the opportunity to observe the girls engaging in mobile use practices in a more natural and relaxed environment when compared to the home science classroom after school where most of the research activities were conducted in this study.

This is one of a steadily growing number of studies conducted in a Global South context where a variety of qualitative and quantitative research methods have been used to build windows into children's lives outside of school (see for examples Mensch & Lloyd, 1998; Milligan, 2014; Ndiritu & Nyangena, 2011; Orkin, 2012). Furthermore, by electing to work after school with Kenyan secondary school girls as the research subjects, I was able to contribute rare empirical data to girlhood studies, an area of academia where Global North experiences are predominant (Weems, 2009), especially where after-school settings are the space of consideration.

In the penultimate section of this chapter, I will make suggestions for future areas of research.

#### 9.4. Future Areas of Research

We have seen here how time, or the lack thereof, was a significant source of unfreedom in this context. Time's (often negative) effect on the girls' agency was amplified by structural and resource-based agency constraints in the spaces the girls traversed after school, including their school, NDSS, and their homes. Likewise, the learners' physical and virtual mobilities were controlled by adult actors so that some girls had better opportunities than others to lead lives that they have reason to value. The research participants' ages meant that their reliance on adults was necessary; their gender meant that they were expected to be complicit in adhering to norms which often perpetuated inequalities. In such circumstances, if education technology is introduced as part of local or national initiatives, then research should be undertaken in parallel to understand how schools and family

members can best support their (girl)children as they attempt to benefit from these initiatives. In doing so, it is hoped that more ways could be revealed to help people who encounter marginalizing forces to challenge and eventually change their circumstances so that they might be in a better position to benefit from projects and programs intended to enhance their (future) freedoms.

As the findings showed, a child's capabilities development is often dependent on the capabilities of the adults in her life. Although supportive, most of the girls' parents and guardians in this study did not engage much with the research their daughters participated in, likely due to their own time constraints. It would have been interesting to learn if they also found utility in the apps, much like what was captured in Chapter 8 from Leanta's experience with her mother in church (reading the Bible via Worldreader) and in Chapter 7 from Lupita's mother asking me to install biNu on her mobile phone. Therefore, future research concerned with ICT4E interventions might ask, in addition to offering support to their children, how parents and guardians can become integral parts of the research process in a manner that might also benefit them.

Because detailed and girl-specific data about how after-school hours are spent is relatively scarce in Global South contexts, during the study, I gathered data about the girls' after-school time use through direct observation. The limitation in doing so was that there was no guarantee that once comfortable, the girls actually exhibited their 'usual' behaviors and practices when being observed. Accordingly, it would be useful to investigate how girls' after-school hours could be constructed by adapting existing time use surveys (J. Walker et al., 2014) and/or diaries in ways that enables girls to complete them independently and without contributing to feelings of being surveilled. Although it is not guaranteed that this research method would yield better data when compared to direct participant observation, it could provide a useful means with which to understand through triangulation how girls' after-school hours are constructed. This could be achieved by analytically commingling the lived experiences of these hours (direct observation) with the girls' perceptions of what it is like to live through these hours (time use surveys or diaries). Knowing with more precision the amount of time that girls have available after school – and what they (are permitted to) do with this time – is crucial for girls' education, including in the Global South. This is because a lack of time can have a strong effect on a girl's ability to enhance her educational resources during these hours, among other impacts.

Finally, future research might also investigate other personal characteristics which girls embody as part of their agency that render time and mobility sources of unfreedom during after-school hours, and how these factors can be minimized or eradicated altogether.

## 9.5. Looking Ahead

As the digital age progresses and people continue to appropriate technologies and innovations to help them lead lives they have a reason to value, education is one sector in the Global South where there is potential to help girl children enjoy more freedoms after school. It has long been recognized that enhancing educational resources can help people unlock other capabilities (Sen, 1999), and ICTs in education have also been acknowledged as development catalysts (Selinger, 2009). However, any potential to be realized for girl children via ICT4E will undoubtedly be framed by the nature of the education being pursued (Unterhalter, 2003b), the resources available, the influence of structural elements, the girls' personal characteristics, and the role of parents, guardians, and other adult stakeholders in their lives.

Even the best laid plans to support children's after school learning with education technology will be futile if systemic inequalities remain unaddressed. Moreover, time is a key resource without which material resources can be useless. There needs to be a reimagining of the role played by parents, guardians, and other adult stakeholders – including teachers –so that they can be positioned as stewards who can support girl children's attempts to lead lives they have reason to value, now and in the future, and in ways that enhance and not constrains their daughters' real freedoms. If a narrow focus is placed on technology use to resolve issues (like a lack of access to educational content after school) without identifying and working to eliminate the unfreedoms which caused the deficiency to begin with, then the likelihood that freedom will be expanded just through an isolated intervention or addition of two resources is low. In the push towards sustained, more equitable development, people will remain far more important than the technology – irrespective of their age or gender.

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## APPENDIX A: New Day Secondary School Research

### Participant Demographics

Learner	School Level	Age	Ethnicity <sup>36</sup>	Mobile Phone Type Owned	biNu compatible phone? (Y/N)
1. Ada	Form 2	15		Feature phone	N
2. Ann	Form 2	16		Smartphone	Y
3. Ayesha	Form 2	17		Basic phone	N
4. Beryl	Form 3	17		Feature phone	Y
5. Damaris	Form 2	16		Smartphone	Y
6. Elaine	Form 2	17		Feature phone	Y
7. Esther	Form 3	16		Feature phone	Y
8. Everlyne	Form 2	17		Smartphone	Y
9. Faith	Form 3	17		Basic phone	N
10. Gertrude	Form 3	17		Basic phone	N
11. Gloria	Form 3	16		Feature phone	N
12. Halima	Form 3	16		Feature phone	N
13. Leanta	Form 3	18		Basic phone	N
14. Linda	Form 3	17		Basic phone	N
15. Lupita	Form 2	16		Feature phone	Y
16. Marie	Form 3	16		Basic phone	N
17. Mercy	Form 3	16		Basic phone	N
18. Nancy	Form 3	16		Basic phone	N
19. Shikoh	Form 3	16		Feature phone	N
20. Susan	Form 3	17		Basic phone	N
21. Wangari	Form 2	14		Feature phone	N
22. Zeituni	Form 3	15		Smartphone	Y

<sup>36</sup> The data for the girls' ethnicities was redacted to avoid the possibility of the retro-identification of the research participants through this data.

## **APPENDIX B: New Day Secondary School Parent or Guardian Research Participation Permission Request Letter**

Dear New Day Parent or Guardian,

Habari, my name is Ronda Zelezny-Green. I am a PhD student at the University of London. For nearly two years I have been working with the New Day Secondary School community as a researcher and occasional teacher.

From February to June 2014, I will be conducting research **after school** at New Day with your daughter/student, and sometimes in your home. I am conducting research to learn more about your daughter/student and her life during after-school hours, particularly Monday-Friday. This research focuses on your daughter/student's learning activities with a special interest in how she uses or may use a mobile phone after school. This research asks: "How, if at all, might the introduction of mobile apps impact the girls' desired primary development outcome of having choice to increase their access to educational content after school?"

The information gathered to answer this question will be analyzed and may be used as part of my PhD thesis, conference presentations, and/or academic publications. This research has been approved by the Kenya Institute of Curriculum Development (KICD) (formerly KIE), and the KICD letter of support for this research is on file with the New Day principal, Mrs Patricia Sumba<sup>37</sup>. Should you want to see this letter at any time, please just make an appointment with Mrs Sumba.

During this research, I will be working with a research assistant, Ms Angela. Angela is a former New Day student and has received formal research training to conduct research with me. She will work after school with your daughter/student and may also join me on home visits.

Your daughter/student may be asked to bring her mobile phone to school approximately five times between February and June 2014. However, her phone will be taken upon arrival and she will only use it after school (3:30pm or later) for purposes related to this research.

The activities that this research involves includes: discussions, games, mobile activities, and surveys. Your daughter/student will always have the ability to refuse to participate in any research activity she does not want to complete. At any time, you may also refuse permission for your daughter/student to participate in this research.

On average, I will be working with your daughter/student approximately one day per week after school. This research will not interfere with classroom instruction or the ability to study when school is finished each day.

If you have any questions or concerns about the research, you may contact my PhD supervisor, Dr Dorothea Kleine at +44 1784 276223 or [Dorothea.Kleine@rhul.ac.uk](mailto:Dorothea.Kleine@rhul.ac.uk). I am also reachable at +254 774 079 737 or [ronda.zelezny-green.2011@live.rhul.ac.uk](mailto:ronda.zelezny-green.2011@live.rhul.ac.uk). If you grant permission for your daughter to participate in this research, please sign below and have your daughter or student return this letter to school to Mrs Julie Omolo or Ms Angela. Thank you for your time and consideration!

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<sup>37</sup> As with the rest of this thesis, all names and other identifying information has been anonymized.

## APPENDIX C: After-School Participant Observation Chart

Learner (name of student):			Date:			
Time			Length of observation			
Setting description			People present			
Activity	Start time	End time	Location	What tools did the girl use?	What tools did the girl NOT use, but the tool was present in the room?	Does the girl have any time limits for the activities she does? Elaborate on them.
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						

### ADDITIONAL NOTES

1. **SPACE** Describe how the spaces the girl travels to affect her ability to learn during after-school hours. Is the space noisy? Too small? No light to see to read and study? TV or radio being used by other people while the girl is trying to learn? Other people acting as distractions? Provide details on the different spaces the girl goes to.

2. **NORMS** What obligations or responsibilities does the girl have that affects her ability to learn after school? Why does she have these obligations or responsibilities? Who (such as parents, guardians, siblings) makes sure that the girl completes these obligations or tells her that she must complete them before she can learn after school?

## **APPENDIX D: Pre-Intervention phase, March 2014 – Semi-Structured Interview Guide**

1. What do you define as learning?
2. Is learning something you can only do at school? Why or why not?
3. What kind of learning do you do, if any, when you are not in school?
4. What do you use your mobile phone for, if for any reason, when you are not at school?
5. What, if anything, do you like about your mobile phone? Why?
6. Is there anything you do not like about your mobile phone? Why?
7. Have you ever used your mobile phone to learn something?
8. What rules, if any do you have for where you can use your mobile phone? What are they/is it?
9. What rules, if any, do you have for how much time you can use your mobile phone? Please explain.
10. Are there any more rules related to your mobile phone use?
11. Who makes these rules?
12. Some people say that girls should not use their mobile phone when they are not in school. Is that true?
13. What do you wish to know how to do, if anything, with your mobile phone? Why?
14. Do you feel confident that you know how to use a mobile phone well? Why or why not?
15. Is there anything else you want to tell me about your mobile phone use when you are not in school?

## **APPENDIX E: Intervention phase, June 2014 – Semi-Structured Interview Guide**

1. What is your most important goal for your education through November?
2. What, if anything, has been your biggest barrier to achieving this goal to date?
3. Do you think using the app will help you to meet your goal?
4. How often, if at all, would you say you use the app each week?
5. Is there anything that might make you use it more often?
6. Is there anything that might make you use it less often?
7. Do you feel you know all you need to know to get the information from biNu on your own?
8. Is there anything else you want to say about your participation in this intervention?

# APPENDIX F: Focus Group Discussion Guide – Pre- Intervention Phase

## Introduction and permission request:

Jambo, thank you so much for taking the time to meet with me today. As you remember, my name is Ronda Zelezny-Green and I am a PhD student at the University of London. I am a teacher as well, and enjoy teaching English and ICTs, and supporting girls' education.

I have invited you here because I want to ask you some questions about your ideas on learning and knowledge, as well as your mobile phone use when you are not at school. The information gathered to answer these questions will be analyzed and may be used as part of my PhD thesis, conference presentations, and/or academic publications. However, anything you say will remain **confidential**. I will not tell anyone else what you have told me and your real name will never be used or written anywhere in my thesis.

Please understand that you may refuse to participate in this focus group. If you refuse to participate in the focus group or withdraw during the focus group, this will not affect you in any way. All of your responses are **voluntary**. Other New Day students, the teachers and the principal will not be able to know the responses that you may choose to give to me. I will also not tell your parents or anyone else in your family what you tell me. This is a safe space.

The focus group should take about 45 minutes to complete. After that, we will have a role play activity; in total, I will need about one hour and 30 minutes of your time.

With your permission, I would like to record the focus group. This is so that I can focus on what you are saying. However, if you want, I can simply take notes of what you have said.

**RECORDING:** If you agree to participate, please state your name and whether or not you are willing to participate in the focus group.

**NO RECORDING:** If you agree to participate, please sign your name and indicate whether or not you are willing to participate in the focus group.

Please remember that I want to hear what you have to say, so please be as honest as possible because this will help other girls at New Day Secondary School and also in Kenya. If you have any questions during the focus group, please let me know. Before we start, are there any questions? Okay, let's begin.



1. What, if anything, do you like about your mobile phone? Why?
2. What, if anything, do you dislike about your mobile phone? Why?
3. What, if anything, would you give up in order to keep your mobile phone? Why?
4. Right now, do you have any rules for where you can use your mobile phone?
5. If so, what are they/is it?
6. Right now, do you have any rules for how much time you can use your mobile phone?
7. If so, what are they/is it?
8. Are there any more rules related to your mobile phone use?
9. Who makes these rules?
10. What, if anything, does your parent or guardian think about you using the mobile phone after school?
11. Does anybody else comment about you using the mobile phone after school?
12. If so, who are they?
13. What have they said?
14. Is it easy or more challenging to use your mobile phone now when school is in session?
15. Is there anything else you want to tell me about your mobile phone use after school?

# APPENDIX G: Focus Group Discussion Guide – Intervention

## Phase

### Introduction and permission request:

Jambo, thank you so much for taking the time to meet with me today. As you remember, my name is Ronda Zelezny-Green and I am a PhD student at the University of London. I am a teacher as well, and enjoy teaching English and ICTs, and supporting girls' education.

I have invited you here because I want to ask you some questions about your ideas on learning and knowledge, as well as your mobile phone use when you are not at school. The information gathered to answer these questions will be analyzed and may be used as part of my PhD thesis, conference presentations, and/or academic publications. However, anything you say will remain **confidential**. I will not tell anyone else what you have told me and your real name will never be used or written anywhere in my thesis.

Please understand that you may refuse to participate in this focus group. If you refuse to participate in the focus group or withdraw during the focus group, this will not affect you in any way. All of your responses are **voluntary**. Other New Day students, the teachers and the principal will not be able to know the responses that you may choose to give to me. I will also not tell your parents or anyone else in your family what you tell me. This is a safe space.

The focus group should take about 45 minutes to complete. After that, we will have a role play activity; in total I will need about one hour and 30 minutes of your time.

With your permission, I would like to record the focus group. This is so that I can focus on what you are saying. However, if you want, I can simply take notes of what you have said.

**RECORDING:** If you agree to participate, please state your name and whether or not you are willing to participate in the focus group.

**NO RECORDING:** If you agree to participate, please sign your name and indicate whether or not you are willing to participate in the focus group.

Please remember that I want to hear what you have to say, so please be as honest as possible because this will help other girls at New Day Secondary School and also in Kenya. If you have any questions during the focus group, please let me know. Before we start, are there any questions? Okay, let's begin.

1. What, if anything, do you like about your mobile phone? Why?
2. What, if anything, do you dislike about your mobile phone? Why?
3. What, if anything, would you give up in order to keep your mobile phone? Why?
4. Right now, do you have any rules for where you can use your mobile phone?
5. If so, what are they/is it?
6. Right now, do you have any rules for how much time you can use your mobile phone?
7. If so, what are they/is it?
8. Are there any more rules related to your mobile phone use?
9. Who makes these rules?
10. What, if anything, does your parent or guardian think about you using the mobile phone after school?
11. Does anybody else comment about you using the mobile phone after school?
12. If so, who are they?
13. What have they said?
14. Is it easy or more challenging to use your mobile phone now when school is in session?
15. Do you think using biNu and Worldreader on your mobile phone has helped you work towards your educational goal(s) since January? Why or why not?
16. Is there anything else you want to tell me about your mobile phone use after school?

## APPENDIX H: Pre-Intervention Phase Survey Instrument

### Introduction and permission request:

Jambo! My name is Ronda Zelezny-Green and I am a PhD student at the University of London. I am here at New Day Secondary School conducting research. I am trying to learn more about you and your life after school, particularly your learning activities.

This information will be analyzed and may be used as part of my PhD thesis, conference presentations, and/or academic publications. Anything you say on the survey will remain confidential. I will not tell anyone else what you have written, and your real name will never be used or written anywhere in my thesis.

If you have any questions or concerns about the survey, you may also contact my PhD supervisor, Dr Dorothea Kleine at +44 1784 276223 or Dorothea.Kleine@rhul.ac.uk.

Please understand that you may refuse to participate in this survey. If you would rather not participate in the survey or stop the survey before it is finished, this will not affect you in any way. Other New Day students, the teachers and the principal will not be able to know the responses that you write. I will also not tell your parents or anyone else in your family what you write.

I would appreciate your time to complete this survey. The survey, which has a total of 5 pages on the front and back of each piece of paper, should take about 30 minutes.

If you agree to participate in this survey, please sign your name here:

---

If you do not wish to participate in this survey, please just leave your paper blank.

Please remember that I want to hear what you have to say, so please be as honest as possible because this will help other girls at New Day Secondary School and also in Kenya. Your experiences are important and I hope you can share as much as you feel comfortable sharing. There are no right or wrong answers, I just want to hear your ideas.

If you have any questions during the survey, please let me know. Before we start, are there any questions?

I thank you very much for your time.

These questions relate to who you are and what are your learning activities.  
Please answer each question. If you do not understand, please raise your hand.

**PLEASE PRINT YOUR ANSWERS UNDER THE QUESTION.**

1. What is your name?
  
2. How old are you?
  
3. What is the name of the place or neighborhood where you live?  
(For example: Makadara, Makongeni, Eastleigh, Umoja, etc.)
  
4. Are you a boarder/boarding student? **Please tick ONE.**  
  
Yes  No
  
5. What is your ethnicity? (For example: Kamba, Embu, Turkana, Maasai, etc.)
  
6. Please list the things, if any, you use after school to **help you learn.** (For example: books, pencil, CD, etc.)
  
7. What is your favourite thing, if any, to use after school to **help you learn**?
  
8. Why?
  
9. What are your objectives for your education, if any, **during the next six months**, until July 2014?

10. Please write what you **usually do** each day after-school and write the times that you do these things.

**At 4pm, I....**

11. On average, how much time do you have after school, if any, for learning and studying each day?

12. How much time would you use to learn after school, if any, if you could make your own schedule?

13. Please list the places, if any, where you learn when school finishes each day. (For example: library, church, home, cyber café, etc.)

14. Of the places listed in question 16, **where do you like to learn most** when school finishes each day?

15. Why?

16. From the group of words below, please **circle** all the words that you think are associated with learning.

curiosity, competition, scary, friends, interesting, valuable for the future, selective, fun, pressure, advancement, high expectations, expensive, developing my interests, boring, strict, hard work, unpredictable, rewarding, something I can teach others, demanding, knowledge, elite, creativity, development, makes me a better person, difficult, affordable, intense, worthwhile, challenging

Other (please write any other words you associate with learning):

---

The next questions relate to mobile phones. Please answer the question only if it applies to you.

17. Do you have a SIM card? **Please tick ONE.**

Yes  No

If you tick "No", please go to **Question 20.**

18. How many SIM cards do you have? **Please tick ONE.**

1  2  3 or more

19. Who gives you mobile network service? **Please tick all that apply to you.**

Airtel  Orange  Safaricom  Yu

20. Do you own your own mobile phone? (You are the person who uses the phone most.)  
**Please tick ONE.**

Yes  No

If you tick "No", please go to **Question 28** on page 5.

21. From whom did you get your mobile phone? **Please tick ONE.**

Parent/guardian  A friend  My boyfriend  My sister  My brother

Other : Please write \_\_\_\_\_

22. What kind of phone do you own? (For example: Nokia 5510, Samsung Duos, etc.)

23. Can your phone take photos?  
**Please tick ONE.**

Yes  No

24. Does your phone have the ability to access the Internet? (Not only Facebook)  
**Please tick ONE.**

Yes  No

25. Please list the activities that you know how to do using your mobile phone.

26. Are you always able to use your mobile phone after school when you need it?  
**Please tick ONE.**

Yes  No

27. If you ticked "No" to Question 26, please tell me why you cannot use your mobile phone after-school when you need it:

28. If you do not have your own mobile phone, can you borrow a mobile phone when you need to use it after-school?  
**Please tick ONE.**

Yes  No

If you tick "No", please put your pencil down. The survey is now complete.

29. Could you borrow a mobile phone **every day** after-school if you need it?  
**Please tick ONE.**

Yes  No

If you tick "No", please put your pencil down. The survey is now complete.

30. If you ticked "Yes" for Question 28 and Question 29, from whom could you borrow a mobile phone every day? **Please tick ALL that you can borrow from.**

Parent/guardian  A friend  My boyfriend  My sister  My brother

Other : Please write \_\_\_\_\_



# **APPENDIX I: Intervention and Evaluation Phases Survey**

## **Instrument**

### **Introduction and permission request:**

Jambo! My name is Ronda Zelezny-Green and I am a PhD student at the University of London. I am here at New Day Secondary School conducting research. I am trying to learn more about you and your life after school, particularly your learning activities.

This information will be analyzed and may be used as part of my PhD thesis, conference presentations, and/or academic publications. Anything you say on this survey will remain confidential because the survey is anonymous and you do not have to give your name.

If you have any questions or concerns about the survey, you may also contact my PhD supervisor, Dr Dorothea Kleine at +44 1784 276223 or Dorothea.Kleine@rhul.ac.uk.

Please understand that you may refuse to participate in this survey. If you would rather not participate in the survey or stop the survey before it is finished, this will not affect you in any way. Other New Day students, the teachers and the principal will not be able to know the responses that you write. I will also not tell your parents or anyone else in your family what you write.

I would appreciate your time to complete this survey. The survey, which has a total of 2 pages, should take about 10 minutes.

If you do not wish to participate in this survey, please just leave your paper blank.

Please remember that I want to hear what you have to say, so please be as honest as possible because this will help other girls at New Day Secondary School and also in Kenya. Your experiences are important and I hope you can share as much as you feel comfortable sharing. There are no right or wrong answers, I just want to hear your ideas.

If you have any questions during the survey, please let me know. Before we start, are there any questions?

I thank you very much for your time.

1. What tools, if any, do you use after school to support your learning?
2. What words, if any, do you think of when you think of biNu and Worldreader?

Scaled Responses for Questions 3-11

<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neither Disagree, Nor Agree</b>	<b>Agree</b>	<b>Strongly Agree</b>
--------------------------	-----------------	--	--------------	---------------------------

3. BiNu is not a helpful tool for learning.
4. When I am at home after classes, I have distractions when I am using biNu.
5. My parent or guardian does not prevent me from using biNu.
6. biNu is a helpful tool for informal learning.
7. Mobile phone credit is not my biggest challenge using biNu.
8. I believe I know how to use biNu to read.
9. biNu has not helped me with my studies.
10. I only use biNu to help me with my studies.
11. I do not have enough time to use biNu after classes each day.
  
12. What, if any, is your favorite biNu app and why?
13. What, if any, is your least favorite biNu app and why?
14. What, if any, other apps do you wish biNu had?
15. What, if anything, do you want to know how to do most with biNu?
16. What activity, if any, do you use biNu for the most and why?
17. What activity, if any, do you use biNu for the least and why?

# APPENDIX J: Ranking and Association Activity Research

## Method Steps

### List of items needed

#### Tools

1. mobile phone
2. TV
3. computer
4. radio
5. book
6. textbook
7. revision book (Golden Tips)
8. pencil
9. Biro (pen)
10. newspaper
11. CDs
12. Calculator
13. Rubber eraser
14. Ruler
15. Past papers
16. Encyclopaedia

#### Places

1. Home
2. Cyber café
3. Library
4. Church/Mosque
5. Friend's house
6. Study room
7. School

#### Procedure

1. Present all tool realia and drawings. Ask the girls if they think there are any present that cannot be used for learning. [If a tool is identified as such, ask why and note this.]
2. Present all location drawings. Ask the girls if they think there are any present where learning cannot take place. [If a location is identified as such, ask why and note this.]
3. Ask the girls to name any tools they think are missing from the collection. Add the names of these tools to a sheet of paper and add to the group of tools.

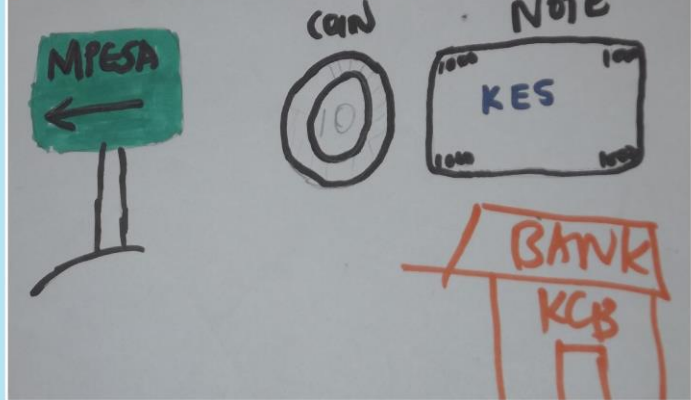
4. Ask the girls to name any locations they think are missing from the collection. Add the names of these locations to a sheet of paper and add to the group of locations.
5. Next, ask the girls to arrange the educational tools according to where they use them most to learn during after-school hours each day. Note how each girl organizes the tools with the locations. Have them discuss the arrangements they made.
6. Subsequently, ask the girls to rank the tools in order from the tool they use most to learn after-school each day, to the tool they use the least to learn after-school each day. Note how each girl organizes the tools. Have them discuss the arrangements they made.
7. Following that, ask the girls to rank the locations in order from being the easiest place for them to learn after-school, to the most difficult place for them to learn after-school. Note how each girl organizes the locations. Have them discuss the arrangements they made.
8. Then, ask the girls to rank the tools in order from being the most useful to them, to the least useful to them for education and learning during after-school hours each day. Note how each girl organizes the tools. Have them discuss the arrangements they made.
9. After that, ask the girls to rank the locations in order from being their favourite place to learn after-school, to their least favourite place for them to learn after-school each day. Note how each girl organizes the locations. Have them discuss the arrangements they made.
10. Finally, ask the girls which tool (they can only choose one) they would like to use more for learning after-school each day and why. Then ask them where (they can only choose one) they would like to learn more after-school each day and why?
11. Explore why or why not mobile phones are viewed as educational tools.

## APPENDIX K: Depictions of the 11 Resources<sup>38</sup> which Constitute Agency in Kleine's (2013) Choice Framework

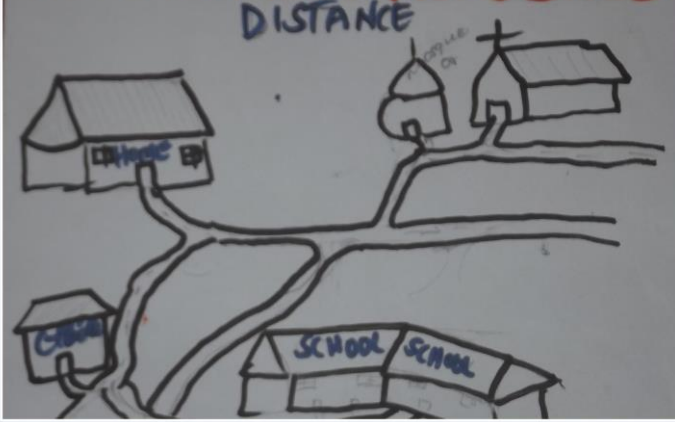


<sup>38</sup> Because the terms 'cultural capital' and 'social capital' were already in use in the research context, upon the advice of Angela and the teachers who reviewed and informed these drawings, I maintained the local reference to what the Choice Framework would term 'cultural resources' and 'social resources', respectively.

# FINANCIAL RESOURCES

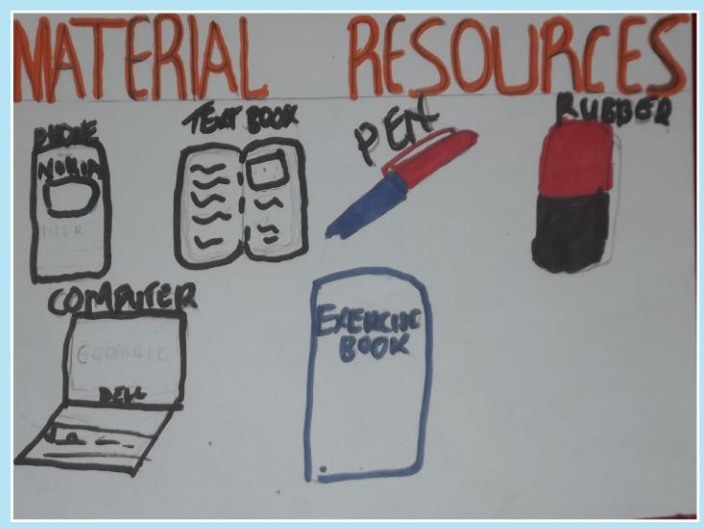
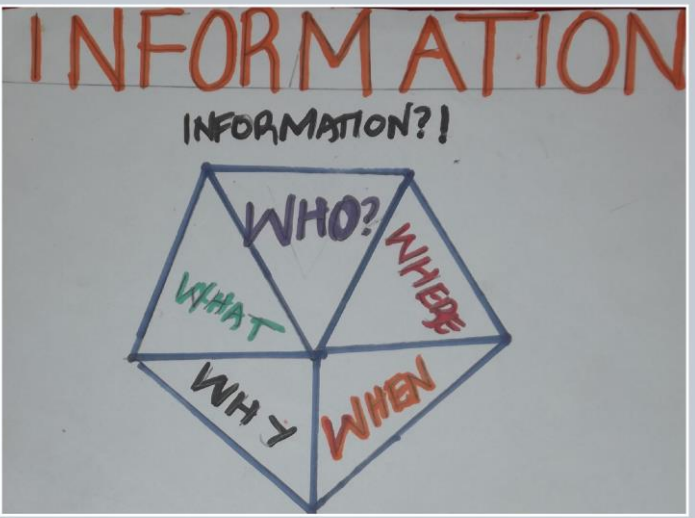


# GEOGRAPHICAL RESOURCES



# HEALTH RESOURCES





# PSYCHOLOGICAL RESOURCES



# SOCIAL CAPITAL



# TIME

A hand-drawn clock on the left shows the time as approximately 10:10. To the right is a grid for time management with columns for '10:00-11:00 AM', '11:00-12:00 PM', and '1:00-2:00 PM'. The grid contains the following text:

10:00-11:00 AM	11:00-12:00 PM	1:00-2:00 PM		
ENG	GO	BIO	B	
THE	NAT	PHI	HEA	R
MED	RAW	CRS	KIN	E
THE	CHA	PHI	EN	A
PHI	PHI	CON	PHI	K



## APPENDIX L: Rationale for the Selection of biNu and Worldreader as Mobile Technical Tools to IATECAS

In January 2014, the survey I administered helped me to discern both mobile phone ownership among the girls and the type of mobile phones owned. In February 2014, I asked the confirmed research participants to bring their mobile phones to school so that I could assess their functionality; their parents were called and letters were sent home to secure permission for their daughter's research participation; and I also cleared this action with the school leadership. Once this was done, I noted that most girls had basic phones (13), five had feature phones, and four had Android-based smartphones.

Next, I performed a landscape review of every mobile learning tool I could find available in Kenya at the time of the study. The result of this search can be found below in **Table L**.

**Table L: Matrix of mobile learning tools available in Kenya in 2013**

Tool (below) Features (right)	Need Internet?	Hardware it works on?	Age group aimed at?	Underlying learning theory?	Topic aimed at?	Cost	Support peer learning or collaboration?	Equipped w/learning analytics?	Come with learning activities and resources?
1. Eneza Education	No for some but yes for other versions	Basic phones, smartphones and computers	Primary school	Behaviorism but also aspects are constructivist (competitive quizzes, ability to interact with teachers)	Exam prep across all subjects at the secondary level	Can be free to students if schools pay costs. Otherwise, it is 50 cents per SMS	Yes, via quizzes	Yes	"Spreading Stories," includes paper booklets of stories that students can take comprehension quizzes on via the mobile phone.
2. Materials from KICD	Uncertain	Basic phones, smartphones	Primary and secondary	Behaviorism	Content available across all subjects	Free at the moment	Unknown	Unknown	Yes, especially since it's tied to the national curriculum
3. MXit	Yes	Feature phones, smartphones, computers	All	None, but has constructivist possibilities	Not specifically learning-oriented, but Dr Math in South Africa has been used for that subject	Free	Yes, that's the very nature of the platform	No	No
4. Facebook Zero	Yes	Feature phones	All	None, but has constructivist possibilities	Not specifically learning-oriented	Free	Yes, that's the very nature of the platform	No	No
5. Wikipedia Zero	No for some but yes for other versions	Basic phones, feature phones, computers	All	Users can generate knowledge and rate knowledge others share.	Content available across all subjects	Free for the countries where zero-rated data agreements exist	Yes	No	No

Tool (below) Features (right)	Need Internet?	Hardware it works on?	Age group aimed at?	Underlying learning theory?	Topic aimed at?	Cost	Support peer learning or collaboration?	Equipped w/learning analytics?	Come with learning activities and resources?
6. <b>biNu</b>	Yes	Feature phones	All	None, but has constructivist possibilities	Content available across all subjects	Free, but must pay data charges. However, compression software helps reduce this cost	Yes it is possible but not inherent in the software itself	Yes	No
7. <b>Kytabu</b>	Yes	Tablets	All	Behaviorist	Content available across all subjects	80KES/week	No	No	No
8. <b>Worldreader</b>	Yes	Feature phones or eReaders	All	None, but has constructivist possibilities since users can create content	Content available across all subjects	Free, but must pay data charges. However, compression software helps reduce this cost	Yes it is possible but not inherent in the software itself	No, but if agreement is made with the company, I could get access for my users	No
9. <b>Ustad Mobile</b>	No	Feature phones and smartphones	All	Based on the design implemented, both behaviourist and constructivist practices are possible	Any that the user wants since they can choose the content that is populated	Free	Yes	Yes	Yes, these can be designed within the platform
10. <b>eLimu</b>	No	Tablets	Primary school	Both behaviourist and constructivist practices are possible	Content available across all subjects	Free at the moment	Yes	Unknown	Yes

The analysis of the search findings showed that most tools available were inappropriate for the following reasons: it was not available on the type of handsets common among the research population, the content was targeted to learners at the primary school level, or significant costs would be involved with using the tool. Additionally, for the materials from KICD, for secondary learners, at the time of the study the materials were designed to be easily accessible via the web but was not properly adapted for mobile screens. In the case of Kytabu, despite attempts to reach out to the founder of this tablet-based textbook rental service, I was unable to make contact. I later learned that Kytabu had not fully launched by the time of the study, as plans for implementing and offering the service had apparently stalled. Moreover, at a cost of 80 KES per week, it is unclear if this cost would have been sustainable over time given the socioeconomic backgrounds of the learners at NDSS. Likewise, Eneza Education was targeted solely at learners at the primary level, but at the time of the study, one SMS message cost about 0.50¢ if the learner's school did not cover the subscription fees for the service. While MXit and eLimu were both free services which facilitated mobile learning opportunities, the content on MXit was not always well-structured for the ease of navigating the offerings to support IATECAS and the content on eLimu was for primary grade learners and was also unavailable to schools who were not participating in pilot studies when this research was conducted. Finally, because Facebook Zero and Wikipedia Zero were only available if the person accessing the sites was a customer of a specific mobile network operator (Airtel Kenya or Orange Kenya at the time of this study), this meant that the girls

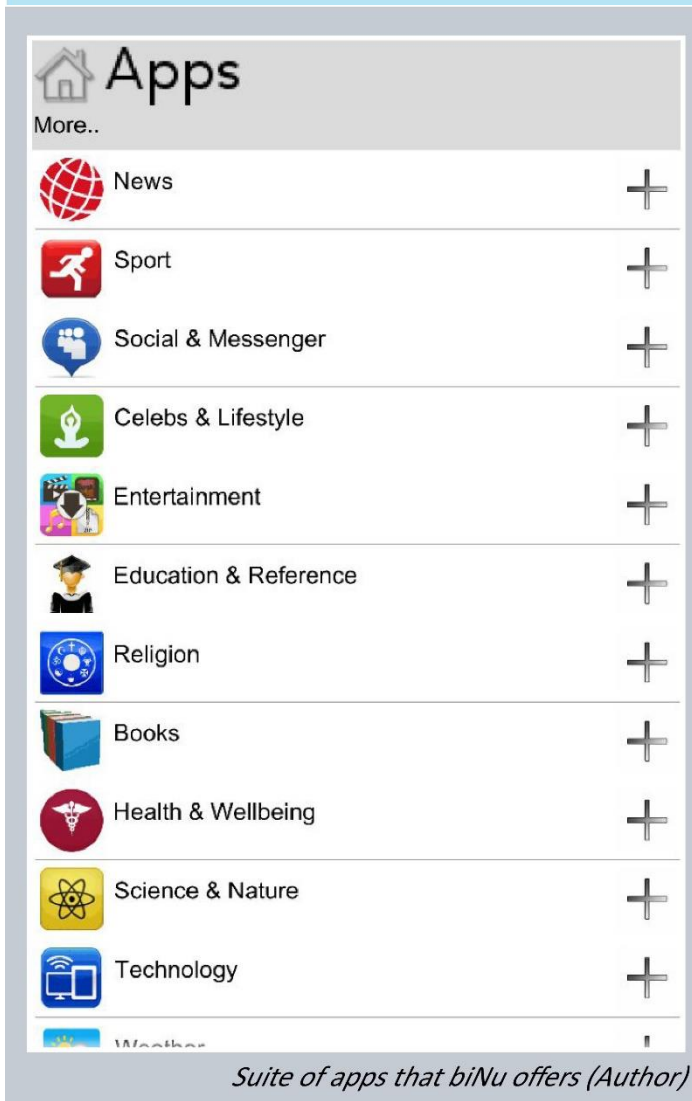
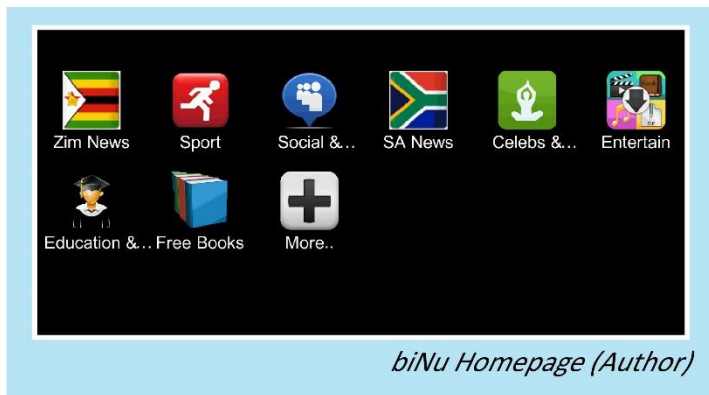
would need to have new SIM cards purchased for them in order to make use of these two apps. There was also the issue of the free services being made available only for a limited amount of time as a promotion, so there was no guarantee that the apps would be available for the duration of the study.

Given the above, this narrowed down the options to two possible mobile learning interventions: biNu/Worldreader or Ustad Mobile. In the end, I decided to use biNu/Worldreader because Ustad Mobile was still in its beta phase of development and might have had too many technical challenges to be used during the study. What follows is further information on why biNu/Worldreader was selected.

biNu and Worldreader were trialed as potential tools to help the NDSS learners realize their desired development outcome to have choice to increase their access to educational content after school because both apps were designed in a way that would respond to the criteria that were thought to be ideal for appropriation by the girl learners in this context. biNu is a free social networking and content aggregator app tailored for low-bandwidth contexts. biNu facilitates low-cost access to a curated suite of apps that might be used for learning including HIV360 (information on preventing HIV infections) and beSmart (content for revising secondary school subjects). Worldreader is a free app found within biNu when installed on feature phones, but is also available as a standalone app on Android smartphones. At the time of this study, Worldreader facilitated mobile-based access to a library of more than 6,000 books with formal, non-formal, and informal learning content.

While there is no specific underlying learning theory associated with biNu and Worldreader, the ways that learners might go about interacting with educational content after school through the apps is largely behavioristic in nature. By this I mean that the learning is unidirectional and the girls can only access and read the content but they cannot directly contribute to the construction of new knowledge built around the content found on the apps unless a facilitator designs activities which make this possible. Nonetheless, there are useful pedagogical affordance of the two apps: There is a chat function built into biNu messenger that could allow the learners to chat with each other in real-time while they are accessing the app. This could make it possible for the girls to discuss books they were reading, inquire about content taught at school if they had been absent, and even to ask for support from me or Angela if they were having difficulty searching for or accessing content they wanted to read after school. The chat functionality could therefore be a mechanism for promoting collaborative and constructivist learning opportunities. Screenshots of biNu and Worldreader can be found in **Appendix M**.

## APPENDIX M: Screenshots of the biNu and Worldreader apps



## Apps

### Education & Reference

- |   |                    |   |
|---|--------------------|---|
|  | Google             | + |
|  | Google Translate   | + |
|  | English Dictionary | + |
|  | beSmart            | + |
|  | hiv360             | + |
|  | American English   | + |

*Education & Reference apps within biNu (Author)*

## Apps

### Books

- |   |                      |   |
|---|----------------------|---|
|   | Worldreader          | + |
|  | Mills & Boon Romance | + |
|  | FunDza               | + |

*Free Books apps within biNu (Author)*

# Lawino

AN ELECTRONIC MAGAZINE  
STARTED BY WRITERS,  
TO PROMOTE  
WRITING FROM AFRICA



*Worldreader library categories (Author)*

## More Books

Classics (428)
Laugh (20)
Drama (164)
Horror (12)
Fan Fiction (4)
Other Fiction (117)
Other Non Fiction (52)
Stories from our users (71)

*Worldreader's additional book categories available (Author)*

## APPENDIX N: PLA Workshop Lessons Learned Activity

Lessons learned workshop plan to be carried out by research assistant Farah

<b>Date</b>	26 January 2015	<b>Location</b>	
<b>Time</b>	16.00-17.50	<b>Number of students present</b>	
<b>Resources</b>	33 sheets of paper, sticky notes, pens, pencils, mobile phone to record		

CONTENT / KEY LEARNING POINT	LEARNING ACTIVITIES	RESOURCES
<p><b>Introduction &amp; welcome</b></p> <ul style="list-style-type: none"> <li>• Waiting 10 min (sometimes they are late!)</li> <li>• Welcome 5 min</li> <li>• Introduction 5 min – Summarise why you are conducting workshop.</li> </ul> <p>Recognise and document lessons. Also, be sure to write down the names of the girls who attend</p>	<p>Have the girls share their favourite memories from the past year (even if not related to the research) whilst you wait for people to arrive.</p>	<ul style="list-style-type: none"> <li>- Sheet of paper to write attendance list</li> </ul>
<p><b>Build project timeline</b></p> <p>To remind the girls what the key tasks and activities are, you are going to build a timeline of activities from the project. They can then reflect upon the activities to help them identify the lessons.</p>	<p>Spread the months on the table to create the timeline from January to November.</p> <p>Invite participants to write key project phases &amp; activities on sticky notes and have them put these sticky notes on the sheet of paper of the month when the activity occurred</p> <p>Read out the key activities as they are placed on each month.</p> <p>Invite people to walk through timeline.</p>	<ul style="list-style-type: none"> <li>- 11 sheets of paper for timeline</li> <li>- Sticky notes</li> <li>- Pens/pencils</li> </ul>
<p><b>What can be improved?</b></p> <p>Reflecting on all the project activities and the project as a whole, please ask the girls the following questions:</p> <ul style="list-style-type: none"> <li>• Why do you think Ronda</li> </ul>	<p>Document the responses when you ask the questions and use sticky notes to place their responses on the timeline.</p>	

<p>invited you to participate in this research project?</p> <ul style="list-style-type: none"> <li>• What would you say was the overall goal of this research project? What was the main thing to be achieved?</li> <li>• What challenges made it difficult to participate in the project?</li> <li>• What was the most frustrating thing about participating in the project?</li> <li>• Based on what you know now, what could have been improved about the project?</li> <li>• What do you think should be done differently next time?</li> </ul>	<p>If short of time, have the girls write up their own feedback on the sticky notes and have them stick them on the timeline. However, try not to do this because there is a risk that they won't document it with enough detail</p>	<ul style="list-style-type: none"> <li>- Timeline</li> <li>- Sticky notes</li> <li>- Pens/pencils</li> </ul>
<p><b>What worked well?</b> As above, ask the girls to reflect on the project activities and project as a whole and have them answer the following questions:</p> <ul style="list-style-type: none"> <li>• What did the research project do well (what should Ronda or biNu do more of)?</li> <li>• What are the top significant project successes?</li> <li>• What did you like most about the research project?</li> <li>• What was the most important lesson you learnt during the research project?</li> <li>• Was there anything about this project that you really valued? What did you value and why?</li> </ul>	<p>Document the responses when you ask the questions and use sticky notes to place their responses on the timeline.</p> <p>If short of time, have the girls write up their own feedback on the sticky notes and have them stick them on the timeline. However, try not to do this because there is a risk that they won't document it with enough detail</p>	<ul style="list-style-type: none"> <li>- Timeline</li> <li>- Sticky notes</li> <li>- Pens/pencils</li> </ul>
<p>Invite more feedback. This time, let the girls write their own (if</p>	<p>Invite participants to get up and add more sticky notes to</p>	



they haven't already).	<p>timeline of lessons or feedback.</p> <p>If no more feedback, read out some existing feedback and see if you need to get more info to identify the lesson and what would be done differently next time.</p>	<ul style="list-style-type: none"> <li>- Timeline</li> <li>- Sticky notes</li> <li>- Pens/pencils</li> </ul>
Where there any positive or negative unintended outcomes that were not anticipated?	Facilitator documents on sticky notes and pin up on timeline	<ul style="list-style-type: none"> <li>- Timeline</li> <li>- Sticky notes</li> <li>- Pens/pencils</li> </ul>
Privately share their lessons & feedback	<p>Hand out a sheet of paper to ALL participants.</p> <p>Everyone needs to write</p> <ol style="list-style-type: none"> <li>1. <b>How useful they think the session was?</b> They can choose ONLY ONE: Very Useful, useful, Neutral, Not useful, waste of time.</li> <li>2. <b>How enjoyable do they think the session was?</b> They can choose ONLY ONE: Very enjoyable, enjoyable, neutral, not enjoyable, terrible.</li> <li>3. <b>Other feedback &amp; lessons.</b> If the girls were too shy to share their lessons learnt, have them write them down but do not write their names – this can be done anonymously.</li> </ol>	<ul style="list-style-type: none"> <li>- 1 sheet of blank paper for each girl</li> <li>- Pens/pencils</li> </ul>
<p><b>Conclusion</b></p> <p>Thank participants</p>	Be sure to thank them for their patience, ask them if they have any questions, and if there is time, tell them what is happening the rest of the week for the final research activities	

## APPENDIX O: PLA Workshop Represent Yourself & Mini-Interviews Activity

Represent Yourself! & Mini-Interviews plan to be carried out by research assistant Farah

<b>Date</b>	28 January 2015	<b>Location</b>	
<b>Time</b>	16.00-17.40	<b>Number of students present</b>	
<b>Resources</b>	This sheet of paper, notebook to take notes, pen or pencil to take notes; girls won't need anything for this. Record if possible with your mobile phone.		

CONTENT / KEY LEARNING POINT	LEARNING ACTIVITIES
<p><b>Introduction &amp; welcome</b></p> <ul style="list-style-type: none"> <li>• Waiting 10 min (sometimes they are late!). While waiting, do the learning activity to the right →</li> <li>• Welcome 2 min</li> <li>• Introduction 3 min – Summarise what you will do this afternoon, which is to present the research findings to see if the girls agree with them, disagree, and what might be changed.</li> </ul> <p>Document their feedback. Also, be sure to write down the names of the girls who attend</p>	<p>Ask the girls what their education goals are for the year. What do they hope to achieve through learning this year? Please write down their responses.</p>
<p><b>Represent Yourself!</b></p> <p>Here, explain that based on the data that I gathered from: the interviews, the card game, the surveys, the focus groups, as well as their mobile learning app usage, these are the most important things that I learned from this research. You must ask the girls if they agree with these findings? If yes, why and if no, why not and what would they say the real findings are? They can change ANYTHING they want!</p>	<p><b>Here are the findings I would like for you to present to the girls and get their opinions on:</b></p> <ol style="list-style-type: none"> <li>1. Access to more books and educational/educative materials was the thing the girls wanted most for their education before they received the introduction to biNu and the mobile phone.</li> <li>2. A lack of time was the biggest challenge to using biNu. They did not have much time after school for studying with biNu or informal learning with biNu.</li> <li>3. Their parents or guardians were the most important influence as to whether they could use their mobile phone and biNu for</li> </ol>

	<p>formal or informal learning.</p> <ol style="list-style-type: none"><li>4. Other barriers to using biNu for learning included the lack of money to buy mobile phone credit, inability to charge the phone, phone was stolen or lost, forgot the login to biNu, parents took away the phone. However, these challenges were not as difficult to using biNu as the lack of time was. <b>Farah, please note how many girls agree to each reason.</b></li><li>5. Before the girls were introduced to biNu, some did not believe that they could use the phone to learn.</li><li>6. After the girls were introduced to biNu, some of them changed their opinion and now believe they can use the mobile phone to learn.</li><li>7. Initial use of biNu was very high. However, once the 10 KES credit that Ronda provided ran out, it was more difficult for the girls to access the app consistently.</li><li>8. Being able to communicate with Ronda on the app was a helpful and fun thing that the girls liked to do.</li><li>9. The girls generally believe that biNu helped them meet their wish of having more access to books after school.</li><li>10. There seems to be more restrictions on how and when the girls can use their mobile phones, especially when compared to the boys in their families.</li><li>11. By the end of the research</li></ol>
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	<p>project, the girls believe that biNu should have been introduced to more students.</p> <p>12. The girls still believe that traditional paper textbooks are better for learning than using the mobile phone. However, they still think the mobile phone is a useful tool for learning.</p> <p><b>Farah: these are the main findings that I have. Do they have any other findings they think should be included? What should be changed about the findings I shared, if anything? How can I better represent their voices and their experiences?</b></p>
<p><b>Mini-Interviews</b></p> <p>If there is time, I would like you to ask the girls these questions separately and one-by-one. Also, if you think that there are any questions that they should be asked that I have not included, please feel free to ask them!</p>	<ol style="list-style-type: none"> <li>1. Even if you do not use your mobile phone for the entire length of your home study periods, do you at least use it occasionally for learning?</li> <li>2. Do you ever use the biNu app for additional study on your way to school or on your way home from school while you are traveling?</li> <li>3. How has the experience of using biNu changed since the research began? Do you still use the app to do the same things?</li> <li>4. Did you ever allow your siblings, relatives or friends use your mobile to access biNu and the study resources?</li> <li>5. Do you think you would be able to do your studies with your phone alone? Do you ever think you could stop using your textbook and just use biNu only? Why or why not?</li> <li>6. Have you experienced any negative consequences of using</li> </ol>

	<p>your phone for study?</p> <ol style="list-style-type: none"> <li>7. Do you feel that you do more, less or the same amount of study using textbooks for help since you were introduced to biNu?</li> <li>8. What things do people say about mobile phones that make you think that they don't want girls to use them, even if it can help them learn?</li> <li>9. If given the opportunity to participate again in a research project like this, would they accept? Please tell why or why not.</li> <li>10. Do you believe that biNu helped you to reach your educational goals last year? Why or why not?</li> </ol>
<p><b>Conclusion</b> Thank participants</p>	<p>Be sure to thank them for their patience, ask them if they have any questions; if there is time, tell them what is happening tomorrow for final research activity</p>

## APPENDIX P: PLA Workshop Letter Writing to biNu and Worldreader Creators Activity

Letter Writing to biNu and Worldreader Creators plan to be carried out by research assistant Farah

<b>Date</b>	30 January 2015	<b>Location</b>	
<b>Time</b>	15.30-16.50	<b>Number of students present</b>	
<b>Resources</b>	This sheet of paper, notebook to take notes, pen or pencil to take notes, one sheet of paper for every girl to write, pens and/or pencils for the girls.		

CONTENT / KEY LEARNING POINT	LEARNING ACTIVITIES
<p><b>Introduction &amp; welcome</b></p> <ul style="list-style-type: none"> <li>• Waiting 10 min (sometimes they are late!). While waiting, do the learning activity to the right →</li> <li>• Welcome 2 min</li> <li>• Introduction 3 min – Summarize what you will do this afternoon, which is to provide the girls with an opportunity to help make meaningful changes to the app based on their experiences.</li> </ul> <p>Document their feedback. Also, be sure to write down the names of the girls who attend</p>	<p>Ask the girls to tell you their favorite parts of the app. Why do they like these things? Ask the girls to tell you what they don't like about the app. Why don't they like these things?</p>
<p><b>Letter Writing to biNu and Worldreader Creators</b></p> <p>Here, explain that the girls are going to write a letter to the people who made biNu and Worldreader. It is another opportunity to have their voices heard. They should have their name signed at the bottom, the date at the top, and "Dear biNu and Worldreader creators," to start the letter.</p>	<p><b>Share with the girls the following:</b></p> <p>Today as the final activity you will write a letter to the biNu and Worldreader creators. What would you say to them? You will now write a letter to them!</p> <p>What do you think of biNu? How has being introduced to this app affected your life? What could be improved about the app? What, if anything, has this app done for you? What does this app mean to you? What did you like about the app? What didn't you like about the app? Tell us everything we can do to make biNu and Worldreader better for you.</p>
<p><b>Conclusion</b></p> <p>Thank participants</p>	<p>Be sure to thank them for their patience, ask them if they have any questions; if there is time, tell them what is happening tomorrow for final research activity</p>

## APPENDIX Q: Thematic Coding Examples for Data Analysis with the Choice Framework

Code	Brief Description	Example	Data Source of Example
<b>Time</b>	Someone makes reference to their schedule; or lack of time; or abundance of time; or activity duration; or time increments (hour, minute, second, etc.).	"Because I don't use the phone too much, maybe I can use it once a week or every two weeks..."	Focus group discussion
<b>Informal norm - space</b>	Someone makes reference to any spoken or unspoken rule related to their expected behavior when in a particular location (i.e. home, school church, etc.	Research participant is observed on more than one occasion ceasing all use of any electronic devices if her father is present at home	In-home observation
<b>Informal norm - time</b>	Someone makes reference to any spoken or unspoken rule related to the duration of activities they engage in or when during the day they may engage in certain activities	"...Because my parents may think that the time on my phone is when I should be reading."	Focus group discussion
<b>Sense of choice</b>	Someone expresses that they are aware of things they can or cannot do with their mobile phone (w/distinctions made to highlight the research phase when this expression occurred)	All girls indicate that they know they can read books on their mobile phones and that they know how to do so unassisted	Survey
<b>Use of choice</b>	Someone expresses that they use their mobile phone for accessing books or for learning; or someone is observed accessing books or educational apps on their mobile phone for learning; or someone says they do not use their mobile phone for accessing books or learning; or someone is not observed accessing books or educational apps on their mobile phone for learning despite having that option available to them and being aware of it and having the means to use it with no apparent restrictions	Research participant was observed more than once using her mobile phone at home to read or access educational materials and data from her mobile learning app usage corroborated her use, including on days when in-home observations were not performed	In-home observation; mobile learning app analytics;

Code	Brief Description	Example	Data Source of Example
<b>Educational resources</b>	Someone makes reference to their educational (in)experience or their (un)skills	"Education resources don't affect because this is what I am going to school for." Research participant	Card game discussion
<b>Affordability of ICTs (mobile phone credit)</b>	Someone expresses that their mobile phone and its use are affordable; or that their mobile phone and its use are not affordable; or discusses finances related to their mobile phone	"Atleast it is easier and cheap to use by the way it is fun." - Research participant	Mobile learning app message received
<b>Financial resources</b>	Someone makes reference to money or the economic capital available to them; these references include school fees, transportation fares and references to household income	"Sometimes school fees is delayed by my parents and I miss school. The longest I have missed school is one week."	Card game discussion
<b>Geographical resources</b>	Someone makes reference to a location and its intangible qualities such as the level of noise in the location, the distance, areas of interest that are far away from or in close proximity to this location, etc. Principal locations of consideration are home and school	"Another problem is that we live in a single room, so the room is kind of small. Then now we want to sleep all of us, can't stay up reading with the electricity. My brothers complaining, they hate it so much, my aunties are complaining because of the electricity, so now sometimes i am forced to switch off the electricity, and yeah because of the heat."	Focus group discussion
<b>Psychological resources</b>	Someone makes reference to an intangible or not-easily-observed state of being such as happiness, depression, confidence, etc.	"My after school learning, maybe I need some motivation,... [...] so i need someone who is encouraging me, read, read, read, someone who can even wake me up in the morning very early and read. Because now i am alone, i don't even have any motivation, maybe someone who can set the alarm for me, just wake me up, encourage me."	Focus group discussion

## **APPENDIX R: Transcripts of Letter Excerpts NDSS Learners**

### **Wrote to the Creators of biNu and Worldreader, Aspect:**

### **Ability to IATECAS**

#### **Elaine's Letter<sup>39</sup>**

biNu has helped us a lot since last year when Ronda introduced it to us. I was able to read short stories, play games, and do my homework with biNu. I think biNu should be introduced to other students out there so that it can help them the way it has helped us.

biNu has changed my life. Before, I used my phone only for chatting and calling, but since I was introduced to biNu, I am not only chatting and calling, but even learning and making friends through biNu, downloading songs, downloading games and even reading a Bible.

Sometimes when you are learning you have a question you can't find the answer to in a textbook, but when you Google through biNu you find your answers in detail. biNu has helped me not buy more textbooks for learning.

#### **Faith's Letter**

biNu is a good educational app that is helpful to us as students. It is so learnable and enjoyable in terms of studies, with the inspirational novels that give us words of encouragement, wapricks, messages that enable us to communicate with other people worldwide who have access to the app. With biNu, I was able to access new vocabulary that improved my grammar, more educational books than are in our school syllabus. I enjoy the biNu app.

#### **Mercy's Letter**

The app has given me or has provided many applications in which I can look up many revision questions, and which has made me improve in chemistry, especially on the topic of moles – it explained broadly and gave many examples of calculating moles and molarity concepts.

The biNu app means a lot to me, because I can now interact with other friends from outside, send free messages without worrying that my credit will end, and get inspirational quotes that have greatly influenced me both academically and spiritually. The biNu app is a way for a person or student to revise without using a textbook, and so that's why biNu means a lot to me...

#### **Susan's Letter**

The biNu app has really helped me a lot, especially when I am doing my studies back at home. I even use the app for calculating mathematics, since I don't have a calculator. I was able to understand more on the topic of reproduction in plants, because it explained it better than the

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<sup>39</sup> Because the original texts were included in the thesis, these transcriptions have corrected the grammar utilized in the letters.



textbooks we use at school. I even improved my grade in Biology because of that. I was even able to find new words in the dictionary using the biNu app, and understand them more. I was able to know even the things that go on in the whole entire world because of reading the news in the app.

The biNu app really means a lot in my life, because if not for those books that I had on the app, I don't know where I would be right now. The app is very educative and I thank God for letting me be able to know the app.

**APPENDIX S: Kenya Secondary School Grading Scale (Clark, 2015)**

<b>Kenya Secondary School Grading Scale</b>
A
A-
B+
B
B-
C+
C
C-
D+
D
D-
E

# **APPENDIX T: Transcripts of Letter Excerpts NDSS Learners**

## **Wrote to the Creators of biNu and Worldreader, Aspect: Grades**

### **Ayesha's Letter<sup>40</sup>**

BiNu has changed my life because I have been able to improve my grades, not only in school but also at home because I used the app for educational reference. The biNu app has helped me have a positive attitude towards some subjects in school, because I used to believe that those subjects were very hard.

### **Damaris's Letter**

I would like to take this opportunity to thank you for the creation of biNu. I really enjoy using this application because it has really and completely changed my life from the moment I was introduced to this application. My grades have really improved from the time I was introduced to this application.

### **Lupita's Letter**

Especially in my studies, those weak subjects nowadays I am able to be strong on them because of the books there that always guide me on some things that aren't in textbooks. I am really appreciating you guys a lot, even if I don't know how to thank you so you can see I really mean it. If not for the apps that are in biNu, I don't even imagine if I could ever improve that much. Thanks once again.

### **Nancy's Letter**

The biNu app has helped me a lot in my grammar section. That made me to improve in my subjects and be able to the same kind of questions when it comes in the exams. Through biNu, I was also able to download songs.

### **Wangari's Letter**

Since I was introduced to biNu, I have been improving my grades and also changed my attitude towards other subjects. The app really helped me in knowing some recipes for cooking and the procedures to follow while cooking. So it has really changed my life because I did not know how to cook so many kinds of foods. It has changed my grades and my language. Reading stories from the app has really helped and have also improved on my weak subjects. This app means a lot.

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<sup>40</sup> Because the original texts were included in the thesis, these transcriptions have corrected the grammar utilized in the letters.

## APPENDIX U: Letter Excerpts NDSS Learners Wrote to the Creators of biNu and Worldreader with App Dislikes

What I didn't like about the app was that when sometimes I wanted to log in I was cautioned that "please try later the app is overloaded," To add to what I didn't like is there are some of the subjects which are not their all to mention, Chemistry, Kiswahili and history which I would like that they be put in biNu.

*Everlyne's criticisms of and requested improvements for biNu and Worldreader (Author)*

I might be chatting or reading stories all over sudden it hangs so I have to switch it off for sometimes then open and I loose alot when it hangs coz I can't continue studying I have to relart the story again.

The App some of the question are not renewed when one wants to ready other things or other topics you just do the same thing.

The App is good and it enjoys me because I can download songs and even new things like facebook e.t.c YOU should improve it for our sake to be to download things like

movies from video  
American bible  
Whatsapp  
Twitter

*Leanta's criticisms of and requested improvements for biNu and Worldreader (Author)*

you get lost somewhere you can just go to binu and find your way back home from wherever you are on the world. Also, you can add books like books that talks about sexuality because in most countries teenagers are mislead and end up ~~te~~ having children and HIV & AIDS at a very tender age. So if you do this it will really help alot. Thank you so much for listening to my views and thoughts may God ~~help~~ bless you.

*Marie's criticisms of and requested improvements for biNu and Worldreader (Author)*

What I didn't like about binu is that it takes long to load and at times when it is overloaded one cannot use it. At times it refuses to download some songs. When you use it for long it hangs and you can use it again after some hours.

To make binu better, I think you should introduce it as an application. To make it fast and increase ~~everything~~ <sup>application</sup> in binu. You should also renew surveys. You should also renew the quizzes.

*Zeituni's criticisms of and requested improvements for biNu and Worldreader (Author)*