

Travel without visas: teacher perception of a technology intervention in the Dadaab refugee camp

Thesis submitted for the degree of

Doctor of Education (Ed.D)

at the University of Leicester

by

Rebecca Telford Mansour, BA, MSc

Department of Education

University of Leicester

2018

Abstract

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Rebecca Telford Mansour

As the numbers of people who are forcibly displaced continues to grow, education for refugee children is in crisis. More than one third of refugee children globally are missing out on primary education and the safety and education of girls are disproportionately affected. Teachers are crucial to providing quality education for these children. By focusing on teachers in the refugee camp and their perception of technology-based learning, this study aims to contribute to the global body of practitioner and academic knowledge which will be required to meet the needs of the refugee crisis globally. Teacher perception of technology-based interventions aimed at improving the quality of learning and teaching for refugee populations were explored through a case study on Dadaab, a refugee camp on the Kenya-Somalia border. This study considers teacher engagement with the Instant Network Schools (INS) programme, an initiative between UNHCR and the Vodafone Foundation that aims to embed technology into formal schools in Dadaab.

Using the framework of Activity Theory, the research comprised bimonthly visits to Dadaab over 18 months and centred on 21 semi-structured interviews with teachers in INS schools supported by my own observation in schools and discussions with teachers and other stakeholders. This application of Activity Theory outside its historical domain is a potentially valuable contribution to knowledge and methodological innovation, responding to literature which questions the ability of Activity Theorists to engage outside of their own context, or with activity systems which are less linear. This study found that in-depth engagement with structural issues from the outset means that Activity Theory can be a valuable methodological tool in researching systems which include complex hierarchies of power.

Analysis of the data revealed the following broad themes: 1) teachers perceived significant benefits of the INS programme, in spite of challenges which slowed the set-up of hardware and connectivity; 2) the ability to bring the outside world to refugee children who are isolated within the camp was seen as the greatest benefit, allowing the children to 'travel without visas'; 3) there are many opportunities to develop the INS programme which centre on co-designing the training, curriculum and programme management with the teachers and schools involved; 4) many of the challenges to optimal use of the programme including impact on student learning outcomes relate to structural and macro-political issues which should also be considered in the programme design. Of these, the first was counter-intuitive and constitutes a novel finding, as teachers who had little or no access to the technology itself still reported the same levels of satisfaction with the intervention. This suggests that the technology has a symbolic value which is of significant importance to the teachers involved, and further understanding this value could improve our understanding of teacher priorities and how to better design meaningful interventions.

Acknowledgments

I undertook this study during a time when the refugee population of the world increased hugely, reaching 65 million people forcibly displaced by the summer of 2017. At the same time, the global discourse has created a world which is more threatening and less welcoming to those in need. In working with refugees, I remembered every day the Kenyan-Somali poet Warsan Shire's words:

...no one leaves home unless home chases you
fire under feet
hot blood in your belly
it's not something you ever thought of doing
until the blade burnt threats into
your neck
and even then you carried the anthem under
your breath...

My research spanned five years, and was inspired by the fifteen years before that spent working with children and their families in communities affected by conflict. My first thanks have to go to the communities and workers in Dadaab who provided generous and unfailing support to me in this study. To Cedric, Gurhan, Henok, Suleiman, Kent, Duke, Sammy, Jackie and the UNHCR and INS teams: thank you for your passion and dedication. To the teachers who spent time with me when they have so many demands on them already, and to the families who continue to fight for the education of their children: thank you. There is a Somali saying that you teach your mother to give birth: these are the people who moulded me as a researcher and as a human being.

Even contemplating this study would not have been possible without the love, patience and support of my two children, Mekhi and Mima, and my parents Ruth and Michael Axten. Thank you for the time you have given to me, the unfailing belief that I could get this far and the solid foundation I needed to take flight. Mekhi and Mima: I hope that someday you see that the generosity and time you gifted to mummy to 'write her book' meant something to us as a family, and to other children who hope for a better future. To my friends, family, and support networks, especially David and Daniel Norland, Kate Radford, Martin Emberton, Marcia Manning, Pippa Hamwee, Deirdre

Clancy, Marsha Jackson, Jennie Taylor, Chege Waitara, DestaNation and The Oxford Girls: a heartfelt thank you, and I hope I can return the favour.

Thank you to my supervisors: Palitha Edirisingha who has been by my side throughout, and Grainne Conole and Joan Woodhouse for their invaluable feedback. This research has been supported by a University of Leicester Studentship.

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Chapter 1: Introduction

1.1 Rationale: why this topic and this setting?

Children growing up in complex emergencies are at the sharp end of global development challenges: of the 58 million out of school children globally, 36% live in countries scarred by war and violence. More than one third of refugee children are missing out on primary education (UNICEF, 2015a) and the safety and education of girls is disproportionately affected (Jones and Naylor, 2014). The scale of problems facing children growing up in crises is vast, and growing. With just 3% of humanitarian spend going to education (Education Cannot Wait, 2017) there is unlikely to be the money, resources or commitment needed for a traditional response which can meet these needs. During the period of this study (2013-17), there was a global shift in refugee numbers. By the end of 2013 there were 51.2 million forcibly displaced people, including 16.7 million refugees worldwide (UNHCR, 2013). By mid-2017 those figures were 65.6m displaced, including 22.5m refugees (UNHCR, 2017): an increase of almost one-third in refugee numbers. The issues of refugee education and the responsibility of the international community to ensure that there are no 'lost generations' are at the forefront of global policy discourse: learning from previous and current refugee settings is substantially crucial.

Throughout my 15 years as an education practitioner, I have focused on working in conflict and protracted crises and on interventions which aim to find innovative ways to support children at the 'sharp end'. The personal inspiration to undertake this research work was in part a response to the lack of high quality evidence around solutions that could work in these contexts, and partly a tribute to the teachers I have met along the way. Both the literature review and my own experiences found that there was a lack of focus on teacher perceptions of new interventions in the development context generally and the refugee context in particular, where teachers may have significant additional needs. This study aims to contribute to the body of knowledge about refugee education, at a time when there is a global sense of urgency.

This sense of urgency has led to an increasing interest in the possibilities offered by technology as one solution to bridging the gap between the enormous needs and limited existing resources. Whilst there is a lack of robust evidence in this area, I hope

to build on a small body of practitioner-led work being built on ‘what works’, mostly developed through small scale studies around technology interventions in emergency contexts. The limited evidence that does exist shows that – within the context of good education practice including support to teachers, pedagogy and curricula – technology can offer alternatives in low infrastructure and low resource environments. These include new and cheaper ways to access classroom resources such as books; opportunities to train and support teachers; and efficient ways of managing education management information systems. Major donors are investing in programmes which design and test educational technology interventions for displaced children (Dahya, 2016), and organisations including the UN High Commission on Refugees (UNHCR) have small teams dedicated to innovations and ICT-based solutions in education. My own work has involved managing and implementing such initiatives, including the Instant Network Schools programme which establishes technology-enhanced classrooms in formal schools, and which is the focus of this research.

Whilst I began this journey with a view to finding and sharing best practice, I ended it with a much more nuanced interest in understanding how people, teachers in particular, engage with technology-based interventions. Through reflecting on this, my aim is that this research opens up the black box of what happens with teacher practices, perception and motivation when they are engaged with a new technology-based programme, and contributes to the professional challenges of designing with teachers in mind. I wanted to undertake this research in Dadaab in Kenya, previously the world’s largest refugee camp but now a forgotten outpost of both the political and humanitarian tragedy in Somalia and the global politics of negotiating responsibility for refugees. I started working in Dadaab in 2014 and have spent many weeks there as a researcher and practitioner in the four years of this study, undertaking nine field visits between 2014-16. In the same period, the international debates on accepting refugees and on terrorism significantly impacted on the Kenyan Government’s willingness to continue hosting such large numbers of displaced people in their country. In spite of this, parents are still desperate to send their children to school. I was fortunate to meet hundreds of refugee teachers who are paid very little, and still come every day to school to prepare and deliver lessons to classes of 120 children with very few resources. Where communities themselves remain so committed to education, even in the face of

complete uncertainty about their children's future, I felt that the very least I could do was to tell their stories.

1.2 Development of the Study

I began by designing and piloting a smaller scale study. This also focused on refugee camps but aimed to more broadly assess the impact of the Instant Network Schools (INS) programme on both teachers and students, reviewing changes to learning outcomes and to psychosocial wellbeing using a range of indicators. This also relied on the gathering of significant quantitative data, both from the education management information system (EMIS) in the camp which collected basic information such as enrolment, attendance and retention data; and through a system of surveys about the daily interactions with the INS in a classroom setting, designed to be completed by the teachers via the tablet computers and internet provided as part of the programme. The pilot showed challenges in the research design and in the collection and availability of secondary data. There main challenges were:

The politics of numbers: There are two key obstacles to the collection of reliable data here. Firstly is that the nature of the overstretched staff in both the schools and the support organisations mean that monitoring is often not considered an essential task. The majority of interview respondents talked about how busy they were, and field notes from almost every trip included a note on monitoring information which had not been collected or shared. Secondly was an issue raised anecdotally by key partners and participants: though my own research did not specifically collect evidence on this I include it here as part of the reflection on the challenges of reliable quantitative data. The data from schools are used to allocate resources including capitation grants (an amount of money per child for materials) and teacher numbers. Because of the population dynamics (see below) managing these numbers could be an easy way for school administration and supporting organisations to receive additional funding and there is therefore the potential for unreliable data.

The dynamics of the population: Refugee populations are necessarily on the move. The overall population of Dadaab fell by almost half during this time, due to a range of factors including political challenges with the host country, and a strong voluntary repatriation programme. Each of the data collection points were at a different time in

the school and community year, and the shifting populations may represent holiday or harvest time, or a period of insecurity in the camp where students stayed at home. The depth of detail I was able to generate about such factors was not sufficient to manage this quantitative data reliably, but is noted here as a contextual challenge.

These difficulties led to a significant revision in the design of this research study, narrowing the focus to a small window of teacher perception within the INS programme only in Dadaab, and relying on semi-structured interviews with teachers. I believe that the richness of their stories makes up for the limits of possible scope.



The outside of one of the Instant Network Schools in Dadaab. Photo: Becky Telford

1.3 Research Questions

This change in focus aligned this study to the overall research question: *What are the teacher perceptions of their engagement in the Instant Network Schools programme in Dadaab refugee camp?*

This was considered through the following subsidiary questions:

1. What do teachers perceive to be the benefits of their involvement in the programme on their teaching and learning?
2. What is the impact on teacher motivation?
3. What do teachers perceive as the benefits to students?
4. What do they perceive to be the constraints or barriers to their optimal use of the programme to support teaching and learning?
5. What are the development needs for optimal impact of the programme: (i) At the level of the individual teacher (ii) For professional development activities and opportunities, and (iii) For modifications to the programme design?

1.4 Project Description: The Instant Network Schools Programme

This study focuses on the Instant Network Schools (INS) programme, run by the Vodafone Foundation, for which I was the Education Co-ordinator between August 2014 and April 2016. This personal involvement in the programme has an ethical consideration which is considered later in this paper (pp106-111). The programme is managed through multiple partnerships, including with the United Nations High Commission for Refugees (UNHCR) who are responsible for the management of refugee camps, and smaller implementing partners, usually international non-governmental organisations (INGOs) who are responsible for managing schools and teachers in the camps.

The programme works in refugee camps in Kenya, Tanzania, South Sudan and Democratic Republic of Congo, embedding ICT into formal schools or community libraries through the provision of one technology-enabled 'Instant Classroom'. This is for use by all teachers who work in that school and aims to provide technology-based support to teachers regardless of their grade and subject. The focus is therefore on providing resources and tools which can benefit learning across the school, rather than 'teaching' ICT. The intention is to improve learning outcomes for students.

The specific technology designed for each Instant Classroom consists of:

- A laptop, projector and speakers; all for use by teachers when teaching a class;
- The laptop linked to an offline server running Rachel Pi ('Remote Area Community Hotspots for Education and Learning', which semi-curates and offers a range of open educational resources, available at

<http://rachel.worldpossible.org/>). The content includes videos from global content providers such as Khan Academy; text books from the USA and Africa; and a range of other materials;

- 25 Android Tablet Computers, for use by the students during the class, pre-loaded with a range of offline content including eBooks;
- Internet connectivity creating Wi-Fi for use on all the devices. The Internet is provided for free by Vodafone operating partners – in Kenya, this is provided by Safaricom. The partners involved develop the most appropriate solution depending on the area. In Dadaab this involved putting in WiMax connectivity into the sites with WiFi routers to supply the schools;
- Electricity from solar power generators;
- Furniture and secure cabinets within the Instant Classroom. The majority of schools have some resources such as text books but these are very limited. Teachers use blackboards, and students sit at long wooden benches, sharing desk space.

In addition, the programme trains teachers to integrate the technology into their classroom practice, and to support each other in finding and using new content. This is done through focused training of trainers (ToT) whereby teachers are selected by their school management and the organisation supporting the school in the camp to act as Coaches. Coaches provide peer support to other teachers in their own school, building their capacity and confidence to utilise the technology and integrate it into lessons.



Photos of the Instant Network Classrooms in use in Dadaab. Credit: Vodafone Foundation

1.5 A note on terminology

Many of the elements of this study have their own lexicon: refugees and protracted crisis; teaching and learning; and ICT. This section briefly establishes my own use of these terms.

Education in Emergencies

During the literature review, I found broad technical and semantic discussions around the use of each term. Firstly there was a focus on education in conflict, but this is a disputed term: whilst UNESCO publishes a list of conflict-affected countries in the education focused 'Global Monitoring Report' (annual), Save the Children (2010) both publish lists of 'conflict zones' and study education within these. The two lists are different, though Somalia is on both. Since 2011, the World Bank's 'Harmonized list of Fragile Situations' has been commonly used to map the countries which are scored against a range of development criteria (economics, infrastructure etc.) and humanitarian criteria (such as the presence of peacekeepers). Whilst the phrase 'education in emergencies' or EiE has been commonly used (Sinclair, 2007; Talbot, 2013; INEE, 2015) to include locations where natural disasters along with social, economic, political and military shocks have impacted communities, the rise in *protracted* crisis means that this is losing favour. Others refer to education in 'fragile states' (Winthrop and Matsui, 2013; Kirk, 2007).

Overall, I agree with the global umbrella group INEE (International Network for Education in Emergencies) that it is important to note where these conditions exist because:

Conditions linked to conflict and fragility – including poor governance, violence, repression, corruption, inequality and exclusion – may affect accessibility, quality, relevance, equity and management of education provision in ways which can exacerbate economic, social or political instability. (INEE, 2012, p.5)

More recently, this term has been expanded to 'education in emergencies and protracted crisis', which reflects the protracted and cyclical nature of conflict, natural disasters, lack of resources and economic shocks. ODI (2015) recommends using the whole phrase or the simplified 'education in crises', and I follow this position unless

including specific terminology as used in the literature discussed. This attempts to encompass the multifaceted and dynamic environment in which so many of the world's children live, including refugee children who may be affected by crisis whilst living in 'safe' host country.

Technology in Education

Technology in education is a dynamic subject, and as such a number of different terminologies are used. This includes ICT4E (Information Communication Technology for Education); educational technology; and, technology-enhanced education. This study uses 'education technology', within which I include 'traditional' technologies such as radio along with more recent internet-enabled devices. In the literature review I have paid particular attention to interventions which are similar to the tablet computers used in the researched Instant Network Schools project. I also included a range of work which explored 'online and distance education' (such as Morpeth et al, 2009; Perraton, 2000; Nicholson, 2006; Baxter and Bethke, 2006). Whilst this was useful for understanding the broad applications of technology, the major focus is on students outside of schools and on the use of software and digital content rather than a blended approach, and was not comparable.

Low and lower-middle income countries

Throughout this thesis I use the phrase 'low and lower-middle income countries' to group together low-resource countries as defined by World Bank income statistics (World Bank, 2017). This includes Kenya, where the study is situated, and Somalia where the majority of respondents came from. I also include research about refugee camps, which do not easily fit into a global categorisation. Whilst the camps themselves house significantly disadvantaged populations in resource-poor and vulnerable environments, their location or the populations' country of origin may not be 'low income'. A stark example of this could be camps for Syrian refugees in Greece. Where I discuss findings or concepts which only relate to refugee camps, I explicitly say so.



Figure 1: A map of Dadaab refugee camp. Taken from Sesnan et al. (2013, p.39)

This study is a case study on Dadaab refugee camp, which is on the border between Kenya and Somalia. This section presents the research context, using both field notes and literature to prepare the foundation for the study. There is such a dearth of literature on Dadaab in general and education therein specifically, that the contextual information also constitutes a contribution to the body of academic research.

This study began in 2014, the year when Dadaab lost the title of ‘the largest refugee camp in the world’. At the time of writing in December 2017 the population had halved to 238,152 people (UNHCR, 2017c). Throughout the 27 years of existence, Dadaab has been home to a majority of Somalis (Nyabola, 2015). The camps are managed by the UN Refugee Agency (UNHCR), with permissions, regulations and support from the

Government of Kenya. 2016 saw the 25th anniversary of Dadaab, a timeline that means there are now children finishing secondary school who were born and have spent all their lives in the camp. There are also teachers who were born and completed their education there. The context of Dadaab is that of protracted crisis, a temporary solution accidentally made permanent. Many of the planned solutions such as infrastructure and the number and location of schools were designed for the original proposed 90,000 inhabitants and are no longer fit for purpose:

25 years after it opened, Dadaab is clearly no longer temporary and is yet another testament to the inability of international organisations to address protracted conflict situations. Three generations of refugees live in the camp, including many young people who have never called anywhere else home. The camp is large – if it were recognised as a city it would be the third largest in Kenya. (Nyabola, 2015, p.74)

More than 95% of the population of Dadaab are Somali. The size of population, and the preponderance of Somali culture reflected in the life of Dadaab, means that I focused on this refugee population in this study. I also engaged with the Kenyan host community through the presence of Kenyan national teachers in the camp. The relationship between the Somalia and Kenya as neighbouring countries has long been a challenge, and the border where Dadaab is situated has traditionally been insecure. It can be a challenging place to work in development and humanitarian response, as ‘the presence of armed bandits and Islamist militias such as Al-Shabaab, as well as periodic outbreaks of clan feuding, means that the threat of violence against humanitarian workers is very real’ (McSweeney, 2012 ¶13). There is a long history of refugee movement from Somalia into neighbouring Kenya, Ethiopia and Yemen, reflecting a much older history of pastoralist movement across national borders in the region. Major population movements have a distinct shape and reflect changing political and natural shocks in Somalia’s history (Hammond, 2014: Lindley, 2011: Long, 2011: Devictor, 2016) shown in detail in Figure 2, below which presents movements of all Somali refugees based on UNHCR data (adapted from Devictor, 2016):

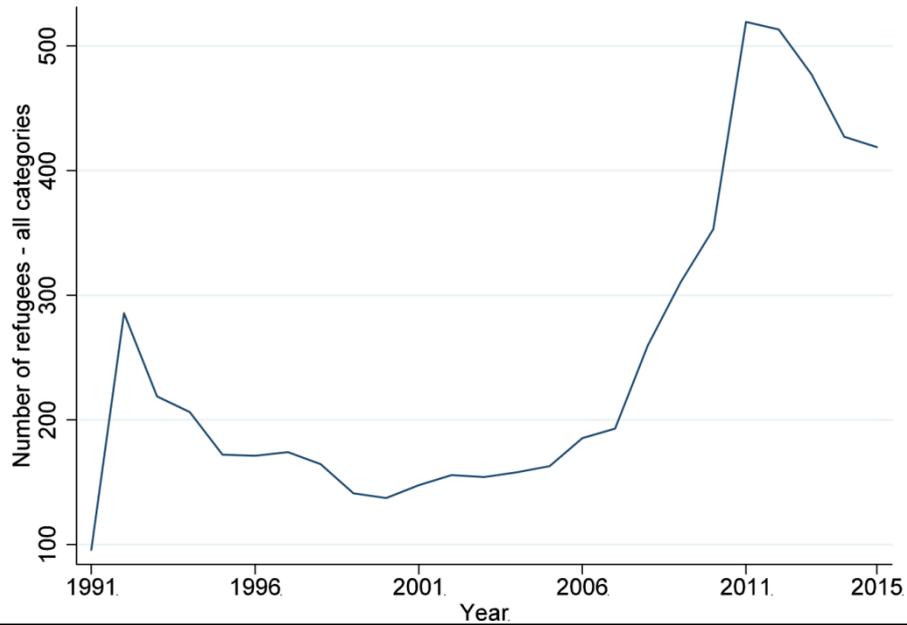


Fig 2: a timeline of Somali refugees between 1991-2015 (Devictor, 2016)

The first major flow of people was a response to the collapse of the Somali state in 1991 following the removal of the authoritarian dictator Siad Barre, when the country spiralled into factional violence and the creation of strongholds managed by warlords. The years between 1996-2005 were a period of relative stability, though 2006 was characterised by waves of famine, chronic food shortages and the disintegration of pastoralist livelihoods. These were accompanied by increased violent conflict and the rise of the militia group al-Shabaab, leading to significant displacement. More than 300 million refugees left Somalia between 2006-2011. In Dadaab, therefore, there are third-generation Somali refugees living with family members who left decades before, alongside relatively recent arrivals. The border with Somalia remains porous, and families may move back and forth depending on the stability of the situation (Hammond, 2014: Lindley, 2011: Long, 2011: Devictor, 2016). It is crucial to understand the complexity of the Somali population in Dadaab in order to understand the development of activity systems in the camp, and the challenges and opportunities that these present to education work.

Since 2014, numbers have been decreasing. This is due to two inter-related factors. Firstly, an upsurge in the negative attitude from the Kenyan government around hosting refugee populations in general, and displaced Somali populations in particular, which led to a lack of confidence in the future of the camp. During the time

of data collection, the Government of Kenya threatened to close down the camp twice, including a formal announcement in May 2016 that because of ‘...national security interests, [the government] has decided that hosting of refugees has to come to an end’ and promoted the closure of Dadaab ‘within the shortest time possible’ (Government of Kenya, 2016, p.1-2). Secondly, and partly in response to this, a tripartite agreement signed in 2013 between the governments of Kenya and Somalia and UNHCR (UNHCR, 2016) means that UNHCR has been implementing a campaign to support voluntary returns to Somalia. This repatriation campaign was stepped up in 2016 following pressure from the Kenyan government. During the period of this research study, the Somali population of Dadaab reduced from 391,207 in January 2014, to 238,152 in December 2017 (UNHCR, 2017c). The percentage of children under 18 has remained relatively stable at around 50%.

[Tensions and the policy context of the Kenyan Government](#)

Since 2013, Kenyan Government responses have been characterized by the desire for quick solutions to the protracted crisis. The first response was to remove refugees from urban settings and force them into camps where they could be monitored and kept separate from the host Kenyan population. The second, the threatened closure of Dadaab and forcible return of all Somali refugees across the border, has been playing out since 2012 and the dynamics continued during the lifetime of this research. During these negotiations, the refugee population has been forced to wait for information. Their food rations were cut in half and the rates of child malnutrition rose (UN, 2016). This uncertainty falls on people who are already displaced, and have fled from the violence of previous regimes and the militant group al-Shabaab, or from famine and the destruction of their livelihoods. It has had a significant impact on camp populations’ trust in the support they receive, which has also contributed to the numbers returning to Somalia – a country hundreds of thousands of such refugees have never even visited – as many feel they have no choice (Human Rights Watch, 2016). This tension between the nation state and the ‘stateless’ refugee population has a significant impact on every aspect of the lives of Somali refugee populations in Dadaab, including how the design and implementation of policies which frame the provision of education.

The tensions between the policies of the Government of Kenya and refugees' planned and perceived futures are a particular challenge. Whilst the Kenyan government permits its existence it simultaneously denies it through refusal to include it on any official maps of Kenya (Rawlence, 2016). There is permission to use the national curriculum and examination structures of Kenya – indeed it is the only option for students who wish to sit accredited exams – but rules on employment and restricted opportunities to tertiary education, travel and schooling outside the camp place restrictions on refugees lead to an uncertain future (Hyndman and Nylund 1998). At the same time as there is a focus on repatriation of the population to Somalia, Kenyan qualifications are not recognised there and school is largely taught in Somali rather than English or Kiswahili which is the medium of instruction for the children in camp schools (Mackinnon, 2014) raising questions about whether the education provided in Dadaab is fit for purpose. The Kenyan Ministry of Education established minimum standards for schooling in the camps in line with the rest of the country, including a maximum class size of 45; a teacher ratio of 1:45; and access to basic learning materials and hygiene facilities such as water and toilets (Umbima, Koelbel and Hassan 2010). However, there are neither the resources nor the monitoring capacity to ensure that these are implemented. These dichotomies make this a challenging context in which to explore constructs: of people, communities, and agency. All these aspects are central to this study.

Schools and Teachers in Dadaab

Making up more than 50% of the camp population, there are around 133,365 children and youth under the age of 18 in Dadaab (UNHCR, 2017c). Figure 3 (below, p. 25) shows the numbers of children and related school enrolment and attendance:

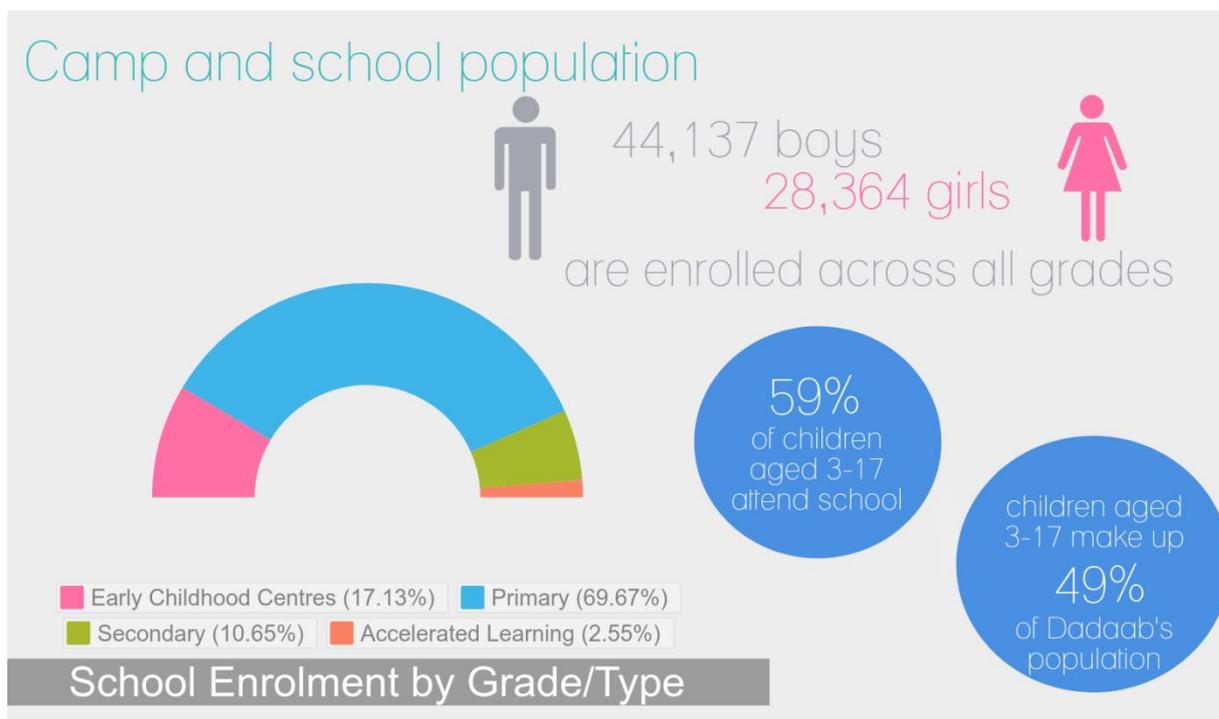


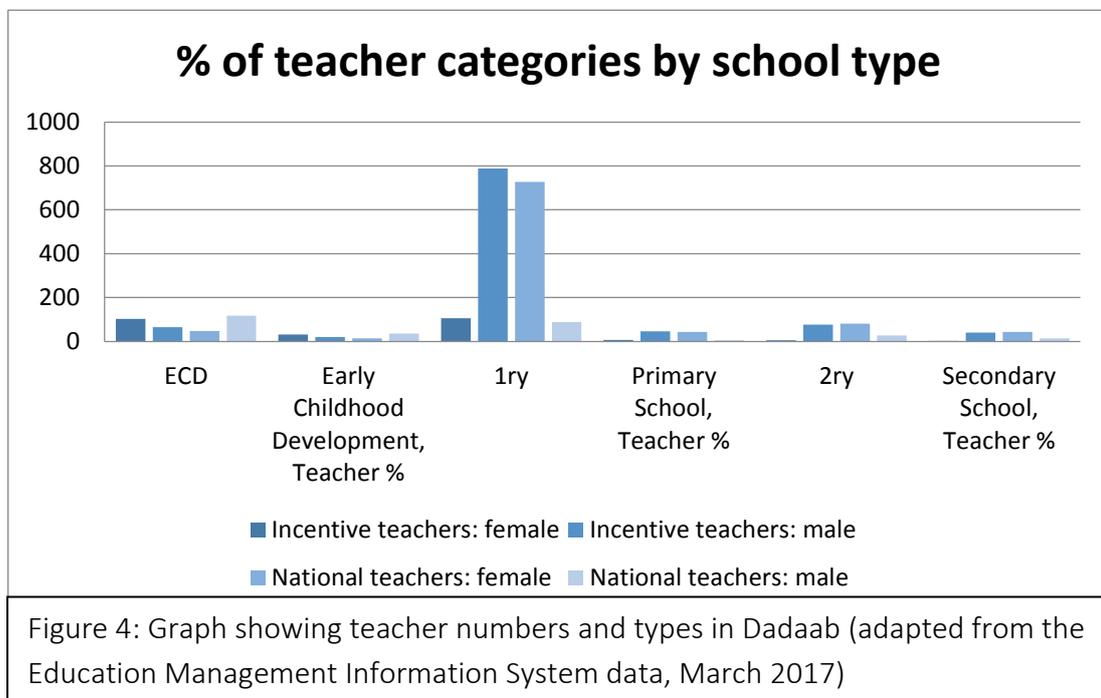
Figure 3: Infographic showing camp and school populations (adapted from the Education Management Information System data, March 2017)

The Instant Network Schools internal 2015 Annual Report claimed that ‘over 419 teachers and 18,013 pupils [were] enrolled in Instant Network Classrooms’ across 13 institutions [primary and secondary schools plus vocational centres]’. 84,680 school-aged children are enrolled in early childhood, primary and secondary settings (UNHCR, 2015), meaning that around 21% of children are involved in the programme. This research was conducted in six of those: four primary schools and two secondary schools which together serve a total of 13,731 students, or more than 75% of the students across the INS programme.

Whilst UNHCR is responsible for the camp overall and for navigating the wider policy framework with the host Government, schools are run and managed by non-governmental organisations (NGOs) who act as implementing partners. UNHCR awards certain permissions and contracts to NGOs: during the time of this study, three implementing partners in Dadaab managed primary schools (CARE International, Islamic Relief Kenya, and Lutheran World Federation) and one, Windle Trust Kenya, managed all secondary schools. These partners are responsible for recruiting, training and managing teachers; liaising with UNHCR and others to access curriculum materials and

organise exams. They also work with the UN body UNICEF, who are responsible for education management information data and provide technical support.

The Government of Kenya and UNHCR are responsible for agreeing the context of teacher hiring, management and professional development. In each school, Kenyan national teachers who have been formally trained and are nationally accredited, provide support to refugee teachers known as ‘incentive teachers’ because they are paid an allowance, or incentive, rather than a full wage. This is related to the permissions for refugees in earning money and is common across most refugee settings (UNHCR, 2012). Figure 4 (below) shows the types of teachers in Dadaab by school type:



Amongst the incentive teachers there are two main groups – those who were teachers before they became refugees, and those who became teachers once they already had refugee status and were in the host country. Teachers are often seen as highly skilled and are sought after for other incentive positions such as co-ordination work in the camps (Pennells and Ezeomah, 2000). Those who arrive as qualified teachers may find that there are disincentives to working in refugee camp schools: low remuneration, usually a stipend for incentive staff of all kinds; lack of recognition of home-country qualifications; discrimination; issues around contracting and job security, and other administrative difficulties (Reid, 2006; Penson and Yonemura, 2012). In

Kenyan camps, incentive teachers are paid on the same scale regardless of whether they were trained and experienced before becoming a refugee. An incentive teacher in Dadaab will be paid between \$50-75 per month compared to a Kenyan national teacher who will earn \$375-500 per month, though this creates challenges in teacher recruitment and retention, where, 'poor incentives and the lack of resources to deploy trained teachers contribute to low recruitment of qualified personnel' (UNHCR, 2012, p.46). The other group are what Kirk and Winthrop (2007) term 'spontaneous teachers'; those who took up teaching once they had moved as refugees. Sinclair (2002) notes that there are a range of challenges in training refugee teachers in-situ, and that whilst there is a wealth of experience in this area (such as the Windle Trust Kenya, Jesuit Refugee Service, and Norwegian Refugee Council as implementing partners in Dadaab), little of this is documented or shared.

There is a significant challenge with class sizes in primary school, where there is an average pupil:teacher ratio of 1:87, more than double the national average or the recommended minimum standard. Secondary schools in Dadaab have a higher percentage of Kenyan national teachers, and a smaller number of students due to the high dropout rates. The teacher numbers are partly in line with the more robust requirements of the Kenyan National Examination Council for students preparing for the Kenya Certificate of Secondary Education (KCSE, the end of secondary exam), and partly due to the small number of refugees who have completed secondary school themselves. All secondary schools are managed by Windle Trust Kenya, who suffered from two major security incidences during the research period which seriously impacted on the teachers' willingness to work in the schools, and on the students' ability to attend. This also had an impact on the programme reporting from the secondary schools, and their ability and interest in taking part in this study.

There are gender imbalances in the student and teacher populations: whilst there is a significant population of Kenyan national teachers at all levels, female incentive staff make up only 6% of primary teachers and 3% at secondary. As Gomez (2013) notes, there is a cultural norm in Dadaab which views teaching as a male profession, possibly because of the predominance of Muslim Somali culture. In total, 90% of teachers in Dadaab are unqualified according to national teaching standards in either Kenya or Somalia. Around two-thirds are enrolled in accredited or professional development

courses leading to either certificates or diplomas (Taylor and Karanja, 2016) though these may be in social sciences or other subjects rather than teaching specifically. Incentive teachers are ineligible to join Kenyan national programmes or teacher training colleges, other than a very small number of refugees who are awarded scholarships and permitted to travel within Kenya to take these up. 100% of incentive teachers are reported to have received training by the implementing agency that supports their schools. However, for training to be accredited by UNHCR it need only consist of a minimum of ten days of instruction (Dryden-Peterson, 2011, p.6). This limited training is often given to people who have never taught before and may have only basic functional literacy in the medium of instruction. There is a limited amount of literature on the training provided to untrained teachers in refugee settings, but there is anecdotal evidence that such programmes are focused on rote-based, low quality learning approaches (Spink, 2004).

In spite of the challenges with accessing quality education, it still holds a significant value for most refugees:

A visitor to Dadaab can see that the refugees are, in a sense, not truly living there. They are living in a present that is wholly oriented to a brighter future; a future filled with hope and opportunities. Education is hope. Education is the key – the way out. For this reason, education certificates are valued more highly than almost any other possession.

(Kirk, 2009, p.183)

However, the political discourse on Dadaab and the Kenyan government policy on return to Somalia has impacted on community perception of their future, and therefore on engagement with education. Attendance at school is very low, being recorded as around 60% in September 2016, reported as being due to the impression that repatriation will be forced and that there are no opportunities for quality education in Somalia (Taylor and Karanja, 2016).

[Security challenges affecting the research](#)

Insecurity is rife in Dadaab. Amongst the refugees themselves, Somali clans and sub-clans are purposefully separated by distance as these loyalties can be a major cause of tension and conflict (Horst, 2006). The size of the population and the extent of their

needs has also caused issues with the host population, including the use of local resources and infrastructure, and criminal gangs have attacked, robbed, and raped refugees (Horst, 2006). This insecurity directly impacts on education. During one of my research visits, a Kenyan national teacher was kidnapped; during another a teacher accommodation block was attacked and a teacher shot dead by alleged militia. Earlier in 2015, militants operating out of Dadaab were accused of being behind an attack on the nearby Garissa University, where almost 150 students were murdered. Within this climate of fear and uncertainty on both sides, the security context for my research was extremely challenging. In November 2015, following the September kidnap of the teacher, I was refused permission to visit schools or leave the UN compound. During other field trips, visits to schools were cut short or cancelled at the last minute, and visiting schools at the furthest ends of the camp was not possible. Whilst I was able to interview some teachers at UNHCR offices, this required additional security procedures, time and travel for those teachers which also made them less appropriate. I recorded these in my reflective journals, and noted articles from newspapers and other sources to better piece together the macro context in which the teachers participating in my research live. With these dynamic shifts in national and global policy, and the possible impact on refugees, the context of teacher narrative in Dadaab will continue to change.

1.7 Importance of the study

This study contributes to the literature and to the body of academic and professional knowledge in three main ways:

Building a picture of refugee teachers:

Understanding teacher perception, especially where a teacher is hesitant or in doubt, can also pinpoint where processes of reflective thinking is catalysed (Dewey, 1910/1997) and highlight places where support and development can be focused. In all school settings,

Locating and exploring teachers' perceptions is important for teachers, researchers of teaching, and teacher educators, because such perceptions serve as the catalyst for a reflective thinking process [and] oftentimes can get lost in the process... (Vagle, 2009, p. 579)

In refugee settings this is even more the case, and the lack of evidence on teacher perception was noted in the literature as both a gap in knowledge and a serious challenge to the design of successful interventions. This study aims to contribute not just to a better understanding of how the programme can be reiterated to better speak to teachers' needs, but to act as a reflective process which can contribute to the body of knowledge in this area.

Generating understandings about teacher interaction with education technology interventions in refugee camp settings:

Considering technology in a scenario where there are urgent basic needs may seem counter-intuitive. In his conclusion to his book on the use of education technology in British schools, Selwyn (2011) notes that his study is an irrelevance to those living 'entrenched political repression and poverty' in the developing world (Selwyn, 2011, p.144). I would disagree, and I believe that the literature and my findings suggest that the digital age is of particular relevance to those living in disadvantaged contexts. Understanding not only the educational impacts of interventions, but also the impact on power, systems and relationships is crucial. My findings indicate that teachers perceive a symbolic value of technology in the classroom regardless of the quality or accessibility of the intervention, suggesting that there is a need to consider not just the functionality of education technology in refugee settings but also the impact of *perceptions*.

Whilst there are attempts to start building an evidence base of 'what works' (UNHCR, 2017a; DFID, 2017), much of the research focuses only considering the use of specific interventions by students. In addition, this is moving slower than either the urgency of the challenge or the rate of donor funding being allocated to such programmes. There is a significant opportunity to contribute to the foundation of professional knowledge by analysing teacher perceptions and making recommendations for both design and implementation from the perspective of education provision, but also related to wider structural changes.

Using activity theory as a tool to explore the complex relationship between refugee teachers and technology:

As ‘activity theory seeks to understand the unity of consciousness and activity... the product of an individual’s interactions with people and artefacts in the context of everyday practical activity’ (Kaptelinin and Nardi, 2006, p.8), I focused on the lived reality of teachers in Dadaab and how they experience the introduction of a new tool into an existing activity system. By using the lens and processes of activity theory, this study offers a reflection on these tools and approaches to practitioners and researchers working with the complex juxtapositions of actors, policies, power and aspiration found in refugee education. The challenges in considering these is well noted in a small pool of recent research (Dryden-Peterson, 2016, 2017) and this study makes a limited but timely contribution to meeting those challenges.

1.8 Thesis Structure

Chapter one introduces the rationale for undertaking this study, and the background and development of the research through a pilot phase. As well as describing the Instant Network Schools programme, the intervention being researched, it also presents the context of the Dadaab refugee camp and situates it in the cultural-historical context needed to understand the activity systems therein. Finally, it establishes three major contributions to the professional challenges faced by practitioners, namely: contributing to the understanding of refugee teacher perceptions; building a picture of how education technology interventions are used in refugee settings; and, using activity theory to understand the interplay between these two elements.

Chapter two summarises and analyses relevant literature. This covers three main elements: understanding education in emergencies, and the policies, frameworks and practice associated with refugee education, and building on the finding that teachers are one of the most crucial elements of effective education systems in challenging contexts; delineating concepts around teacher perception, learning and belief, including teacher uptake of interventions and new tools; and reviewing different approaches to introducing technology into the classroom, with a focus on findings in developing world or humanitarian settings. Through a critical review of these three areas, chapter two

provides the framework in which this study considers teacher perceptions of, and their engagement with, an education technology intervention.

Chapter three presents activity theory as a lens, providing a historical background to the theory and a critical exploration of the underpinning epistemological and ontological viewpoints. Following this, a detailed review of the 'activity system' is presented, including a review of activity theory literature and how researchers have used the different parts of the activity system in their work. Finally, approaches from the literature to nested activity systems, and ways of considering these in understanding the relationship between refugee camps and host communities, are presented.

Chapter four introduces the conceptual framework of the study and presents a detailed research design and methodology. This reviews the research instruments, data collection and analysis plans, as well as reflecting on how these were revised during the study. There is focused exploration of the conducting of the 21 semi-structured interviews, and on the research conditions and limitations in the Dadaab refugee camp. Lastly, this chapter reflects on the ethical issues in conducting research with refugees, and from a position of power as a practitioner, and establishes the approach I took to these challenges.

Chapter five presents the findings and discussion from the research. Based on analysis of the interview and data collected from field journals, this explores findings both within the activity system of Instant Network Schools in Dadaab, and how it relates to the macro-policies affecting refugee education. This includes a synthesis of the findings in relation to the literature presented in Chapter Two, presenting challenges to the current position in literature around teacher uptake of technology, and exploring the tensions and contradictions between the reality of the intervention in Dadaab and the findings of the literature.

Chapter six concludes the research, presenting recommendations for policy, further research, and practice.

1.9 Chapter Summary

This chapter has introduced the research problem – the need to better understand teacher perceptions of technology-based interventions in refugee camps – and situated this within the current challenges of researchers and practitioners. It has also introduced the distinct cultural-historical context of the Dadaab refugee camp, anchoring the teachers, schools and the activity system being researched within their environment.

Chapter 2: Literature Review: Education in crises, teaching, and technology

Chapters Two and Three present the literature, aiming to critically review the scholarship in the relevant fields to examine any gaps in the literature and establish the context and contribution of this study. This chapter presents a review of the literature on a number of themes, with the aim of creating a lens through which to understand the teachers involved in this study, and to understand the gaps in the literature. Firstly, I investigate beliefs around teaching and learning in order to situate my study in the epistemology of these key concepts. Secondly, a review of the complex global policy framework which guides education in emergencies is set out, which is then related to a historical and meso-level review of where refugee education is situated. This includes an exploration of the recommendation that teachers be supported as the key to improving education in emergencies, and suggested approaches. Thirdly, I present a brief review of relevant approaches to technology in classroom settings, setting out recommendations from the literature for the design of such programmes. Finally, I present a review of teacher engagement in technology interventions, including common recommendations around the need to develop a contextualised understanding of teachers in order to design teaching and professional development interventions both with and for them.

Chapter Three goes on to present activity theory (AT) as an appropriate theoretical framework in which to explore these complex relationships, and to reflect the findings around teacher context. A historical overview of the theory is followed by a detailed reflection on the activity system, including a review of the uses of this found in AT literature that investigates changes in classroom settings. The chapter concludes by establishing the capacity of activity theory to address the needs of this research study into education and technology.

2.1 Teaching and Learning

This research explores two different aspects of learning: whether teachers feel that they have learnt enough to fully utilise new technology within their own settings; and whether teachers feel that there has been a change in students' learning and learning outcomes. Limitations on undertaking the study with children means that I did not

work with students directly to explore their own impressions of their learning experiences, rather I focus on teachers' perception of that learning. In this context, this section aims to set out some key positions on teaching and learning and establish the framework within which this study understands these constructs.

Conceptions of learning and teaching

At the heart of all approaches to education, and indeed philosophical approaches, are conceptions of knowledge and learning. The constructs of what knowledge is and how it is shared, gained, transmitted or created are the central constructs of what constitutes learning (Davis, 1994, 2005). In the thousands of years humans have spent discussing knowledge, the most persistent view is that of facts or 'knowledge' which can be transmitted. Such views are culturally and contextually sited, and discussion of the context within which my research takes place is discussed in the next section.

In terms of broad constructs, 'knowing that' something, or 'knowing of' something, is referred to as propositional knowledge (Koi et al., 2007; Phillips, 2014). This distinguishes it from procedural knowledge, or the 'knowing how to' do something (Siegel, 2010; Carr, 1993). As Siegel (2010, p.284) notes, 'For better or for worse, epistemological theorizing in the analytic tradition has centred on propositional knowledge. I follow that tradition here'. For this literature review I will also follow that tradition, as it is an approach on which the majority of the literature on the epistemology of education is founded and one I agree with. I will then discuss whether these traditions are relevant to education in sub-Saharan Africa in general and my research context in particular, and end by presenting the framework in which my research will consider teaching and learning.

Davis (1994, 2005) usefully summarises the historical approaches to learning and the sharing of knowledge as metaphorical traditions. Others (Hager, 2004; Hodkinson, 2004) acknowledge the reliance on metaphors to talk about learning, though they note that metaphors themselves are socially constructed and therefore challenging. The first metaphor is that of transfer, in which knowledge is given or imparted to learners (Haskell, 2001). This is one step on from 'transmission' because transfer brings with it an assumption that the learning has transformed the student's own knowledge – of other things, or ability to act and so on – through being accommodated within their

broader knowledge (Hoover, 1996). Whilst the concept of accommodation was developed by Piaget (1952) who is a founding father of constructivist thought, it is a difference between seeing learners as people who can be 'filled' with transmitted knowledge, and instead taking the view that a more complex occurrence takes place whereby new learnings shift existing thoughts and can be transferred from the specific context of the learning and applied to new settings. There are fundamental epistemological and philosophical challenges to this metaphor, both in terms of what is transferred and how. There are additional challenges to the power assumptions and structures embedded within the relationship between a giver and a receiver. Whilst in the UK these distinctions seem outdated, in Kenya traditional approaches to teaching and learning are still very much in evidence (Hardman et al., 2009).

Secondly there is the metaphor of construction. This is the more contemporary belief that learners construct their own knowledge from new information, skills and experiences, and the role of a teacher is to support them in this scaffolding process (Vygotsky, 1978; Daniels, 2001; Verenikina, 2008). The constructivist position can be beset with internal debates around truth and belief, which are relevant to all conversations of knowledge but come to the forefront in discussions of whether all construction has equal results. These questions are central to the relationship between epistemology and education. There are several challenges to this position where particularly the concepts of truth are contested but these have had little impact to the generally accepted epistemological position that there are agreed constructs which are 'true' (Code, 2012; Taylor, 1987). The crucial central view that learning is a social process – and that truth can also be socially agreed (Bruner, 1973). This is a clear difference from the transfer metaphor, and represents the intellectual split between Piagetian and Vygotskian traditions, in which Vygotsky (1986) sees learning as a collective activity in which knowledge is jointly constructed. This social element is also linked to the other major difference, which is that of subjectivity, or contextualisation.

The social and subjective nature of the constructivist paradigm in relation to learning fits with my own ontological position that each person experiences the world differently; and that by understanding their experiences of phenomena we can better approach them in the future (Dewey, 1938; Piaget, 1954; Vygotsky, 1978). Within this, my research will take the constructivist position on learning: that people learn through

the process of active construction (Duffy and Jonassen, 1992; Mascolol and Fischer, 2005). The social constructivist position broadly maps relationships within an education context (Perraton, 1998; Piaget, 1954; Siemens, 2004) focusing on supporting learners (including teachers who are learning new skills) to construct knowledge based on their own social experiences and interactions.

Postcolonial education: conceptions of knowledge

There is a tension within the literature which is of particular importance to this as a cross-cultural study: whether colonialist, Eurocentric epistemological approach to learning holds true in sub-Saharan Africa. This relates closely to the challenges to the construction of truth outlined above. Cary and Mutua (2010) make a useful post-colonial analysis of power and discourses in educational institutions using Foucault's (1977) discourse framework. This outlines the ways in which epistemological approaches can undermine or exclude the knowledge or the experiences of certain groups of people. Abah et al (2015) and others (Howden, 2001; UNESCO, 2014) argue that this is systematically done through the dismissal of 'indigenous knowledge' on which traditional African education systems were built. They argue that these systems are more integrated into daily life than with the Western approach to education, and that the school system of external (foreign) knowledge for an unclear future purpose must be challenged for a system of teaching and learning to be meaningfully created anew. There are also challenges to the epistemology of education and constructs of knowledge, as:

Indigenous ways of knowledge creation are based on locally, ecologically, and seasonally contextualized truths... In contrast to the aspirations of some Western scientific traditions for universal truths, Indigenous epistemologies are narratively anchored in the natural communities characterized by complex kinship systems of relationships among people, animals, the earth, the cosmos, etc. from which knowing originates. (Abah et al., 2015, p.669)

These are particularly relevant debates to this research as there was no discussion in the literature I found on education in Africa that tried to unpick what this might mean for displaced communities – or indeed urban elites and others – who may be far removed from the kind of traditional approaches outlined in this school of thought. It

also presents a critical challenge in using the majority discourse to underpin my own study. I found little research into the epistemologies of knowledge for either Somali communities, or for refugee communities. This is an area for much greater research, and the lack of such literature is a limitation to this study. The little we know comes from ethnographers and from those interacting with the Somali diaspora, and this is rightly challenged (Hadid, 2015) as providing a traditional colonial narrative when a post-colonial lens is required.

Epistemologies in Somali education

Writing in 1961, the anthropologist I. M. Lewis noted:

From an early age, every Somali is taught the genealogy which links him to the eponym of his clan-family, and genealogies are proudly cherished and sometimes recorded in writing. To a marked degree a person's range of genealogical knowledge varies with his age and status. Important clan elders and Sultans usually not only know their own genealogy to the clan family founder, but also, in keeping with their wider political responsibilities, the total genealogical structure of their own clan and often much of that of their clan-family. (Lewis, 1961, p.98)

More recently, in his book which aimed to share stories from Dadaab, Rawlence (2016) also found that traditional education in Somalia focuses on Quranic recitation and Islamic study; and the complex oral recall of Clan histories. This picture raises some crucial points about the epistemology of knowledge for Somalis, as well as crucial constructs of teaching and learning, notably that the recall and recitation of both Quran and Somali Clan lineage clearly follow a transmission approach to the sharing of knowledge, and a construct of truthful knowledge which is absolute. In a related discussion over the credibility of Somali elders taking part in constitutional reforms (Somalia Report, 2012), elders themselves note that power in general, and qualifications for leadership within community and more formally within government in particular, should depend on 'traditional education' rather than 'western' learning.

This raises two significant tensions. The first is the extent to which the Kenyan education system as implemented in Dadaab is accessible to Somali refugee children, especially when delivered by Somali teachers. If the epistemological approaches and

framework between the curriculum and students are fundamentally different, what is the impact on learning? The second is the added layer in the design of the Instant Network School, which was externally built on Eurocentric approaches which may not be relevant to either the rules of the Kenyan system or the personal experience of Somali refugees. These are further considered in the Discussion (pp.148-163).

Postcolonial education research and legitimacy: tensions in 'Somali Studies'

The other area where this epistemological dichotomy matters is in my research framework. There are entrenched challenges within postcolonial education, and indeed within my own research as a white European researcher studying education within another culture. These challenges are compounded by the dynamics of refugee communities and the freedom to postulate about people with limited agency to take part in the debate. In recent years, an academic debate between contemporary Somali thinkers and non-Somali Somali studies experts debated this challenge by launching discussions around 'Cadaan Studies' (Somali for 'White Studies'). Starting as an online response to the launch of a Somaliland Journal of African Studies (SJAS), Haidid (2015) called for reflection on the fact that such a journal has no Somalis on its board, editorial committee or writing articles for the inaugural edition. In responding to criticism, the Editor, Markus Hoehne stated, 'I did NOT come across many younger Somalis who would qualify as serious SCHOLARS—not because they lack access to sources, but because they seem not to value scholarship as such' (Hoehne, 2015, p.1, capitals in the original). This shocked the academics he was in debate with, and led to the closure of the SJAS.

This dismissal of the Somali culture of education and the judgement of Somali scholarship solely on the standards and epistemologies of other countries, raises a serious question for both researchers and those designing education programmes which are to be implemented by teachers from a very different culture. Throughout this study, I have wrestled with the challenge that I am replicating the old historical norm of 'the European colonial encounter with the African, and the twinning of academic knowledge production with the colonial project' (Aidid, 2015). This is especially relevant because of the focus on one technology intervention which was a development project designed without the engagement of the community. These

dichotomies were touchstones during this research which I returned to, both in terms of member checking and legitimacy, and through a personal reflection of what it means to be a powerful outsider within the international community's response to refugees.

2.2 Education in Emergencies and Protracted Crises: the global context

Education is a fundamental human right, enshrined in a range of global statutes. It provides a pathway to lifesaving information, to protective resources and spaces, and is the most effective route to increasing life chances, building children's resilience in fragile settings and to reducing poverty and inequality (Barakat and Hardman, 2010; Mosselson et al., 2009; Winthrop and Matsui, 2013; Rose and Greeley, 2006; Burde et al, 2016). But 25 years after the adoption of the World Declaration on Education for All, and 17 years after the Dakar Framework for Action agreed the two education-related Millennium Development Goals (MDGs) and six updated Education for All (EFA) goals, teachers and students living in emergencies are still at the sharp end of the education crisis. Of the 58 million out of school children globally, 36% live in countries scarred by war and violence. More than one third of refugee children globally are missing out on primary education (UNICEF, 2015) and the safety and education of girls are disproportionately affected (Jones and Naylor, 2014). The post-MDG agenda focuses on the proposed Sustainable Development Goal (SDG) on education which, with the Incheon Declaration adopted at the World Education Forum in 2015, outline a vision for sustainable and equitable education spanning pre-primary through to at least lower secondary. This recognises the need to focus on the quality of education as well as access. This includes support the most disadvantaged children, not least those living in crises where educational provision can reproduce and amplify underlying inequalities (Briedlid, 2013; INEE, 2011; Mosselson et al, 2009; Winthrop and Matsui, 2012; Poirier, 2012; Baksh et al, 2009).

Dryden-Peterson (2016, p.473) argues that changes in 'normative aspiration, codification and doctrine' of education provision can be tracked to better understand the historical engagement in education by the international community. Until the mid-1980s poor communities in low and lower-middle income countries were expected to fill the gap in education provision by themselves, or with the support of faith groups (Moswela, 2007). Normative shifts in the global position on education to facilitating

access meant that supra-national frameworks were established as governance of education shifted away from nation states. The current global policy context has changed in its normative aspiration for children. Where the Education for All framework aimed to ensure that every child was educated at least to primary level, this put pressure on educational systems which already struggled to cope with demand. The past five years have seen a range of criticisms levelled at the MDGs, with commentators and practitioners arguing that the resources spent on trying to meet the MDGs have only been partially successful because the focus was based too much on 'business as usual' (Waltham and Sayed, 2013; UNESCO 2013). Several studies of the EFA framework have noted a 'shift in the global conversation on education from a focus on access to access plus learning' (UNESCO, 2013, p.i): moving from viewing access as the only indicator of success to a focus on quality and the need to address challenges where children may drop-out, fail exams, or not learn during their education (Petrosiono et al, 2013; UNESCO and UNICEF, 2014). This normative shift to quality rather than access alone continues to dictate the focus of global policy, though it is an enormous challenge. Within this global framework, it is important to note that there is an expectation that nation states are responsible for the provision of education, within the globally agreed frameworks, and in many countries in low and lower-middle income countries with additional funding and technical support.

2.3 Refugee Education and Protracted Crises

Dryden-Peterson's (2016) review of more than 200 original UNHCR documents found that 'refugee children are caught between the global promise of universal human rights, the definition of citizenship rights within nation-states, and the realization of these rights in every day practices' (Ibid 2016, p.473). This summarises the challenge in understanding schools in refugee camps, affected as they are by the tensions between different and conflicting systems. Refugee education has traditionally followed the same pattern as the changes in the macro-level framework outlined above, but with the crucial element of the nation state as responsible body being absent and the tensions within and between power structures taking on these roles (Dryden-Peterson, 2016).

Refugees are defined under the United Nations Refugee Convention (1951, p.3) as people who have crossed international borders due to a 'well-founded fear of being

persecuted', and who are granted or awaiting refugee status in a host country (UNHCR, 2010). The time during which this study was written (2013-2017) was a period in which numbers of refugees reached the highest number since the Second World War. More than 65 million people have been forcibly displaced, with 21.3 million of these counting as 'refugees' under the definition given above. More than half of this population are under 18 years old (UNHCR, 2017). The research period was also defined by the global discourse on refugees: legitimacy of the definition of refugees and who decides; who and how the international community should respond to crises, especially those which impact on them personally; and how to address root causes of displacement. There was also an increased recognition of two facts: that 86% of refugees are hosted by neighbouring countries, contrary to the dialectic in much of Europe about the 'flood' of refugees, based on the increase of migrants arriving via precarious boats (for example, BBC, 2016); and that the perceived temporary nature of refugee status is contrary to the long displacement of millions of people. UNHCR (2004) estimates that the average duration of displacements is 17 years, though this has been contested as a false statistic which does not take into account the dynamics of displacement which can include return, forced moves, and other transitions (Devictor, 2016). Devictor and Quy-Toan's (2016) more nuanced analysis finds that around 5-7 million people have been refugees for more than 20 years. This raises some challenges with both the collection and analysis of data: as refugees are necessarily a dynamic population, who may answer formal questions based on their perceptions of what will give them the best life chances in a precarious situation, gathering accurate data can be challenging (Jacobsen and Landau, 2003). It is agreed that UNHCR collects the most coherent data sets (Sarzin 2016) and I focus on these in this study, noting additional areas where data can be difficult.

This study is located in Dadaab, which is considered a Protracted Refugee Situation, defined as one where more than 25,000 people of the same nationality (or other relevant metric for persecution under the 1951 Convention on Human Rights, such as religion) have been displaced for more than five years in a given asylum country (UNHCR, 2015). This does not mean that the 25,000 people must be the same individuals: it is instead an assessment of the trend. A Protracted Refugee Situation is 'one in which refugees find themselves in a long-lasting and intractable state of limbo.

Their lives may not be at risk, but their basic rights and essential economic, social and psychological needs remain unfulfilled after years in exile' (UNHCR, 2004, p.1). This resonates with the definitions of 'emergency' and 'protracted crisis' as outlined in the introduction (pp.18-19), but also recognises the challenges to agency and opportunity that come with protracted emergency settings.

2.4 Refugee camps: Contested spaces

A tension in the literature emerges between the perception of refugee camps, and the reality. Imagined originally as a place of safety for those fleeing violence and oppression with only their lives intact, camps were designed to provide a safe haven for people in the worst emergencies. Compare this to the testimony of refugees in Dadaab who say, 'Our lives in the camps are far worse than you can imagine. We live in an open prison, far away from justice and humanity. We talk, but our voices are never heard. We move, but only inside a cage' (Refugee Silent Welfare Committees, 2010; quoted in Wright, 2010, p.69). Conceived as transitional spaces with a primary aim of providing shelter and meeting basic needs such as food and water, refugee camps were intended to be – and in common thought remain –temporary. Dichotomies between these plans and the protracted crises of current camps, along with disparate understandings of how individuals and social structures change within the setting, mean that camps are contested spaces in terms of how people, communities and places are constructed.

Whilst powerful, this image conflicts with reality in a number of different ways. Firstly, camps cannot be automatically assumed to be temporary. With the lengths of stay outlined above, a child can be born and complete primary and secondary education without ever having lived elsewhere. There are challenges to the lexicon used in the development sector, with a decades-long focus on responding to emergencies. Whilst emergencies are of course critical times in which aid is required, the needs, opportunities and approaches to response are very different from long-term change, hence the recognition of the state of 'protracted crisis'. The United Nation's Food and Agriculture Organisation (2010) recognises the challenge in clearly defining a country in protracted crisis but notes the following as key characteristic: recent natural disasters; longevity of food shortages; violent conflict; economic shocks; and the

breakdown of national and local institutions to cope with these. Both Kenya, the country which hosts Dadaab refugee camp and Somalia, the country of origin for more than 95% of Dadaab's inhabitants, are considered protracted crises. The term can be used to refer to a long-running and complex conflict (such as in the case of the east of Democratic Republic of Congo) or a situation which is a dynamic, and possibly cyclical, mix of conflict, poverty and natural disaster (such as Somalia). Refugee camps which may be hosted in countries which are themselves stable and middle income (such as the camps in Greece) can still be considered protracted crises, not least because of the chance there is a knock-on effect to the host country's well-being.

The lifecycle of a refugee camp can change over time: from an urgent meeting place of a few people relieved to cross an international border, to an internationally supported camp for half a million people, approved by the host government and managed by UNHCR. The discussion below focuses on these formalised camps, but where research is referred to which deals with a broader context, I have noted this. The duration of camp life impacts on the provision of basic services and on the concept of safety. Conceived of as havens, camps are dangerous places in which there are insufficient amenities and crime is rife. Many people flee from violent conflict, and often that conflict follows them through inter-tribal or clan violence, political retaliation, and sexual and gender-based violence (SGBV). The longer a camp runs for, the smaller are the handouts of food and basic non-food items such as cooking fuel, collectively known as rations, and the more local natural resources such as firewood, are decimated. There is a catch-22 where camp policy forbids refugees for working other than for nominal payments as incentive staff to UN and INGO projects, but also expects them to start generating their own income and become self-sustaining, motivated through the reduction of rations. This discrepancy leads to crime, as people struggle to support themselves (Horst, 2006).

A second key concept from the literature review is the contested idea of 'bare life'. Coining the phrase, Agamben (1978) is the best known theorist on the normative position of people within camp systems, and argues that refugees are reduced down to bare life: to only the soul and the body, but without connections, community, possessions or future orientation. This has been seen as either a view on the state of refugees by the time they arrive in a camp or alternatively how they are constructed by

those who are in charge of the camps. There is a body of research focusing specifically on how this impacts on the communities which exist in the camp: through traditional tribal, national or religious distinctions which people bring with them; through the same distinctions in ways which become important once in the new setting; the communities of proximity for those people who live near to each other and share scarce amenities; and those which are forced by administrating authorities for the purpose of management, such as 'camp leaders' or 'youth associations'.

Agamben's concepts of bare life have been a central point of discussion on camp life and management (Diken and Laustsen, 2005; Herlihy et al., 2010; Agier 2011). Whilst the original construct looked at spaces where people fell between rule of law and political reality, Agamben (1978, 1988) argues that refugees are the ultimate biopolitical construct, existing in a permanent state of exception. Existing totally outside of normal social structures, their lives are governed, regulated and administered by external forces, refugees exist within a permanent state of exception. This is seen in part as a reaction by host countries and the international community to the fact that refugees,

Represent such a disquieting element in the order of the nation-state...above all because by breaking the continuity between man and citizen, nativity and nationality, they put the originary fiction of modern sovereignty in crisis.

(Agamben 1998, p. 131)

Along similar lines, Soguk (1999) argues that refugee camps are created both in and against the image of the nation state; refugees are characterised as a threat to 'nationhood' by existing without it, but also being managed by a host nation which can choose to apply legal and social systems or not. Agier (2014) explores this line further, and puts forward the view that camps are likely to become more wide-spread and varied, used as an approach to contain 'the world's residual remnants' (Agier, 2014, p.3). Within a camp setting this can also lead to closeness and the creation of new identities. Anderson (1983, 2006) uses the phrase 'imagined communities' to talk about nationalism where people feel a kinship with others whom they have not necessarily met, noting 'Community is imagined, or constituted then, in specific historical conditions and against a backdrop of political interests... communities, where imagining certain affinities reinforces and is reinforced by ways of speaking and acting

together and by practices of inclusion and exclusion that reify imagined borders’ (Anderson, 1983, pp.326-7). Since then, the term has been utilised in different fields, notably language learning (Norton 2010; Murray 2011) and it has been used extensively in exploring diaspora communities (Echeruo, 1999; Sökefeld 2006).

These two challenges of perception – of the temporary nature of the camp, and the needs which are considered legitimate for camp inhabitants – together have a significant impact on the provision of education for refugees. The first, by its nature, rejects the provision and focus on education because it is not viewed as something which is essential to survival. The second constructs bare life as people who are outside of the kinds of structural norms which dictate educational approaches and content. Within this context, education has been viewed as a tool for the passing on of other information such as messages on health, and as a protective space where children can be kept safe from harm. There is limited discussion either in the literature or in the practitioner spaces in which I work about the purpose of education and how the approaches fit with the challenges of community, and indeed the challenges with economic opportunities after school. The contested nature of culture in particular has a strong impact on the provision of quality education in this setting, and also on learning outcomes as children struggle with unfamiliar concepts and languages and where there is no remedial support to bridge that gap. How these issues impact on education in Dadaab are further considered in Chapter 1 on context.

2.5 The importance of teachers in education in crises

In their reflection on developing quality education in emergencies, USAID summarised the importance of teachers: ‘Quality teaching provides quality education for the future generation. A well-educated future generation provides peace, security and progress’ (USAID, 2009, p.11). It is more widely recognised that teachers’ actions, approaches and skills are a clear indicator on the provision of quality education (Sammons et al., 1995; Teddlie and Reynolds, 2000; Day and Sachs, 2004; Moon, 2013). But the destruction wrought by protracted crises can have a hugely damaging effect on educational infrastructure (Burns, 2013; Seitz, 2004). At its most obvious level, the lack of physical resources such as buildings, school furniture, books and so on, alongside the shift of state resources away from education and other basic services, means that the

infrastructure needed to provide education can be almost completely missing, including support for educators: 'Violent conflict destroys education infrastructure, reduces spending on schools and teachers and prevents children from attending classes' (UNDP, 2005, p.159).

There are specific impacts on teachers in emergencies. In their meta-analysis of data from aid agencies, Burde and Linden (2012) found that teachers, particularly those in refugee settings, suffered from their own traumas; were challenged in running schools which included groups from different sides of a conflict; and struggled to navigate the politicised context in which they work. Many are new to teaching, un- or under-trained and lacking in confidence (Winthrop and Kirk, 2006). This is especially true in refugee or Internally Displaced Person settings where the most able individuals in the community step in to become teachers regardless of previous experience (INEE, 2015; Telford, 2013). There are other reasons for the lack of teachers: educators may have been specifically targeted during conflict; or their own status and educational background may have put them in a position to settle elsewhere or to take on other jobs. It is especially hard to recruit female volunteer teachers as women often have a lower educational background than men, or family duties or norms may prevent them from moving to take up new positions (Sinclair, 2007; INEE, 2015). This can further exacerbate gender inequalities, both in contexts where girls are expected to be taught by women, and in the ability to manage threats of sexual violence against girls by male teachers.

There is a recognised lack of literature on teachers in protracted crises (Bennell, 2004; Mulkeen, 2010; Penson et al., 2011). Sesnan et al. (2013) note in particular the lack of literature on refugee teachers, where the majority of studies focus on children. In their meta-analysis, Ring and West (2015) argue that this lack of data means that programme interventions involving teachers suffer in the design phase, as programme planners and practitioners are not engaging with well-understood needs. They also note that understanding the different intrinsic and extrinsic motivations between teachers in development, emergency and refugee settings is crucial in preparing to engage and support teacher practice. Lack of knowledge around the legal, social and professional status of such teachers, and in particular refugees, also means that, '[T]he

lack of literature on refugee teachers in developing... countries is a serious obstacle to understanding their needs.' (Sesnan et al., 2013, p.11).

2.6 Teacher Professional Development

There is a diverse and significant body of literature on the importance of teachers in non-emergency settings, and on approaches to the support available to teachers which I reviewed in order to ground the study of teachers in challenging circumstances in best practice whilst recognising where it is hard to make generalisations. Teacher Professional Development, or TPD (which refers usually to all in-service teacher training) is usually linked closely to the improvement of education delivery and to learning outcomes and to effective schools. Hattie's seminal meta-analysis (2009) involved research from 83 million students, and identified the 100 most important factors effecting learning and situated the teacher and their teaching approach in the top six factors. There are some challenges levelled at meta-analyses in general and this study in particular. A critique of the work (Higgins and Simpson, 2011, p. 197) begins with the observation that 'Eysenck [1978] described ill conducted meta-analyses as 'an exercise in mega-silliness'', citing the difficulty in analysing effect sizes across very different data to make generalisations. Without specifically focusing on the effect sizes, the overall picture from the literature is of the paramount importance of the teacher and their teaching approach on children's learning.

With that caveat, Ring and West's (2015) meta-analysis of teacher retention in emergency settings looked for common themes rather than generalisations. They found seven key themes which are influential in motivating or demotivating teacher retention and attrition:

1. Teacher recruitment, selection, and deployment;
2. The teaching environment;
3. Certification;
4. Professional development;
5. Incentives;
6. Management structures; and
7. Status and social recognition (Ibid, 2015, p.106).

I focused particularly on reviewing literature on training and support of teachers, as this area was central to the research questions' focus on the design and implementation of the Instant Network Schools Programme. In the introduction to the online International Network on Emergency Education (INEE) discussion on teachers in emergencies, Mary Burns (2013, ¶1) notes:

The 'crisis'[in education in emergencies] exists because we cannot give children universal access to a quality education unless we ensure that they have access to a quality teacher—and the [standard] mode of professional development...does not cultivate or sustain or support quality teachers.

Research on teacher support within emergency and development settings found a broad range of additional challenges for teachers, including lack of confidence, lack of seeing oneself as a 'teacher', and concerns around pedagogy and subject knowledge (Stuart and Kunje, 2000; Zajda, 2010; Power, 2012; Sinclair, 2007). The lack of comprehensive teacher professional development and support during emergencies is noted as a key theme in the literature on education in emergencies (Burns, 2013; Sinclair, 2007; Kirk, 2007).

In her work on international education, Timperley (2008) emphasises that the cornerstone of effective teacher-learning is the ability to tailor solutions to individual contexts – recognising the uniqueness of each teachers' experience, approach and skills as well as the specific needs of their pupils. In addition to this there is recognition that the implementation of, and commitment to, personal development depends on the teachers' environment. Specific literature around how teachers embrace (or reject) new practice and new technology (Sparks and Hirsh, 1997; Day and Sachs, 2004) link the format and amount of teacher professional development to practice uptake, as well as to the organisational and structural approaches to change. Others (Guskey, 2002; Stutchbury, 2013) focus on teacher motivation and the impact that motivation has on uptake of new practices. Understanding teacher perception of how the three areas outlined by Timperley (2008), and understanding teacher uptake and motivation in the Instant Network Schools programme are key elements of the research questions.

Teacher beliefs impact on how they design, plan and deliver their classroom interactions (Fang, 1996; Guskey, 2002; Zevenbergen, 2004). Internal belief systems, experiences and approaches combine to create teacher self-concept, encompassing

teachers' beliefs about themselves as individuals and their beliefs about their teaching and content capability. In addition to these individual beliefs, teacher practice is significantly framed by external environments, both institutional in relation to their school and wider community, and their socio-cultural context (Kirkwood, 2009). In protracted crises such as Dadaab where the socio-cultural context is complex and contested, and where many refugee teachers will have been impacted by trauma, these contextual domains can be challenging to understand in a way that facilitates supporting teachers. Indeed, 'initiatives for ICT in education are [also] proposed and implemented in a cultural and political context that reflects a number of tensions and contradictions' (Loveless et al., 2011, p.3). Developing an understanding of the context of teachers, their institutions, and the development of technology-based interventions then, is key to understanding the interplay between the three.

2.7 New solutions? Introducing technology

In the introduction and the discussion of the global policy framework above, I outlined the size and scope of the challenges to education in emergencies and refugee contexts. There are concerns that the resources needed to meet these challenges using traditional methods will not be found (Burnett and Felsman, 2012), including the stark challenge of insufficient teachers. UNESCO statistics (2016) show that an additional 24.4 million school teachers are needed to meet the Sustainable Development Goal of providing every child with access to primary education by 2030. This includes the creation and staffing of 3.4 million posts. There are geographic inequalities with children in the low-income countries being disproportionately affected: in sub-Saharan Africa, 2.4 million extra teachers are needed immediately to ensure universal access to primary education. With a global crisis in teacher numbers and in funding for education generally and in conflict affected populations in particular,

Business as usual is unlikely to meet the education needs of populations affected by crisis. While current approaches have undoubtedly played an important role in maintaining a lifeline to learning, the evidence indicates that they are not sufficient to meet the needs of these vulnerable children.

(DFID, 2015, p.3)

Resource-focused responses have included attempts to establish new major financing facilities such as Education Cannot Wait (UNICEF, 2015), which are potentially catalytic

but take a long time to mobilise. In addition to this, however, there is a need to find additional solutions to the immediate problems of quality.

Technology is one option but it is not a panacea. New research is building evidence as to how ICT and related programming can support education in emergencies and refugee settings (Annan et al., 2015; Dahya 2016; Kleine et al., 2013; Raftree 2013; Stubbé et al., 2016; Wagner 2014). This builds on a deeper body of evidence around the use of technology in the low and middle income countries such as a meta-analysis of 83 studies in middle and lower income countries conducted on behalf of DFID, the UK government Department for International Development (Power, 2014). This found that the strongest evidence for the impact of educational technology on learning outcomes came from interventions using mobile devices or computer-aided learning programmes in basic subjects such as literacy and maths. Studies on literacy programmes showed improved reading fluency in either mother tongue or English through a combination of devices, content and teacher professional development (Worldreader, 2012, 2013; Murz, 2011; Piper and Mugenda, 2014; Piper and Kwayumba, 2014). In maths, there was more limited evidence on improvements in learning scores (Banerjee et al., 2007; Linden, 2008), though some findings that computer-aided learning can support maths outcomes for disadvantaged or under-achieving students (Banerjee et al., 2007; Lai et al., 2011). Whilst UNESCO for example has promoted ‘the use of ICT in education [which] can increase access to learning opportunities’ (UNESCO, 2009, p.9), this enthusiasm has not always been followed up with policy and practice, including by UNESCO themselves. Their 2017 study of teacher support notes that they are focusing on mobile phones, partly because of the low cost and widespread existence of both hardware and mobile networks in previously underserved areas (UNESCO, 2017, pp.8-9), but this is one in a long history of studies in which UNESCO heralds ‘the next big thing’.

Power’s (2014) study flags the limits on the amount and type of evidence available, noting that many studies discuss the technology-based intervention but do not describe how it works or conduct robust research into impact. Within the limited evidence pool, a small number of programmes have generated a lot of the available evidence. Two key examples of programmes in which technology interventions are formulated within teacher support and professional development are:

- The PRIMR programme in Kenya, which undertook a randomized control trial to assess the impact of a reading programme on student learning outcomes delivered through mobile devices (tablets) which were given to either a) teachers through a regional teacher training centre, b) individual teachers or c) students. Studies found a positive impact on learning outcomes, and generated a discussion around value for money as the impact of each type of intervention was similar, whilst the cost was radically different (Piper and Kwayumba 2014; Piper and Mugenda 2014).
- The English in Action programme in Bangladesh, which was a school based TPD programme which used mobile content ('Trainer in the Pocket'). Findings showed a positive impact on both students and teachers in terms of language ability (EIA 2014; Walsh et al 2014).

There are also a significant number of studies around One Laptop per Child (OLPC), but those which are robust tended to find negative or negligible impact (deMelo et al, 2014, 2017). Studies which initially seem to present ICT as a simple way of giving children in the developing world access to education (Bender et al, 2012) have been critiqued as lacking rigour and aiming to market the specific products of OLPC (Daniel, 2010; Krstić, 2008). This highlights the challenge of aiming for robust studies on learning outcomes and increased quality of education whilst focusing on delivering a certain approach at school level.

Whilst the evidence base for education technology in crises, then, is less than robust, the interest from practitioners in the sector is clear. There are a range of good practice guides which pull together learnings from pilots and individual agencies (for example, Power, 2014). Whilst a lot of this is common sense, the World Bank in particular (Trucano 2016; Trucano and Dykes 2016) has invested in bringing together disparate information about experiences on the ground to build a picture of how to approach educational technology programming at both policy and implementation level. At a donor level, the DFID funded 2014 Topic Guide on Educational Technology and the 2011 USAID 'compendium of principles' both aim to provide guidance to implementing agencies about approaching technology programming. Studies in low and lower-middle income countries have also generated good practice guides, with authors (Selinger,

2009; Daniel, 2010; Latchem, 2012; Power, 2014) generally agree that the following are basic principles for developing strong and sustainable education technology programmes:

1. Successful projects focus away from the provision of hardware, and onto content and appropriate curriculum materials;
2. Teachers should be heavily engaged and supported through a combination of in-service and pre-service teacher training
3. A range of partners need to be mobilised, including Governments;
4. ICT should be interpreted broadly, and practitioners should be prepared to consider how mixed-media programming might be appropriate for different sections of society.

Such guides also respond to the enthusiasm around the potential that educational technology has to help meet the enormous challenges faced by the education in emergencies sector. Since 2015, donors have launched a plethora of different grants and competition streams, including #EduAppsforSyria, launched by the Norwegian Agency for Development Cooperation (NORAD) in 2015: or the Humanitarian Education Accelerator, funded by DFID between 2016-19. These, however, have yet to translate into a robust evidence base. This is particularly true around studies which look at large-scale programmes rather than small pilots. In the baseline desk review conducted for the Humanitarian Education Accelerator for example, de Hoop et al. (2017) found only one study which looked at scaling education innovations in refugee settings. The rising interest in using technology, along with the paucity of research, means that my study can contribute significantly to the body of knowledge.

Designing successful educational technology programmes: teachers at the heart

Throughout the literature, the strongest evidence came from studies where ICT projects had been designed within a strong teacher professional development programme which was focused on appropriate curriculum and pedagogical approaches (Light, 2008; Were et al., 2007; Leach et al., 2005). Other authors focus on the importance of the programme around the technology rather than the technology itself (Selinger, 2009; Latchem, 2012) agree with Daniel's caution that,

While computers do enrich children's lives... they need to be embedded within a wider framework if they are to make a systematic contribution to achieving E[ducation] F[or] A[ll]. (Daniel 2010, p.43)

Unwin's wide study (2005) into different interventions in sub-Saharan Africa found that in spite of enthusiasm around educational technology, there was limited uptake by teachers or changes in teacher practice. Studies in Chile found that whilst ICT access had hugely increased to the point where 98% schools nationally have computer access, 'ICT is not frequently used at school' (Hinostroza et al., 2011, p.360). Whilst there continues to be recognition that technology will not replace teachers, there is a parallel position that teachers will be under increasing pressure to use technology (Snehansu, 2013; Wheeler, 2013). Taken together, this evidence suggests that whilst teachers are crucial to the success of technology in education interventions, they are not always successfully engaged.

Watters' (2015) article on the history of educational technology focusing on teachers notes that the perceived opportunities and challenges in this area have changed little in the last 100 years, and few of them have been fully realised. She quotes Sidney Pressey's 90-year old marketing guide to technologized standardised testing, which promised to, 'free the teacher from much of the present-day drudgery of paper-grading drill, and information-fixing [and] should free her for real teaching of the inspirational' (Pressey, 1927, p.552). Contemporary literature on educational technology suggests that the application of technology into schools continues to have limited impact, and as being very much a case of 'doing the same business by different means... Change leading to sameness, and the future pointing to the past' (Goodson et al. 2002, p.147, quoted in Selwyn, 2010, p.121). Other studies (Luckin et al., 2012; Fullan and Langworthy, 2013) – and perhaps common sense – highlight that there is no ability of technology to impact on learning experiences or outcomes alone; that the process of teaching and learning must be transformed both with, by and alongside technology. But understanding the perception of teachers on a technology programme in their schools will hopefully contribute to a better understanding of teachers' processes of engagement, and potentially how to support them in that transformation.

A small amount of literature reviewed cases where technology was seen to have been integrated successfully into practice in the low and lower-middle income

countries. Haßler et al. (2011) review an educational technology programme in Zambia where teachers were supported to use Open Educational Resources (OERs). Embedded in a peer-support and training system, the project reported a 'substantial increase in their use of technology in their classroom and adopted inquiry-based approaches to learning using ICT' (2011, p.17) along with improved communication and self-reflection skills. Anecdotal evidence in studies such as UNICEF (2013) suggests that it is the connectedness, connectivity and the ability to communicate with, and 'meet', other people outside of the closed setting of a refugee camp which is likely to have the impact on people's perceptions. Commentators such as Castells (1999) had focused on access to technology as the key indicator of involvement in the 'networked social order' (Benkler in Smith and Reilly, 2013, p. xii), but more recently Smith and Reilly (2013) go further and suggest that this connectedness defines and supports individuals to be globally connected citizens. This is supported by research into the impact of connectivity on the identities of higher education students living in conflict areas, such as Newby's (2009) study on tertiary education Palestine which found that being connected changed students' perception of their isolation as refugees. These studies focus not on ways that technology can simply replace moving parts of the existing education system (such as replacing books with eBooks on tablets) but how it can instead support a shift in connectedness and engagement for marginalised school communities.

Teacher uptake of technology: training, development and perceptions

The INEE online discussion facilitated by Mary Burns included a rich practice-based dialogue and included a review of possible uses of technology. This used the definition of teacher professional development (TPD) as stratified by Timperley (2008), who views some areas as especially appropriate for integrating ICT and multimedia methodologies:

1. Teachers must be enabled to learn from worthwhile content (Ibid, 2008, p.10).
Appropriate (and appropriately mediated) Open Education Resources and other multimedia or interactive materials can enhance opportunities for teachers to learn. Focusing on the content rather than the tools used to share it is where ICT-based programmes could potentially to add value.

2. Effective professional development offers multiple opportunities to learn and apply knowledge (Ibid, 2008, p.15). It is crucial to recognise that the provision of materials does not automatically improve teaching, or ensure that teachers learn.
3. For TPD to develop skills which can be embedded and used in the long term, it must include a commitment to assessment for professional inquiry (Ibid, 2008, p.13). This commitment is more likely to be sustained when there are tangible results from professional development on both themselves and on the learning outcomes of their students (Guskey, 2002).

Whilst there is a desire to bring technology into the classroom, the processes and support mechanisms are less clear. Gredler (2008) notes that in spite of a value placed on ICT skills and the possibility to introduce hands-on learning, schools in low and lower-middle income countries struggle to host child-centred socially constructivist classrooms which support hands on use of technology by students. Levine (1998) cautions that any attempts to integrate ICT into teaching and learning must incorporate a plan which is based on real needs, and which is appropriate, practical and effective. Both these points link back to the earlier discussion on epistemologies and the need to understand how teaching and learning works in practice in particular contexts, and how it can be supported. These considerations should begin with the classroom, but take into account the needs of the school, the wider community, and further afield into the district. Creating a technology-enhanced environment should focus on a specific purpose (Winner, 1980, 2000; Bromley and Apple, 1998; Postman, 1998). This also requires teachers to have focused objectives in using technology in a purposeful way in the classroom, as it can only contribute to learning if it applied to meet a particular purpose in teaching and learning (Klemm, 2007).

A wide body of research has identified several factors that are related to teachers' uptake of technology (Brickner, 1995; Bakir, 2015; Polly et al., 2010; Ertmer et al., 2012). Such factors can be divided into two primary categories: first order factors which are extrinsic and come from the environment or situation; and second order factors that are intrinsic to the teacher and reflect their instructional beliefs and experience. The majority of teachers perceive extrinsic factors as challenges in their uptake of technology (Nikian et al., 2013) including lack of support over an appropriate period of

time (Bingimlas, 2009; Jhurree, 2005); faculty attitudes and policy; access to ICT equipment, including adequate numbers and quality of devices (Baran, 2014; Nikian et al., 2013; Yan and Zhao, 2006); lack of time to prepare or work with the equipment (Cuban et al, 2001; Bauer and Kenton, 2005); and poor professional development (Koehler and Mishra, 2005). Intrinsic factors are equally crucial: '[T]eachers had a strong desire for to integrate ICT into education; but they encountered many barriers. The major barriers were lack of confidence [and] lack of competence' (Bingimlas, 2009, p.235). Teacher confidence and knowledge has major impacts (Hew and Brush, 2007; Mueller et al.,2008). In a study by Wang and Wang (2007), teachers cited their own beliefs on technology as the second most important factor governing uptake. Where teachers do not perceive that technology has an intrinsic value to their classroom practice, or can be integrated to improve teaching and learning in their context, there is very limited uptake (Hew and Brush, 2007; Ottenbreit-Leftwich et al., 2010).

Unwin (2009, p.207) notes that in order for technology to have an impact on teacher practice, it must be situated within an educational model that supports a constructivist view of pedagogy. Sense-making and ownership are seen as key aspects of teacher perception of new resources and practice (Ketelaar et al., 2012; Spillane et al., 2002), and contextualise it for themselves; When teachers are confronted with an educational innovation, they make sense of it in the light of their own knowledge, beliefs and experiences, the situation in which they find themselves, and the design and message of the policy for implementing the innovation (Ketelaar et al, 2012, p.274). This is echoed in the constructivist arc looking at the artefacts of knowledge (Lyotard, 1979) and a focus on the creation and use of digital artefacts. The 'freedom' to select, interpret and utilise artefacts is echoed in number of documents based on Sen's 'capabilities approach' (Warrington and Kiragu, 2012; Tickly and Barrett, 2011; McNeil et al., 2012) which look at teacher uptake of new materials and practices. This literature looks at freedoms, functions and capabilities, and posit that individuals construct their experiences and translates them (or discards them) depending on their ability and freedom to do so. This relates back to teacher perception and uptake, and to the ecosystem around education innovations. Such constructs are particularly useful in considering post-colonial education systems and recognising that the 'content' of knowledge is not neutral.

Across the literature, the key challenge is seen as a mix of first and second order factors, especially in interventions which focus on the integration of technology into classroom teaching and learning, rather than seeing 'ICT' as a subject or skill. Even where teachers self-report that they are using technology, there is little reported understanding of the difference between adjunct use, where technology is peripheral and adds no value to a class, and integrated use, where it is embedded in the pedagogy (Gioko, 2013). It is only through the support to teachers to integrate technology across a range of areas – lesson planning, selecting and sharing materials, classroom management including supporting the weak and uplifting the strong, and assessment – that ICT can add value to teaching and learning (Hepp et al., 2004; Bhasin, 2012; Anderson, 2012; Phelps and Graham, 2008). Whitworth and Berson (2003) assert that, as well as improving classroom practice, properly integrated ICT has the potential to improve students' capabilities in communication, problem solving, and decision making.

In considering how teachers act and integrate new approaches or technologies, a key concept is teacher agency. Agency is understood here as the way actors 'critically shape their responses to problematic situations' (Biesta and Tedder, 2006, p.11) and relates to political action, and to the critical space which is opened for the cultivation of agency, particularly intellectual. Psychologists have identified a 'conjoint model' of agency which focuses on the collective activity system and assumes that agency can be 'responsive to obligations and expectations of others, roles, and situations' (Markus and Kitayama, 2003, p.7). Teachers' own beliefs, their personal attitudes and life experiences have a central role in learning. This means that teachers' own experiences of technology has an impact on how they are able to teach with it, as their own experiences of their subjects have an impact on their pedagogy (Zevenbergen, 2004). The impact of teacher agency and personal experiences was seen as critical 'need to identify and come to grips with strategies that local actors devise for dealing with their new intervenors so that they might appropriate, manipulate, subvert or dismember particular interventions' (Long, 2001, p.233). It is useful to note that the literature around teacher agency particularly considered interventions which were seen as being top-down. The concept that teachers change practice based on their personal beliefs and cultural context is one of the reasons that I use activity theory, as this posits that

the individuals' actions and beliefs cannot be detached from their cultural and historical context (Wertsch, 1991; Demirdjian, 2012).

2.8 Chapter Summary

This chapter has presented and analysed the literature across a range of themes, and synthesised these to create a lens through which to view the context in which this study is situated. Firstly, I established the urgent needs and global discourse on education in emergencies and protracted crises, including in the particular context of refugee camps and schools in protracted refugee settings. Secondly, I presented concepts of teaching and learning for both students and teachers, with a discussion on where there are tensions in the literature between experiences in different contexts. Thirdly, an overview of teacher-led education technology was presented, finding that there are challenges in the design and implementation of projects which discount the importance of teacher perception, engagement and training. Finally, a review of the literature on teacher uptake of new practices was linked to their sense of agency, which is challenging for teachers in a refugee setting who have limited political agency which impacts on their practice. The next chapter will consider how to work with this broad range of themes through the lens of activity theory.

Chapter 3: Literature Review: The Conceptual Framework of Activity Theory

This section reviews the literature on activity theory, and aims to present an introduction to the historical background and key theories and principles of activity theory (AT).

3.1 The rationale for using activity theory

Activity theory is the lens through which I look at the focus of this study: the perception of teachers in Dadaab refugee camp of a technology-based intervention. As part of the research design I needed to identify a theory which would allow me to engage with a complex community who were themselves engaging with technology. I also needed to have space to understand tensions and transformations occurring during interaction and activity, and a lens through which I could view these interactions which acknowledged the context within which they took place. There were a number of theories which seemed to answer these needs: structuration theory, Actor Network Theory, and activity theory.

Before I undertook data collection, I focused on tools which were concerned with Human Computer Interaction. This was because I was concerned with the introduction of technology into an existing classroom setting, and believed that the interaction between teachers and students and the technology itself would be key to tensions and transformation. At this point I intended to use Actor Network Theory (ANT), which views actors as the 'source of an action regardless of its status as a human or non-human' (Doolan and Lowe, 2016, p.90). This radically attributes the same levels of agency to human and inanimate entities. ANT understands society as being made up of networked actors, which in addition to humans and non-humans also includes concepts and ideas – with social processes as being generated by interaction between actors (Latour, 2005). There are some convincing examples of ANT being used to understand the introduction of technology into classrooms in low and middle income countries, notably Lars Bo Anderson's (2013) doctoral study of the One Laptop Per Child programme in Nigeria. In my own research, however, I found two major challenges in using ANT. The first is that ANT insufficiently engages with power and existing hierarchies, believing instead that every interaction between actors created things anew. Whilst the world is a dynamic place, and social processes can result in

unexpected and transformational results, structural inequalities are a pervasive feature of refugee – and many other – settings, and cannot be ignored. The second is that it ascribes similar agency to human and non-human elements of an activity system, which I cannot accept. Here I understand agency as the way actors ‘critically shape their responses to problematic situations’ (Biesta and Tedder, 2006, p.11). Whilst a teacher is using a laptop might be different to one who is not, according to my epistemological position the teacher is the only one with agency.

In looking at the interface between technology and people, theorists such as Kort and Gharbi (2013) focused on the apparent dichotomy between social constructivism and technological determinism: the concept that technology determines social structures over which we have no control. Giddens’ Structuration Theory (1984) was partly a response to this dilemma and provides a revision of constructivism that attributes importance to institutions (both formal and non-formal) as well as to individuals and their interactions. Whilst this partly answered my requirement for a framework in which the different and dynamic nodes – actors, resources, networks and structures – and their relationships could be modelled, critics of Structuration Theory posit that it insufficiently explores the notion of dialogue (Ravenscroft, 2011) and can struggle to understand nuances within dynamic systems. Whilst there is some discussion around the suitability of Structuration Theory for researching education technology (Li, 2016; Halperin, 2016) there is also recognition of the limited amount of such research undertaken to date. I used Structuration Theory more as ‘a sensitization device’ (Archer, 2013, p.xi) for encouraging my exploration of structure and agency together, but chose activity theory as the framework for my own research.

This relationship between humans and the technology they engage with has been a contested area in the field of Human Computer Interaction for decades. Bannon’s seminal (1991) essay sparked a shift in HCI research by arguing that there was a need to understand the multifaceted and contextual aspects of human behaviour and view ‘...the person as an autonomous agent that has the capacity to regulate and coordinate his or her behaviour, rather than being simply a passive element in a human-machine system’ (Bannon, 1991, p. 29). Fundamental to activity theory is the concept that, ‘subjects live in the world; they have needs that can only be met by being and acting in the world’ (Kaptelinin, 2006, p.32). AT focuses on understanding the relationships,

support and tensions across complex strands, making it particularly useful when introducing technology into an existing activity system. It has for some time been utilized in studies of the interaction between humans and technology, such as computer interface design and computer-supported cooperative work (Nardi, 1996). I chose AT because my research requires the ability to understand the relationships, support and tensions across complex social and technological strands. AT is particularly useful when including technology, both as tool, mediator and creation of new community and rules. It has for some time been utilized in studies of the interaction between humans and technology, such as computer interface design and computer-supported cooperative work (Nardi, 1996). There was a significant increase in research studies using AT between 1995-2005 (Engeström, 2009), alongside a general growth in the exploration of technology-enhanced learning. In Murphy and Rodriguez-Manzanares (2008) synthesis of this era of research, they concluded that, 'The lens of AT and contradictions provides a versatile tool to inquire into various aspects of educational technology use, taking into account individual and institutional perspectives as well as evolution over time' (Ibid, 2008, p.442). This resonates with my own constructivist position on human agency, where humans either individually or collectively construct the world through their experiences and mental processes (Young and Colin, 2004). Along with activity theory's tools for engaging with complex power dynamics, this was key to choosing to work with this framework. There is a wide body of contemporary theory and analysis using activity theory (for example, Engeström, 1987; Wertsch, 1981; Gantt and Nardi, 1992; Kaptelinin and Nardi, 1997; Kaptelinin and Nardi, 2006), and a range of studies in education which used AT (for example, Anthony and Clark, 2011; Barnes and Kennewell, 2016; Gedera and Williams, 2016). I was unable to find any research which used activity theory in a school setting in a refugee camp or protracted crisis. Thus I am confident that whilst there is a foundation of research which validates my approach, there is also an opportunity for this study to contribute to a small, but growing, body of literature.

3.2 The evolution of activity theory

Activity theory was conceptualised by Alexei Leontiev, but it grew out of psychological movements in Russia in the 1920s and '30s, starting notably with the work of Vygotsky

(1962, 1978). These movements gave rise to cultural-historical psychology (Bakhurst, 1991; Kaptelinin and Nardi, 2006), in which social activities were the main object of research. In its own 'cultural-historical' setting, the Marxist backdrop to the development of this school of psychology gave a focus on explaining the relationship between the mind, and society. For the first time, there were explanations that considered that the human mind is created generatively by culture, society and external influences.

Leontiev, a student of Vygotsky, built on cultural-historical psychology, and the overall set of theories is sometimes known as Cultural Historical Activity Theory. He built significantly not just on Vygotsky, but on others such as Basov (Kaptelinin, 2005, p.174), whose work in the 1920s developed the position of activity as an equation between the person, the environment and the activity (Basov, 1930). These different influences were brought together by Leontiev (1978) to generate the basic tenets of activity theory:

- No properties of either the subject or the object exist before the activity – it is the activity which shapes them both;
- Activity is therefore the key source of development for both subject and object, and activity may create substantial changes to both;
- Activity is fundamentally given meaning through object-orientedness, and this 'means anchoring and contextualising subjective phenomena in the objective world' (Kaptelinin and Nardi, 2006, p.137).

Unlike the Finnish school, the Russian school's focus on the theory evolved into Cultural Historical Activity theory, or CHAT. Whilst I do not follow CHAT, given its focus on individuals (Yamagata-Lynch, 2010) AT itself views all activity systems as culturally mediated (Prasolova-Forland and Divinti, 2003). With the collective model which is thus mediated, being part of an activity system has impacts on both the subject and the tools and systems themselves (Kuutti, 1995; Peachey, 2010). Indeed, 'the culture and the use of a tool act together to determine the way practitioners see the world; and the way the world appears to them determines the culture's understanding of the world and of the tools' (de Freitas and Jameson, 2012, p.213). As my research concerns the introduction of new tools into an existing system, the review of tools is a particular focus.

3.3 Applications of Activity Theory in similar research

There is a body of research which uses activity theory to research classroom settings, including the introduction of technology. A significant strand of this considers the experience of teachers and students in higher education (Benson et al., 2008; Price and Oliver, 2007; Bradey, 2014) but these were discounted as being outside of my research boundary. In discussing their use of AT as the lens through which to explore the integration of technology into classroom practice, researchers (Lim and Hang, 2003; Dobson et al., 2004) argue that the ability of AT to facilitate looking at multiple, overlapping systems gives greater insights not just to the 'most obvious user' (Dobson et al., 2004, ¶ 5). The majority of other studies reflected the benefits of being able to find contradictions within and between systems. Activity theory has also been used in recent doctoral theses: the majority of these focus on higher education (Sirisatit, 2010; Browne, 2011) or on the experience of teachers and students in high income countries (Baxley, 2017; Hendry, 2016; Thorgeirsdottir, 2015). There are doctoral studies of technology in education, but again with a focus on university level (Churchill, 2011; Bradey, 2014).

Peer reviewed research fell into three broad categories: teacher engagement with technology in schools; teacher school engagement (without technology); and activity theory as a way of creating tools and frameworks to understand engagement with technology in education settings. Overall, these showed that there is both foundation and potential for activity theory in working on these themes, and particularly in considering where contradictions and transformations happen in systems when technology is introduced.

Anthony and Clark (2011) explored teachers' dilemmas of practice including (a) determining the role of technology, (b) meeting misaligned expectations, and (c) gaining knowledge and skills despite limited professional development. Activity theory was used to identify where these dilemmas were situated, for example a tension between 'tools' where teachers were expected to add technological tools to their work, and 'rules and norms' where they felt constrained to continue to teach in ways which did not facilitate the inclusion of new tools. The study investigated coping strategies, and whether these started to create new 'rules'. Lim and Hang (2003) focused on the

integration of technology and the extent to which ICT has been integrated into schools in Singapore, both socio-culturally and pedagogically, and also explored transformation in the classroom and, in particular, the creation of new norms. Their study looked at changes into the classroom setting with the introduction of technology and how this influenced both the wider relationships between nodes across the school activity system, and beyond. Barnes and Kennewell (2016) also looked at the impact of and on the wider context. Their study in primary schools in Wales considered how to investigate the teaching of ICT as an activity system. They identified contradictions and tensions within the teaching of and with ICT, including with the curriculum, the changing roles of the participants and the organisational culture of the school as an overarching activity system. Hardman, J. (2005) conducted research in primary schools in South Africa, exploring specifically whether the introduction of new technologies contributes to the creation of new pedagogies. This reviewed shifts in teacher practice following the introduction of technology into the existing activity system of the school, and focused on contradictions as drivers of change. Hardman concludes that transformations in the teaching of one subject brought about by integrating ICT can also bring transformation in other aspects of the classroom. Together, these studies point to the ability of activity theory to consider how people and communities transform, and are transformed by, new interventions.

There are a number of studies which use activity theory to investigate teacher perspectives in classroom settings without technology. Page and Clark (2010) undertook a qualitative study exploring how teachers incorporate the affective domain into the primary mathematics classroom. They analysed teacher's experiences of mathematics and explored how these prior experiences, and the teachers' perception of them, impacted their teaching. Similarly, Russell and Schneiderheinze (2005) conducted a study into the establishment and integration of non-technology innovations into constructivist learning environments. The study built pictures of individual teachers' activity systems and looked at tensions across both individual and school level systems, and how they relate to each other. Both these papers used activity theory to engage with teachers' individual activity systems (personal beliefs, experiences and context) and

how these impacted on their role within the collective activity system and engagement with new tools.

Activity theory has also been used to understand how interventions and new approaches can create new activities or ways of interacting. Blin (2004) researched higher education settings with the aim of creating a research framework for use in studying Computer Assisted Language Learning (CALL) with the aim of capturing the rich and varied interactions that happen during autonomous learning. This included exploring how students created new tools and rules as the activity system of computer-aided learning developed. Mwanza-Simwami et al. (2009) created abstracted theory-informed guidelines based on activity theory. These were then used as a foundation to create a methodology for evaluating international higher education learners and their dynamic activities and individual experiences in learning with technology. Similarly, Barab et al. (2004) studied an online community of in-service and preservice STEM teachers who were sharing and creating pedagogical practices and materials and supporting one another. They used activity theory to consider the design and management of such online communities, looking at how the relationships between elements differed from in-person and online communities, and how new 'rules' and 'divisions of labour' were created amongst the group. Whilst these studies focused on higher education and on distance or blended learning, they are useful in understanding how activity theory can facilitate the development of frameworks in which to explore interactions in multiple communities.

3.4 Criticisms and limitations of activity theory

As with all theories, activity theory is contested. One of the benefits of activity theory is that, with the focus on the activity system as the unit of analysis, the model can be made to fit most phenomena. Martin and Peim (2009) however see this as a weakness, and consider that this only applies to linear approaches which have anticipated results. Bakhurst (2009) goes further and suggests that activity theory is only plausible within linear systems. This relates to criticisms that it is too weak to be considered a theory, specifically that there is a lack of methods or operations around it (Rogers, 2004). Activity theory is criticised as being too focused on observable activity rather than processes of emotion or reasoning, for example (Yamagata-Lynch, 2010; Roth and Lee,

2007). Others found that there were sufficient analytical tools guided by activity theory, with a focus on 'asking the right questions' (Quek and Shah, 2004).

Bakhurst (2009) argues that the development of activity theory by Engström in particular has moved unrecognisably far away from its philosophical roots: 'While [Leontiev] saw the concept of activity as a fundamental category to address profound philosophical questions about the possibility of mind, activity theory in the West has principally become an empirical method for modelling activity systems' (Bakhurst, 2009:, p.197). A fundamental challenge to activity theory is whether this move has lost the transformational potential of its early roots. The strength of activity theory in focusing on detailed, localised activities also generates the greatest limitations in understanding structural and macro-level practices. When these position individuals in particular ways, especially in relation to use of tools and division of labour, analysis of micro-level activity systems may minimize these (Edwards and Daniels, 2004; Martin and Peim 2009). Constructs which have political implications in macro-social structures such as race, gender or class can therefore be subordinated into activity systems analysis, and individual practices or experiences risk being seen only as expressions of the system under scrutiny (McNicholl and Blake, 2013; Hartley, 2009; Langemeyer and Roth, 2006). A result of this is the challenge in recognising and interpreting the interplay of power within and between systems, where even champions of activity theory (Yamagata-Lynch, 2010) note that this is partly because the challenge of analysing multiple concurrent and interrelated systems at multiple levels can become overwhelming.

I found these challenges in my own analysis of R. Engström¹ et al.'s (2014) recent work around Development Work Research (DWR), which is based on the application of activity theory to the design of education interventions in Botswana. It is only at the end of their research that the authors posit that analysing policy, social structures and 'what comes from the top' should be taken into consideration in DWR, including 'analyzing the relationship between the new learning activity and the organizational vision of policymakers (R. Engeström et al., 2014, p.143). In his critique of the DWR approach,

¹ The initial here is used throughout this study to differentiate this author from Y. Engeström who is cited throughout with no initial.

Serpell (2014) notes that taking highly critical viewpoints on what are existing social norms is to misunderstand the context, and will lead to the design of projects which fail. I believe though that both these positions miss that the structural politics, both politics of representation and macro-structures, both create and are created by individual practices. Social norms which are reflected in individual practices are likely to be reflected in policy. It also fails to recognise that – certainly in education – policy does not just exist ‘at the top’ but is part of the lived reality of teachers, students and families. Policies which influence teacher salary or mobility have an impact on the daily lives of teachers which will impact on how they interact with students, for example. I will agree with R. Engeström et al. (2014) that ‘these concealed conflicts undermine teachers’ daily work and need to be taken into account’ (2014, p.143) and much of this thesis is an exploration of those conflicts. Throughout this study, then, I have kept in focus Bakhurst’s position that in order to avoid this ambiguity the researcher needs to engage fully with the system to ‘see how things look from the perspective of the various agents, and to sense the forces that influence their perceptions and their actions’ (2009, p.207). I also try to follow his guideline to remain self-critical and reflective.

3.5 Unit of analysis: the activity system

‘In simple terms, activity theory is all about ‘who is doing what, why and how’ (Hasan and Kazlauskas, 2014, p.9). The basic unit of analysis is *object-oriented activity*: purposeful interaction between subject and object. In my research this is between teachers (the subject of the study) and students (the object of the teachers’ activity). This interaction is mediated by tools or artefacts: both physical, such as computers, hammers or pens; and mental, such as blueprints or maps (Kaptelinin and Nardi, 2006). This mediational model of human behaviour built on the behaviourist approach, envisaging a triangular relationship between the subject, object, and cultural tools through which experience is mediated (Vygotsky, 1981). Leontiev (1978) first imagined this as a triangular relationship between subject-tool-object, and Engeström (1987) extended this and developed the activity system model to show how the relationship is influenced and mediated by community, rules and norms, and division of labour. Engeström (1991) created a visual model of this activity system (Figure 5, below), and this ‘activity triangle’ is used in my research to map the elements of the activity systems studied, and the relationships between them:

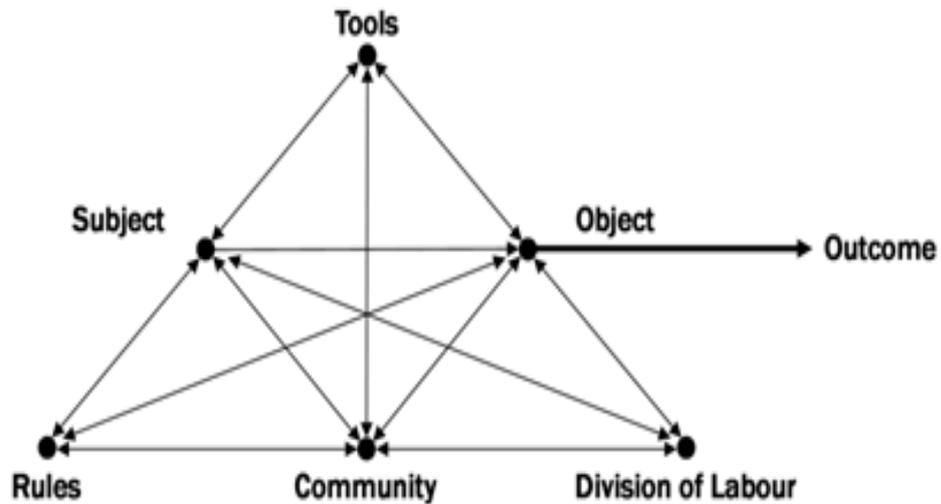


Figure 5: the activity system: developed from Engström, 1991: Meyers, 2007.

This is the second generation of this model (Engeström 1987/1999), which Russell (2002, p.67) describes as capturing a ‘functional system of social/cultural interactions that constitutes behaviour and produces that kind of change called learning’ (original emphasis). Activity theorists call the different parts of the model ‘nodes’, and a wide body of AT research focuses on the use of this model to investigate relationships and tensions between nodes (Gedera and Williams, 2016). In later years, Engeström and the Finnish School of activity theory extended the model to include representations of multiple activity systems and their relationships, including the hierarchical structure of power and scope (Engeström, 2001; Guy, 2005) saying, ‘It is not easy to depict and analyse hierarchical power relations in a single activity system’ (Engeström, 1996, p.307). This revised structure of the activity model presents the whole system, with the multiplicity of nodes, connections and relationships therein (Engeström, 1987, p.78). Each corner of the triangle should also show the hierarchy of activity, mapping the levels of the subject as operation (non-conscious), action (individual subject) and activity (collective subject) (Engeström, 1996, p.260).

The sections below describe each of the nodes, using both literature about activity theory and examples of studies which used it.

Subject

Activity theory views the subject as the perspective from which the activity system is constructed: ‘The ‘who’ of the activity system’ (Wuori, 2009, p.37). Within the idea of

'who' is the position that not all entities can be subjects. AT is based on the concept that, 'Subjects live in the world; they have needs that can only be met by being and acting in the world' (Kaptelinin, 2006, p.32). In the literature, the subject of classroom-focused activity theory studies tended to define the subject as students (Jurdak, 2006; Zurita and Nussbaum, 2007); teachers, educators or education researchers (Hardman, 2007; Jaworski, 2003). This research takes teachers as the subject, and my interview-based research design took Kvale's (1996, p.27) position that 'the purpose of qualitative research interview[ing]...is to understand the themes of the lived daily world from the subjects' own perspectives', and the use of the analytical tools of activity theory were intended to generate as deep an understanding as possible about the respondents' context, environment and perceptions.

Object

'The object of activity can be considered the 'ultimate reason' behind various behaviours of individuals, groups, or organizations. In other words, the object of activity can be defined as 'the sense-maker', which gives meaning to and determines values of various entities and phenomena' (Kaptelinin, 2006, p.5). Whilst the idea of 'object oriented activity' is common – where people are working together for the same purpose though their motivations might differ – how to define the 'object' itself is one of the disputed elements of the activity system. Leontiev (1978) viewed objects as individuals (usually people), even if the activity system was collaborative. This was partly due to his contextual foundation in psychology, and his focus on people's actions. Engström's approach to the object was that human activities are fundamentally geared towards something, towards change, and that this object can be collective as well as individual. One of the key positions of object in the activity system is the motive or purpose of activity (Wuori, 2009; Nardi, 1996; Sannino et al., 2009).

In the AT literature reviewed above, the object was either long term changes to students if the object was teachers (Hardman, 2007; Jaworski, 2003); or more specific goals if the subject was students (Zurita and Nussbaum, 2007; Zahner, 2015). My research initially proposed student learning outcomes as the object, but through exploring my findings with activity theory, I found that 'learning outcomes' were not the common motivation. Rather, this was improving life chances for students.

Therefore 'students' are the overall object, with the long and short term goals expressed as 'objectives' or 'outcomes'.

Tools

Tools are defined as 'the 'how' of the activity system' (Wuori, 2009, p.37), or the things through which human mental functioning are mediated (Lantolf et al. 2015, p.207). In activity theory, tools are often viewed as the bridge between the subject and object, and these three aspects were the initial trinity in the first phase of the AT triangle. By viewing tools as that which 'mediates between the individual (the subject of activity) and the individuals' purpose (the object of the activity)' (Bellamy, 1996, p.124), the findings section of this thesis will note the different things which respondents reported mediated their subject-object dialectic.

Activity theorists diverge as to the use of the words 'tool' and 'artefact' but this seems to be based on preference rather than debate. Socio-cultural traditions within AT define 'tool' as 'any kind of cultural artefact that humans have invented to expand physical or cognitive capabilities' (Francis, 2010, p.24). Two kinds of tools are found in the literature. Physical tools, especially instruments or materials such as computers, hardware or software, or other resources are commonly the tools in AT studies of the classroom (Coupland and Crawford, 2006). Psychological tools, which are ascribed to higher mental functions and are unique to humans, included new concepts, language, maps and strategies (Jurdak, 2006). Psychological tools are central to Vygotsky's work, relating to humans' symbolic systems which can be an internalisation of 'maps' or processes which make processes more automatic. Regardless of the types of tools, 'human beings seldom interact with the world directly. An enormous number of artefacts have been developed by humankind to mediate our relationships with the world' (Kaptelinin and Nardi, 2006, p.42).

Community

Communities are 'multiple individuals and/or sub-groups who share the same general object and who construct themselves as distinct from other communities' (Klokmoose and Zander, 2010, p.124). Yamagata-Lynch describes community in activity theory as 'the social group that the subject belongs to whilst engaged in the activity' (Yamagata-Lynch, 2010, p.2).

Burbules and Torres (2000) posit that there are three conditions which create different types of community:

- Mediating conditions (media, forms of interaction, social practices);
- Political conditions (constructs such as nation, family and religion); and
- Conditions of place and space (public and private space).

Communities based on all of these three contexts or interactions, including where they intersect, are considered in this section. Communities in the literature tended to be either the classroom setting (teachers plus students, such as in Jurdak, 2006); or meso-level settings of the school as a whole or with the community of parents and wider local community attached (Jaworski and Potari, 2009).

In my research, there are many layers of community at the level of individual teachers, schools, the camp as a whole, and the global community of Instant Network Schools. These include the local population such as parents, community and religious leaders; the implementing partners and UN bodies who are engaged with management; the community that refugees left behind when fleeing their home countries; and the host communities locally in Kenya.

Division of Labour

Nardi defines this node in the activity system as being central to understanding collective action, where,

...the community's relationship to the object of the activity is mediated by the division of labor [sic] – how the activity is distributed among the members of the community, that is, the role that each individual in the community plays in the activity, the power each wields, and the tasks each is held responsible for. This last relationship occurs because in order for a community to achieve a common objective, the activities of the individuals in it must be organized, and the paths of communication coordinated, so that together they form the set of actions that will achieve the common objective. (Nardi,1996, p.125)

Yamagata-Lynch defines this more simply as 'how the tasks are shared amongst the community' (2010, p.2) and in her own studies uses this element to list the different tasks and identify tensions where specific roles are not played. Of central importance here is the concept of distribution, and of allocated responsibility and power.

Division of labour relates closely to the concept of community (who is involved) and rules (how is responsibility and power decided), in making a collective activity system work towards common objectives. The majority of literature (Jaworski and Potari, 2009; Jurdak, 2006; Hardman, 2007) considered the division of labour in relation to management, power and the sharing and undertaking of classroom tasks.

Rules

Within any activity system, rules are explicit and implicit regulations, norms and conventions, which are socially constructed and understood (Cole and Engström, 1997; Terratino, 2009). There are different types of rules which can be both explicit or external, and implicit or mutually understood social norms. Rules affect the way the activity takes place, and that way that the subjects reach their objective. Some rules are organic, and in a situation such as a refugee camp where social structures are dynamic rules and social norms can shift. The literature also found examples where there were tensions with macro-level rules which are imposed on the microcosm of the classroom. An example of this is the use of English as a mandatory medium in the classroom setting which may be a rule which has a particular impact on a group of minority students (Jurdak,2006).

3.6 The activity system within my research

Based on these descriptions of the categories in AT, I modelled a baseline activity system which included key 'standard' elements within a school setting (below, figure 6). I used this to build on with the data from my own research, which is shown on p.117.

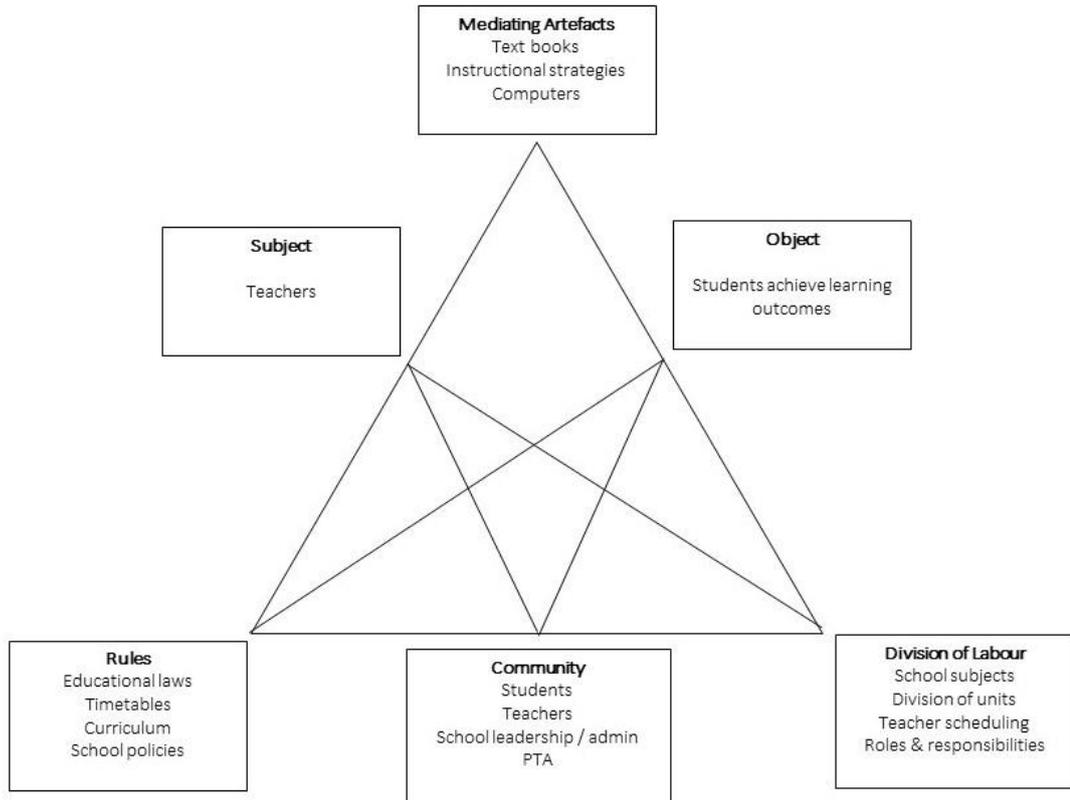


Figure 6: the Activity Theory model of 'standard' elements within a school setting

3.7 Theorizing activity systems and contradictions

Finding contradictions within and between systems is a key aim of activity theory.

Engeström (2016) argues that,

Qualitative change and development in activity systems, including schools and other educational organisations, is driven by contradictions... Contradictions are historically accumulating systemic tensions that cannot be observed directly. Only their manifestations, such as disturbances and conflicts, are observable in the daily flow of actions. That is why the examination of contradictions requires historical analysis. Hypotheses generated by historical analysis can then be tested and enriched with data on disturbances and conflicts experienced and articulated by practitioners.

(Engeström, in Gedara and Williams, 2016, p.vii)

Engeström had earlier (1987) created a typology of four kinds of contradictions, and later iterations of activity theory include exploring contradictions between activity

systems (Nuñez, 2009; Virkkunen and Kuutti, 2000). Looking at these wider contradictions also encourages the consideration of the context of an activity system. Some researchers articulate these as ‘nested activity systems’ (Lim and Hang, 2003; Nuñez, 2009) where the activity system being studied is situated within the meso and macro level systems. Whilst Nuñez (2009) presents a graphic of this as concentric circles around an activity system, I find this to be an insubstantial representation of the complexity of each system or the interplay of power between systems and components. Interrogating nested systems can generate important findings about the impact of macro-level policies and approaches on individual teachers and students (Jaworski and Potari, 2009; Roth, 2011) which is particularly important when looking at the experiences of minority or vulnerable individuals within the system (Zahner, 2015; Guitierrez, 2008). Within my own research, this exploration was also able to highlight apparent tensions within the activity system of the school, which are microcosms of contradictions at a much higher level. This presents an opportunity to design programmes which mitigate these tensions, and to contribute to the wider policy level debate on refugee education. The exploration of contradictions is further discussed in the Discussion Chapter on pp. 148-163.

3.8 Chapter Summary

This chapter has presented a literature review of activity theory. This began with a summary of the possible conceptual frameworks I considered and a summary of why I selected activity theory, including a critical reflection on criticisms. It then goes on to review research conducted using activity theory, both in education and more widely, and explores the gap in the literature that this study fills, as there were no examples of using activity theory to study education in refugee contexts. Next, I explored the different nodes of the activity system, using the literature to build a clear picture of each. Finally, I presented both the activity theory model of my own research context, and the importance of understanding contradictions and tensions.

Chapter 4: Methodology and Research Design

This chapter sets out my research design, methodological approach, and the process and challenges of implementation. Firstly, I will establish the conceptual frameworks which act as the foundation in which my research emerged, exploring my interpretivist approach and the use of Activity Theory as a structure to support the collection and analysis of data concerning teachers' perception and activities. The theoretical framework, exploring belief systems and approaches, will be outlined in the literature review. The main body of this chapter focuses on the research study, exploring how the data was gathered, organised and analysed which is then reviewed in relation to ethical considerations. Finally, I explore the limits of the study, establishing the foundation of the next chapter which presents and analyses the findings of the main study.

My data collection took place during an 18-month period as follows:

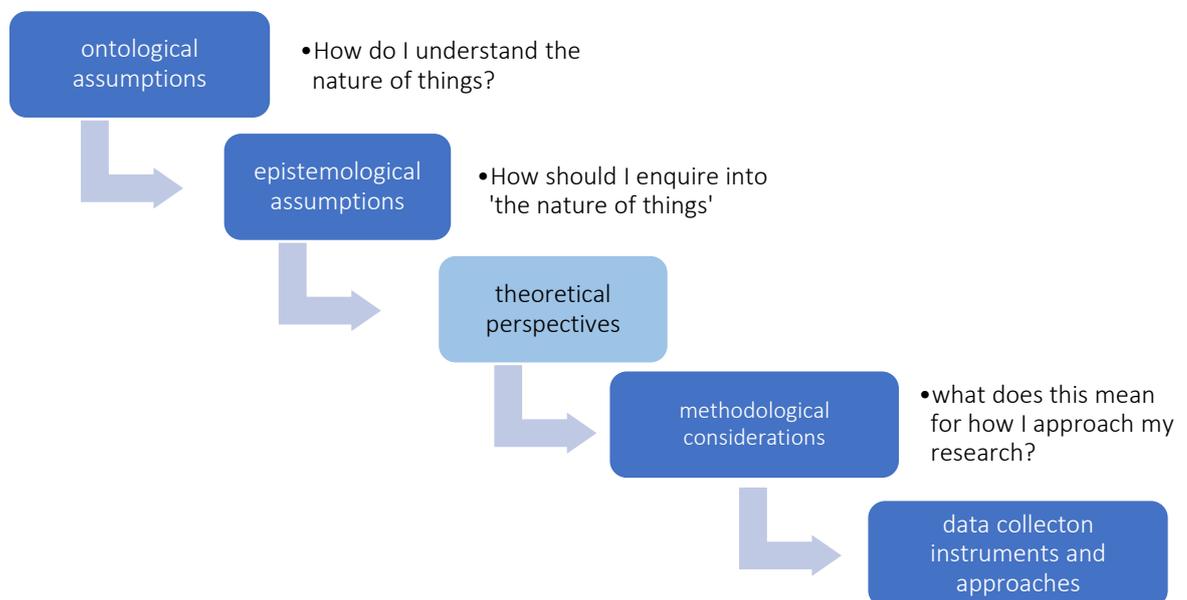
Phase	School year	Research Activity
Pre-pilot	2014-2015	September 2014 – March 2015 Engagement with schools; building relationships and trust; school observation; document collection
Pilot		April 2015 – September 2015 Conducting pilot study through to the submission of revised research design for the main study
Main study	2015-16	September 2015-March 2016 Four main visits including interviews: September and November 2015, and January and March 2016. Collecting secondary data; observing schools and meetings.

Table 1: timeline of field research

4.1 Conceptual Framework: interpretivism and qualitative approaches in education

This section will outline my underlying interpretivist research paradigm and what these mean for the research design. This is further developed into my conceptual framework where, 'A conceptual framework explains... the main things to be studied – the key factors, variables and constructs – and the presumed interaction between them' (Miles, Huberman and Saldaña, 2014, p.20). Hitchcock and Hughes (1995) view conceptual frameworks as the multi-layered assumptions which are the foundation of a

researcher's position. Firstly, this is informed by ontological assumption, or the suppositions about the nature of the social phenomena being explored. In the case of most educational research including mine, this relates to people and social reality. Onto this is layered epistemological assumption, or how the researcher views the nature of knowledge of these social phenomena, such as 'learning', and how this can be explored and communicated. Between them, these assumptions suggest methodological considerations, which in turn are focused down into a specific set of research tools and approaches. Crotty (1998) maps the relationship in a similar approach, but includes 'theoretical perspectives' between epistemological approaches and methodologies:



Underpinning my research is an interpretivist theoretical framework and the assumption that each person experiences the world differently; and that by understanding individual experiences of phenomena we can better understand both people and the phenomena (Dewey, 1938; Piaget, 1954; Vygotsky, 1978). This essential understanding of 'the nature of things' requires subjective epistemological approaches to research. Such approaches value individual and collective experience of the phenomena to be explored. I am intrinsically guided by a social justice approach (Sen, 2009; Nussbaum, 2003; Tikly and Barrett, 2011) to education, which places equal value on the agency and experiences of different individuals. As a researcher into education in crises I also take a simple baseline understanding, that, regardless of our ability to

quantify the value of education against proxy indicators for peace or development, education has an inherent value.

Within this paradigm, I take the following model of learning: that people learn through the process of active construction (Duffy and Jonassen, 1992; Mascolol and Fischer, 2005). This model requires an understanding of relationships within an education context (Perraton, 1998; Piaget, 1954; Siemens, 2004) focusing on supporting learners (including teachers who are learning new skills) to construct knowledge based on their own social experiences and interactions. Indeed, I believe that this idea that learning is socially constructed is useful in understanding the possible approaches and processes of change in introducing technology into education, particularly in complex and challenging settings such as refugee camps. Unwin (2009, p.207) notes that in order for technology to have an impact on teacher practice, it must be sited within an educational model that supports a constructivist view of pedagogy. Sense-making and ownership are seen as key aspects of teacher perception of new resources and practice (Ketelaar et al, 2012; Spillane et al, 2002), and contextualise it for themselves:

When teachers are confronted with an educational innovation, they make sense of it in the light of their own knowledge, beliefs and experiences, the situation in which they find themselves, and the design and message of the policy for implementing the innovation. (Ketelaar et al, 2012, p.274)

With this foundation, I take a qualitative approach to my research. In exploring their own qualitative angle, Hitchcock and Hughes (1995) posit that, 'A qualitative research orientation places individual actors at its centre, it will focus upon context, meaning, culture, history and biography' (1995, p.25). They note that by doing so, the complexities, connections and context of teacher and school practice can be better understood. With my research clearly situated, therefore, within an interpretivist paradigm, and the overall methodological approach being qualitative, the rest of this chapter will outline the research design and tools, and outline and reflect on the implementation of these.

My research requires a set of tools to work with, in which complex social relationships and interactions can be explored. Activity theory (AT) aims to facilitate the mapping of such relationships and the gaps or tensions between them, and has been

utilized across the field of education. AT is useful in understanding that the primary unit of analysis is activity: 'a purposeful interaction between subject and object, in a process in which mutual transformations are accomplished' (Russell, 2002, p.46). These activities are mediated by 'tools', either mental or resources, and are boundaried by rules, communities and divisions of labour (Engeström, 2001). In the literature review, key concepts are outlined in teacher take up of new practices, in particular technologies. Vygotsky's (1933/1978) mediational model built on the behaviourist approach, modelling a triangular relationship between the subject, object, and cultural tools through which experience is mediated. Engeström (1987/1999) further developed this into the activity theory triangle with a focus on interactions between groups which generate structural transformations. Using this model provides an approach to understanding education and learning as having cultural and social aspects, and to generating a map of how they work both at a single point in time, and over a period of time (Pearson, 2009). There is also a position that activity theory is especially useful in cross-cultural research in education because it offers ways of exploring power, social norms and culture which may not otherwise be explicitly explored (Lee, 2011). The selection and relevance of AT has been further explored in Chapter 3.

4.2 Programme Intervention: the methodology of the Instant Network Schools programme

My research focuses on one educational technology intervention, the Instant Network Schools programme. This is run by the Vodafone Foundation, the international corporate social responsibility body of the telecom company Vodafone, and UNHCR, the United Nations body globally mandated to manage refugee camps. UNHCR (2015b) note that the programme was co-designed by the two organisations to address significant challenges:

In September 2013, the Vodafone Foundation approached UNHCR and its partners in Dadaab, Kenya, with a provocative question: How could mobile technology be leveraged to improve the quality of education in the world's largest refugee settlement? (UNHCR, 2015b, ¶13)

In 2015, Dadaab was the first site for implementation of the programme and aimed to work in 13 schools and vocational centres across the camp. Whilst later roll out of the intervention into other locations utilised Human Centred Design (UNHCR, 2015c) and engaged refugee communities themselves, the Dadaab pilot was designed only by the two organisations. Vodafone Foundation funded a Project Manager to be based in the camp, responsible for trouble-shooting the INS set up in schools and also for project monitoring. The technology resources of the Instant Network Schools programme are described on pp.13-14, but here I will outline the human resource aspects and in particular areas where the design of the programme was not fully realised in the implementation.

INS was designed to work within existing structures, by putting additional support into schools. This required the engagement of teaching and school administration staff in both the set up and the day to day management. The programme was designed with the idea that one teacher in each school would be nominated as a Coach whose responsibilities would be similar to a Lab Technician, or librarian. They would manage and monitor use of the hardware, find and curate relevant digital content, and train and support teachers across the school to use the INS in their daily class work. The role of the Coach remained contentious throughout the programme and was an issue raised in all the meetings I attended as part of my data collection. Vodafone Foundation had understood that the implementing partners managing the schools would nominate the Coach and free that person from their regular teaching load. However, restrictions on budgets and movement of teachers meant that this did not happen, and Coaches were forced to play two roles. This led to tensions between the partners, and insufficient resourcing at school level. Another tension between the design and implementation was around who had responsibility for monitoring the programme. In addition to the data paucity in Dadaab (see pp.12-13), there were a number of challenges in gathering regular data about the use of the INS Classroom in each school. In my observation, this was partly due to a lack of clarity about the role of both the Project Manager and the Coaches, where neither felt motivated to collect and share regular data.

4.3 The pilot study

In order to test the research design, I conducted a pilot research project. My initial research design aimed to assess the overall impact of the INS programme on both teachers and students, reviewing changes to learning outcomes and to psychosocial wellbeing using a range of indicators. As the pilot showed, this was far too broad, and the approach was significantly revised before the main study was conducted with a focus on teacher perception of the programme.

Challenges in aligning the philosophical position with the methodology and approach were another obstacle in the pilot research, and one of the reasons for the revision. The initial pilot focused on using a mixture of methodologies whereby the results of qualitative primary data collected from key informants would be analysed with quantitative secondary macro-data such as school enrolment and attendance. I viewed this not as a 'mixed methods' approach in terms of a research paradigm (Johnson et al., 2007) but rather a research approach, used with caution (Oliver et al., 2005). I took as a position one of Tashakkori and Teddlie's (2008) seven purposes for 'mixing methodologies': the need for *completeness*, particularly in regard to triangulation: where, for example, teachers self-report improved learning outcomes by children to classes which include ICT, exam data was to be used to assess whether their perception is reflected in quantified activity such as exam results. The pilot study itself, however, showed that the methods were in fact too mixed, too ambitious and grounded in inappropriate theory. They also relied on secondary data which is not reliably collected.

Pilot Study Research Design

There were three research questions in the original research design:

1. What is the impact of introducing ICT on teacher quality?
2. What is the impact of introducing ICT on teacher self-concept?
3. What is the impact of introducing ICT on learning outcomes?

The pilot focused on the second question, 'what is the impact of introducing ICT on teacher self-concept?' and aimed to test the self-concept constructs alongside conducting semi-structured interviews, one focus group discussion and the online

forms. Data was collected during an intense one-week pilot research trip to Dadaab in April 2015. There were four main activities:

1. A discussion with the Coaches on the research so they were able to give informed consent;
2. An initial focus group discussion on the characteristics of a good teacher and any challenges respondents face in modelling these characteristics in their work with the Instant Classroom programme;
3. A group testing of the questionnaire around the constructs I had identified around teacher self-concept to test these and how they may need to be revised;
4. Five semi-structured interviews with Coaches in order to generate thick description to better understand the context of the answers generated by activities 2 and 3.

For the group work with Coaches, all 30 were invited to attend. 13 chose to come – almost 45% of the total number of Coaches. Those who attended represented both the national and incentive teachers, and this element of teacher background was a key factor when analysing data. Of the five semi-structured interviews, all these were conducted with Kenyan national teachers who were recommended by implementing partners who wanted the ‘best’ teachers to be interviewed. By presenting the ‘best’ teachers, or working with only those who are self-motivated enough to attend a workshop, the sampling was clearly biased, and was a key change for the main study.

A questionnaire was undertaken with the same group of 13 Coaches and is one aspect of the original research design which has been excluded rather than revised. Whilst the intention had been to test a questionnaire that had been developed for teachers to undertake individually, this exercise asked them to answer as individuals but in a group setting, and to jointly reflect on the exercise. The Coaches were asked to respond to ten statements on teacher self-concept using a Likert scale through a physical grading exercise of stones and cups. Coaches were also advised that they did not have to score themselves on any individual question if they felt they did not want to, for whatever reason. The questionnaire was unsuccessful in answering the research questions, and did not generate data which I could analyse fully. In addition, tests on getting Coaches to fill out online questionnaires themselves – tested during January-

May 2015 as part of a wider monitoring intervention – showed an uptake of zero, even with the additional support of programme staff. Discussions with the programme teams and Coaches (field notes, February 2015 and May 2015) showed that this was partly due to lack of internet in some of the schools; a lack of motivation amongst Coaches who felt that they were already required to do additional work in the INS and would not take on extra regular reporting without financial reward; and lack of capacity in using online forms. Thus the use of an online questionnaire was deemed unworkable, something which in itself suggests information about how teachers engage with the technology-based tools within the programme.

There was also insufficient exploration of what constitutes both ‘teacher quality’ and ‘learning outcomes’. Whilst the literature review looked at what constituted school effectiveness, unpacking either of these concepts in Dadaab would constitute a research project in itself. These discussions did, however, help to identify the contradictions in the INS activity system around epistemology and object. For all the questions and for the overall research premise, the focus was too broad and aimed to make connections between such multi-factored elements that conclusions would have been false. Whilst the pilot research generated some interesting results for discussion and consideration, the main finding was that this research design was not fit for purpose. For research to be meaningful, there must be quality control on both the data collection and analysis. The pilot research showed a lack of quality control on the data collection, particularly around construct validity, which is ‘the degree to which a test measures what it claims, or purports, to be measuring’ (Brown, 1996, p.231). In this instance, the test measurements were not relatable to the research questions, which is partly due to a lack of clear focus in those original questions.

Following on from the pilot study then, the research questions were narrowed in focus to become ‘answerable’, and the research tools were revised and simplified to focus only on semi-structured interviews with teachers. The sample was more purposefully directed to include respondents with different roles within the INS and the schools, and to focus on including more incentive teachers who are refugees themselves. Whilst a document analysis continued to be included to generate a rich

picture of Dadaab, the focus on teacher perception rather than quantifiable changes meant that the type of documents and the purpose also changed.

4.4 The Main Study

This section focuses on the research design of the main study: the planning and implementation processes of gathering, organising and analysing the data.

Research Questions

My research focused on the overall question:

What are the teacher perceptions of their engagement in the Instant Network Schools programme in Dadaab refugee camp? The intention was to investigate these through the following subsidiary questions:

1. What do they perceive to be the benefits of their involvement in the programme on their teaching and learning?
2. What is the impact on teacher motivation?
3. What do they perceive as the benefits to students?
4. What do they perceive to be the constraints or barriers to their optimal use of the programme to support teaching and learning?
5. What are the development needs for optimal impact of the programme? (i) At the level of the individual teacher (ii) For professional development activities and opportunities, and (iii) For modifications to the programme design?

Originally, the research had planned to include the question 'How do these perceptions change over time?' Whilst the study is situated over an eighteen-month period (September 2014-March 2016) the refugee population is so dynamic that I was unable to interview the same people twice. Whilst this is a study overtime it cannot be considered longitudinal, or to assess changes in individual teacher perceptions. Therefore this question is not considered as part of the study.

A descriptive case study approach: resonance and the lived reality

This research presents a case study of the perception of teachers who are engaged with the Instant Network Schools programme in Dadaab refugee camp in Kenya. I have chosen a case study in line with my epistemological framework to be able to 'explain how and why [things] happened by looking in some detail at the interrelationships and

inner workings of the case' (Thomas and Mohan, 2007, p. 313). This gives an opportunity to probe multiple aspects (pedagogical, social, political, technological and personal) and their intersection. Case studies are 'particularly compatible' with the theoretical framing, intent and analytical approach of activity theory (Yamagata-Lynch, 2010, p.63). Yin (1994) considered that a key benefit of the approach is the ability to understand complex contextualised information, saying 'you would use the case study method because you deliberately wanted to cover contextual conditions – believing that they might be highly pertinent to your phenomenon of study' (Yin, 1994, p.13). The emphasis on the potential to 'retain more of the 'noise' of real life than many other types of research' (Hodkinson and Hodkinson, 2001, p.3) reflects both my theoretical approach and the nature of school life and teacher practice, especially in the context of Dadaab where teachers' lived reality is complex and multi-faceted.

Yin (2009) developed the idea of three types of case study research in education: exploratory, in which data is collected and the researcher looks for patterns; descriptive, in which data is considered within a theoretical framework with research questions; and explanatory, where the two processes are pulled together in a search for meaning within a context (Hamilton and Corbett-Whittier, 2013). Whilst Yin's focus on individual case studies and quasi-scientific approach to validity mean that his position is less applicable to my own research in education, his approach is echoed in Merriam's (1998) outline of three types of education case study, with the intersection being 'descriptive'. She also presents a typology of 'intent' within case studies, where the aim of undertaking 'descriptive', 'interpretive' or 'evaluative' studies will suggest the research methods (Merriam, 1998, pp.38-9). Where my intent is interpretive, I use the term 'descriptive case study' to encompass my approach to data collection and thick description.

Stake (1995) views case studies less as a method and more a process of drawing a boundary in research. He also suggests that the complexity and uniqueness that creates the situation in which a case study is appropriate also means that every researcher themselves creates a fresh definition. Thomas (2007) echoes this, noting that 'the use of case studies is more like a framework for investigation rather than a specific method', (Thomas, 2007, p. 301). Stake's summary of the creation of a case

study resonates with me, as my research explores lives and contexts which are often undocumented and ignored:

Finishing a case study is the consummation of a work of art... it is an exercise in such depth, the study is an opportunity to see what others have not yet seen, to reflect the uniqueness of our own lives, to engage the best of our interpretive powers. (Stake, 1995, p.136)

Critiques of case studies are often grounded in challenges to their ability to lead to generalisations and other applications, whether through 'preciousness' and assumptions that case study data can be applied to additional settings or through the feeling that case studies lack rigour and are about telling stories rather than valid, generalizable research (Curtis et al., 2014). Hamilton and Corbett-Whittier (2013) argue that creating a focus in the field of education on generalizable qualitative research is neither feasible nor relevant, but they also outline positions in which resonance (James and Pollard, 2011) or fuzzy generalisation (Bassey, 1999) may offer alternative approaches. My own research does not aim to make generalizable claims, but builds on Lincoln and Guba's (1985) work into naturalistic enquiry. Activity theorists take the position that investigators should not aim to make generalizable claims, but to report findings which are rooted in a particular setting (Yamagata-Lynch, 2010, pp.64-5). For my own research I will follow this approach. Other criticisms of case study research are that they 'rarely include[...] information on the theoretical approach to the methodology or on the methods used to gather the data' (Corcoran et al., 2004, p.7). Corcoran et al. go on to outline quality metrics whereby case studies should include: a clear purpose; an explicit position of the role of the researcher; a critical analysis of the case; and the inclusion of all the participants (ibid, 2004, p.12). For McLeod (2010, p. 54) these challenges to case studies also constitute an ethical dimension. I have aimed to include these aspects in this chapter.

4.5 Gathering and Organising the Data

In her exploration of research methods for use in activity theory, Yamagata-Lynch (2010) outlines five elements of qualitative research: investigator role, participant selection, data collection, data analysis, and trustworthiness (2010, p.64). I have used

these five elements to organise this section: whilst data analysis and trustworthiness are considered later in this chapter, the remaining methods are discussed below.

Investigator Role

In discussions around the role of investigator in qualitative research, I take the position (Lincoln and Guba, 1985; Fetterman, 2010; Glesne, 2005) that as a human investigator I am also an instrument of research, having and analysing my own experiences during the research. This position suggests that researchers tend to be outsiders, arriving with an etic perspective able to contextualise and understand observed phenomena within their wider world view, but developing an insider perspective of their observations through prolonged engagement (Fetterman, 2010). Yamagata-Lynch (2010) usefully reviews the continuum of the observer-participant role, building on Glesne's (2005) work. In this framework, and because of my role as the programme co-ordinator of the Instant Network Schools programme, I would place myself as 'observer as participant'. Here, whilst I remain an outsider – visiting the camp, speaking regularly to participants but not being part of the daily lived reality – my role is more that of a traveller where, 'The potentialities of meanings in the original stories are differentiated and unfolded through the traveller's interpretations' (Kvale, 1996, p.4).

Participant selection

Within my interpretivist paradigm and without the intention of creating generalizable results, I do not recognise a need to conduct scientific sampling across the participants. However, it is necessary to ensure that the small number of respondents are selected in such a way as to be able to answer the research questions (Miles and Huberman, 1994). I aimed to include a large enough number to include view points from across different backgrounds and school settings within the INS programme in Dadaab camp, and to cover the different roles within the programme. I also wanted to include schools which had a range of different experiences with the programme, and to include those which had in particular been late to receive the expected tools and resources. Because of the challenges of security and transport within the camp, I selected six schools comprising six primary and three secondary from the overall INS portfolio of nine, and had these approved by UNHCR and the Vodafone Foundation.

I made the request to work with the school administration to select the Head Teacher, Coach and a convenience sample of one or two additional teachers to be interviewed. The selection was 'strategic and purposive because [it was] focusing on a cases' unique contexts' (Miles, Huberman and Saldaña, 2014, p.32). Using both the literature review and the pilot study, I pinpointed the centrality of the INS Coach and the school leadership, either the Head Teacher or Deputy Head, to the perceptions of the whole programme. Much of the literature (McMahon, 1999; Day and Sachs, 2004) acknowledges the importance of the support, engagement and understanding of school leadership in teacher uptake of new practices, as does the context of the school in terms of overall school health. This also gave a better sample across the school than was available in the pilot research, with the additional aim of triangulating the views of people in different positions with relation to power, socio-economic status (in particular incentive: national teachers), and the amount of training they have received on the technology. The final participant selection was as follows, using pseudonyms for the schools to protect their anonymity:

#	School Name	Type	Participants			# Participants
			Head Teacher	INS Coach	# Subject Teachers	
1	School A	Primary	1	-	2	3
2	School B	Primary	1	1	1	3
3	School C	Primary	1	1	1	3
4	School D	Primary	1	1	2	4
5	School E	Secondary	1	1	2	4
6	School F	Secondary	1	1	2	4

Table 2: Interview participant numbers, by school

Data collection

The main research methods for this case study were the collection of semi-structured interviews from teachers in Dadaab (n=21) from a range of schools involved in the INS programme (n=6). The selection and implementation of this as a tool is explored below. The need to understand the context of teacher perception meant that I needed to be able to analyse data from document analysis alongside interview data into thick descriptions (Yamagata-Lynch, 2010) which can fully show a rich picture which brings

together experience within a context (Geertz, 1973). I did this through document analysis with a focus on secondary data around the schools themselves and the context of education in Dadaab: a list of internal documents analysed is attached as Annex 2.

The structure of the data collection is outlined below:

Research Question	Data Collection method	Participants / Informants
What do teachers perceive to be the benefits of their involvement in the programme on their teaching and learning?	Semi-structured interviews	Teachers (n=21) across schools (n=6)
	Document analysis	Documents from school, UNHCR, partners, media etc.
What is the impact on teacher motivation?	Semi-structured interviews	Teachers (n=21) across schools (n=6)
What do teachers perceive to be the impact on student motivation?	Semi-structured interviews	Teachers (n=21) across schools (n=6)
What do teachers perceive to be the constraints or barriers to their optimal use of the programme to support teaching and learning?	Semi-structured interviews	Teachers (n=21) across schools (n=6)
	Document analysis	Documents from school, UNHCR, partners, media etc.
What are the development needs for optimal impact of the programme: (i) At the level of the individual teacher (ii) For professional development activities and opportunities, and (iii) For modifications to the programme design?	Semi-structured interviews	Teachers (n=21) across schools (n=6)

Table 3: Research questions and data collection

Data collection: Semi-structured interviews

With a focus on generating rich descriptions of practice and interaction, I take Kvale’s position that ‘the purpose of qualitative research interview[ing]...is to understand the themes of the lived daily world from the subjects’ own perspectives’ (1996, p.27). This is echoed in Tuckman (1972, cited in Cohen et al., 2000), who describes research interviews as a way to gain access to ‘...what is ‘inside a person’s head’ (2000, p.268): to understand the participants’ lived realities.

I adopted semi-structured interviewing for a number of reasons. Hitchcock and Hughes (2002) note that the flexibility of semi-structured interviews ‘allows depth to be achieved by providing the opportunity on the part of the interviewer to probe and expand the respondent’s responses’ (2002, p.157). They outline the approach as the

interviewer preparing key questions, but listening carefully and taking an enabling style in which allows the interviewer to expand on meaning and probe for further information. I aimed to use the interviews to answer basic questions, but to facilitate respondents in telling their own stories, and creating a space to follow new ideas. I also wanted to raise a number of issues whilst 'mak[ing] it easy for interviewees to respond' (Clough and Nutbrown, 2007, p.134). This desire to 'raise issues' meant that unstructured interviews were also not suitable. Because of my position as project manager as well as a researcher, I was also concerned that unstructured interviews would have yielded only discursive information on project management issues, rather than focused detail on the teachers' own engagement with, and perceptions of, the programme.

In addition, I believe that semi-structured interviews are the strongest instrument for understanding perception, which is central to my overarching research question. In his work on blended perspectival views, Merleau-Ponty (1947) posits that perceptions are a human experience which is unique to a moment in time, a snapshot or reaction to something which is created by a blend of individuals' world views, knowledge and experience. This understanding resonates with my interpretivist paradigm in which perceptions, or interpretations, are grounded in time. Researchers (Hammerness et al. 2005; Berliner, 1987; Livingston and Borko, 1989) suggest a focus on what teachers notice and observe, and find that the experience and capabilities of teachers have a significant impact on the way in which they observe phenomena and how this impacts on their perception of it (Vagle, 2009).

In order to conduct semi-structured interviews, I developed a series of questions to be used as a guide and prompt. These were developed in line with the research questions, and framed by activity theory. From the activity theory perspective, interviews are an important tool in finding information about the subject (in this case, teachers); their perspectives on the tools or mediating artefacts; and the relationships and tensions between each of the nodes. Interviews are also a way of collecting rich information about the setting, and with the emphasis on the 'complex, situated and distributed nature of ongoing educational activities' (Junor Clarke and Fournillier, 2012, p.649). The aim was to focus interview questions on gaining an understanding of the particular setting of the case study: Dadaab as a refugee camp; the individual schools;

the Instant Network Schools programme and the ecosystem around it; and the lived realities of each of the individual teachers I interviewed.

In preparing the research questions, I used Mwanza’s eight-step model (Mwanza, 2002, 2011) which is rooted in using activity theory. Whilst Mwanza has developed the Activity Oriented Design Method (Mwanza, 2002; Mwanza-Simwami, 2009) which is a broader approach, I used only the model to guide my question preparation:

Identify:		Questions to ask:
Step 1	Activity of interest	What sort of activity am I interested in?
Step 2	Object	Why is the activity taking place?
Step 3	Subjects	Who is involved in carrying out this activity?
Step 4	Tools	By what means are the subjects performing this activity?
Step 5	Rules and regulations	Are there any cultural norms, rules or regulations governing the performance of this activity?
Step 6	Division of labour	Who is responsible for what, when carrying out this activity and how are the roles organised?
Step 7	Community	What is the environment in which activity is carried out?
Step 8	Outcome	What is the desired Outcome from carrying out this activity?
Table 4: Mwanza’s eight-step model		

I conducted interviews according to the timeline below:

Implementation of Semi-Structured Interviews	
Participants	Timelines
Teachers (n=10) across schools (n=3)	September 2015
Teachers (n=7) across schools (n=2)	January 2016
Teachers (n=4) across schools (n=1)	March 2016
Table 5: Interview collection summary by date	

Data collection: Analysing documents

Document analysis is the other key research tool. During the fieldwork period, documents and artefacts (a list of digital artefacts and content available in the INS Classroom is attached as Annex 3) were collected with the aim of better understanding the context, particularly around rules, community and division of labour, within which network of activity exists. Merriam (2009) cites the importance of researchers understanding and selecting documents which are authentic, accurate and relevant to

the study. The period of time spent in the field before undertaking primary research means that I had ample guidance from a range of stakeholders as to where to find and how to understand secondary data. During the full 18-month period in which I undertook field work, I also collected secondary data, including formal management information reports on school attendance and enrolment; national examination results for 2014 and 2015; and programme management reports both verbally and in writing from implementing partners and other stakeholders involved with the INS project. Much of the literature was shared with me in my position as the Programme Manager for INS, but I had clear communication with the UN and schools as to my dual use of all data within this research. Documents were grey literature relating to either UNHCR and the overall approach to education in the camp, or specific programme documents from the INS. These included reports from the implementing partners; media stories from UNHCR and Vodafone Foundation; and reports from trainings and workshops held during previous phases of the programme. Artefacts focused on the digital content provided as part of the INS project, such as e-books, and online repositories of videos. I also wrote a trip report from every visit, and kept a reflective journal, in line with the recommendation to keep regular notes and journals on the research process when engaging in reflexive practice and activity theory (Postholm, 2015). A list of these is included as Annex 2.

4.6 Conducting the Research

The data collection took place in four field visits to Dadaab: September and November 2015, and January and March 2016. This meant one visit every two months over a period of seven months, which split across two school years. This data collection came after a one-year engagement period preparing the groundwork for the research and undertaking the pilot study, between September 2014 and September 2015.

Conducting the research: Interviews

Whilst my pilot research design had included online interviews and the collection of data through surveys, the revised design centred on conducting face-to-face interviews with all respondents. Whilst in the case of Dadaab, face-to-face research is extremely time-consuming and carries with it risks around safety, the richness of the data makes it

worthwhile. Gillham (2000) notes that this type of interview is crucial when working with small data sets, focused on gaining insight and understanding, and where ‘everyone is key’ (Gillham, 2000, p.11).

The semi-structured interviews were all conducted face to face during field visits to Dadaab. The location of the interviews differed: for Secondaries School F and School E, and Primaries School B and School C, I was able to travel to the schools and to conduct the interviews within a closed room in the school setting. For the others, because of the geographical distance from the UNHCR compound and associated additional security risks under consideration at the time, I was only permitted to spend very short periods in the school or not to travel at all. With these, I conducted the interviews in a closed room in the UNHCR field office which is a familiar setting to the teaching staff. Each interview was conducted one to one, with no other people in the room. I allowed 45 minutes for each interview, and the majority lasted 40-45 minutes, though some, especially with Head Teachers for whom there were many calls on their time, lasted only around 30 minutes. During my day in one secondary school, the police escort received additional security information and cut short the time I was able to spend there. The table below summarises basic information about the respondents who took part:

#	School	Position	M/F	Type	Nationality	Date
1	School A	Head Teacher	M	Primary	Somali	Sept 15
2	School A	Teacher – English and Social Science	M	Primary	Somali	Sept 15
3	School A	Teacher: English Grades 6-8	M	Primary	Somali	Sept 15
4	School F	Coach and ICT teacher	M	Secondary	Kenyan	Sept 15
5	School F	Teacher: English	F	Secondary	Kenyan	Sept 15
6	School F	Teacher: physics and chemistry	M	Secondary	Kenyan	Sept 15
7	School F	Principal	F	Secondary	Kenyan	Sept 15
8	School C	Coach and Teacher Class 1-3	F	Primary	Kenyan	Sept 15
9	School C	Teacher: science	M	Primary	Somali	Sept 15

10	School C	Head Teacher	M	Primary	Somali	Sept 15
11	School D	Head Teacher	M	Primary	Somali	Jan 16
12	School D	Coach	M	Primary	Somali	Jan 16
13	School D	Class teacher 1-3	M	Primary	Somali	Jan 16
14	School D	Class teacher 1-3	M	Primary	Somali	Jan 16
15	School B	Head Teacher	M	Primary	Somali	Jan 16
16	School B	Coach	M	Primary	Somali	Jan 16
17	School B	Department Head – Maths	M	Primary	Somali	Jan 16
18	School E	Head Teacher	M	Secondary	Somali	Mar 16
19	School E	Teacher: maths and science	M	Secondary	Somali	Mar 16
20	School E	Coach	M	Secondary	Somali	Mar 16
21	School E	Teacher: languages	M	Secondary	Kenyan	Mar 16

Table 6: Interview participant information

I recorded the interviews with the permission of the respondents, and explained that I would transcribe and use the information but that the interview recordings of their voices would not be used in other ways and that their contribution would be anonymised. I also noted down the respondents' names, positions and schools in case these were unclear in the recording, though this information will not be used in report findings, and also noted any key things they said which required attention or probing during the interview. I began each interview with an overview of the research and the notion of informed consent, including anonymity and their right to withdraw from the study. The research was conducted in accordance with the letter of University of Leicester guidelines and with the spirit of informed consent: competence and the capacity to engage; voluntarily taking part, without coercion; being fully informed about the research process and intent, and being able to leave the study; and comprehension, properly understanding the information given (Cohen et al., 2011; Walford, 2005; BERA,

2011). Every teacher interviewed signed the informed consent forms (blank form attached as Annex 1). A full exploration of ethics is included in Section 4.9, pp.107-111.

At each school, all the interviews were conducted on one day. At the end of each day of data collection, I wrote up brief notes of the school situation and context in the school, such as changes in staff or numbers, or anything else which could have an impact such as one school which had recently had a cholera outbreak. I also wrote brief notes on the interviews, including initial thoughts on the tone of the interview or emerging themes, plus things which had been surprising. These thoughts were observations and early reflections rather than structured analyses, but I found it useful to refer back to them when undertaking the coding and analysis exercises.

Transcription

Following on from the recording of the interviews, the next step was to transcribe the data so that I could review it. Some researchers suggest that there should be the minimum amount of time between conducting an interview and analysis, with recordings being transcribed and considered immediately after each interview (Miles, Huberman and Saldaña, 2014; Maxwell, 1996). Others (e.g., Seidman, 2013) recommend conducting all, or at least a set, of interviews and then undertaking transcription and analysis in order to 'Try and minimize imposing on the generative process of the interviews what I think I have learnt from other participants' (Seidman, 2013, p.116). Because of the field conditions, security and limited time in schools, along with the need to record multiple interviews in sets, I took Seidman's (2013) position and transcribed after each set, so in the weeks following on from the interviews: in October-November 2015, February and April 2016. The transcriptions in late 2015 took a huge amount of time, partly because I was getting used to the process and began with the intensive approach of transcribing verbatim every word. It also took some time to get used to the accents and idiom of the teachers, and the background noise that was hard to avoid in the setting of the camp.

Conducting the Research: Field conditions and context

The full challenges of insecurity in Dadaab and how these impacted my research is discussed on pp.28-9. These logistical and security challenges added tensions, time constraints and challenges to my research. To ensure trustworthiness within qualitative

research in general and activity theory in particular, prolonged engagement in the field is considered key (Lincoln and Guba 1985). As Yamagata-Lynch (2010) notes, however, what is considered 'prolonged' is contested. Instead I take Glesne's (2005) approach that the length of time spent in the field needs to be sufficient to build relationships, develop a profile and understand the context well enough to engage people in research. My own engagement in Dadaab began in September 2014, meaning I had a full year of field visits and interactions before undertaking the interviews. In this period, I undertook field visits to Dadaab in September 2014, then January, March and May 2015 during which I:

- Made connections and began relationships with key informants;
- Attended several programme meetings to understand the context and challenges in education generally in the camp;
- Undertook the pilot research of five teacher interviews and one focus group discussion;
- Carried out several observation visits and informal discussions to INS schools;
- Harvested secondary data and reports from schools, including implementing agencies such as UNHCR and UNICEF who monitor basic school data, and ensured access to additional data during the lifetime of the study.

From September 2015 – March 2016, I implemented the tools described in the research design (see Table 3, p.89).

4.7 Data Analysis

The process of data analysis aims to make sense of the data: to engage with and understand the detail, then to zoom out and examine the bigger picture. An in-depth engagement with the topic and a transparent approach are crucial to good qualitative research (Yardley, 2000, p.219). As the researcher is the primary 'instrument' of data collection and analysis (Lincoln and Guba, 1985), reflexivity is vital (Glesne, 1999; Merriam, 2009; Stake, 1995). I undertook continuous analysis during the entire research phase, noting that, unless engaging in grounded theory, this is 'the much preferred way to analyze data in a qualitative study is to do it simultaneously with data collection' (Merriam, 2009, p.171). From the position of reflexivity, this was through

writing memos and keeping a reflective journal, both of which are recommended within the literature (e.g., Glesne and Peshkin, 1992; Maxwell, 1996) which suggests that 'memoing' or noting down ideas throughout the research is the beginning of the analytical process. This section, however, aims to present a coherent account of the structured journey of analysing the research data, before presenting and discussing findings in the next chapter.

Activity theory approaches to analysis

Whilst the methods of analysing data are many and varied, there is agreement that the process of qualitative data analysis involves organizing the data to make sense of what you have learnt, and working with that data to describe phenomena and participants; find similarities and differences; tell stories; find links and patterns; and interpret the data in relation to your research questions (Glesne, 1999; Ryan and Bernard, 2003; Saldaña, 2009; Radnor, 2002). I followed this approach whilst concentrating on the categories developed using activity theory. This is a common approach in studies using AT: Russell and Schneiderheinze (2005) began their analysis by mapping the AT nodes of each teacher involved, then identified contradictions and the turning points in managing tensions which led to transformation. McNicholl and Blake (2013) followed the same steps, but included a member checking exercise between the initial coding against activity theory nodes, where respondents guided the discussion on contradictions. The focus on contradictions and tensions is central to analysing data using AT. Karasavvidis's (2009) study of undergraduate students using blended learning focuses on tensions and contradictions, within and between nodes. In discussing the analysis process, he notes, 'Following the AT methodology, student interviews were content analyzed to determine tensions which emerged throughout the blended learning experience, focusing mostly on the configuration of face to face and the online course components' (2009, p.198). In his paper exploring the use of activity theory by mathematics educational studies, Nuñez (2009) argues that it is the focus on contradictions within an activity system that makes AT so relevant to educational researchers. There were fewer examples of researchers beginning with general thematic coding: Barnes and Kennewell (2016, p.5) noted that they used thematic

analysis to look for initial patterns; then coded using activity theory themes; and finally developed sub-codes under activity theory nodes using thematic analysis.

The analysis process

Whilst Merriam (2009) takes the position that all qualitative analysis is inductive and comparative, Bergman (2010, p.391) suggests 'iterative coding' as one of three options for conducting a thematic analysis which blends inductive and deductive coding. This aims to both hear participant voices whilst interrogating the data based on research questions and literature. Inductive coding, where 'the patterns, themes, and categories of analysis come from the data; they emerge out of the data rather than being imposed on them prior to data collection and analysis' (Patton, 1980, p. 306) is in line with my own interpretivist approach. I also appreciated – and found myself – that patterns do not emerge by themselves, but require a process to tease them out and contextualise them in order to generate meaning. I was influenced by the approach of reflexive iteration (Srivastava and Hopwood, 2009) which suggests three questions which guide phases of analysis:

Question 1: What are the data telling me? What is coming out of my understanding of the field, observations, and an engagement with ontological and epistemological assumptions? Are different data sets telling me different things?

Question 2: What is it I want to know? What are my research questions and the objective of the study – what is my theoretical framework?

Question 3: What is the dialectical relationship between these two questions? Which aspects of these relationships help me answer my research questions?

(Adapted from Srivastava and Hopwood, 2009, p.78)

Whilst this is a simple approach, I found these questions freed up space within the perceived tension between the voices of the participants and the need to stay focused on answering the research questions.

As a first approach, I printed all the interview transcripts together as a bound book, and read them through twice. Personally, I found the physical feeling of engaging with a 'book of stories' made me feel closer to the respondents' own narrative, and allowed me to engage at a range of different levels. The first time I did not make any marks or

notes; the second time, undertook first cycle descriptive coding (Saldaña, 2013) using the language from the responses. I coded freely, using the respondents' own words and marking these in the margin, as well as highlighting longer portions of text which stood out in relation to my research questions. My only aim was to understand the 'possible dimensions' of the research (Silverman, 2015, p.337).

The second phase of data analysis looked at description. In case study research this is often done using categorical aggregation, or the development of categories and patterns (Creswell, 1998). During the aggregation process, categories are constantly compared against one another, with new codes being generated whilst others are amalgamated or split into sub-categories. I also began to deliberately look for data which described topics such as the phenomena itself, context, strategies and conditions which shape the participants' engagement with the phenomena (Gibbs, 2010). In this phase, I moved from paper copies into NVivo software, partly to save time and ensure better data security, but also to make use of the powerful tools for running queries and reports. Silverman (2015) notes the importance of iterative analyses and coding which changes as your understanding grows, and of undertaking the initial rounds of coding in as much detail as possible. I continued the detailed engagement with each word and line of the data using Nvivo, a process which contributes to validity through focusing on what is there rather than on a priori assumptions. From this, I built an outline table noting key themes which were present in the majority of the interviews:

Theme (named after Coding)	In Vivo Codes (quotes)			
Pedagogy of INS	Learning becomes real	We engage with students more	Makes learning more cognitive and meaningful	We learnt ways to improve our performance
'Seeing' creates better understanding	Children have never seen physical features	They 'see' practically	They have not gone to the outside world. Now they see	They need to see - to be in touch - to understand
Enrolment and attendance improves	Class control is very easy	When their curiosity comes they are attentive	Learners migrated to this school	
Limits to education /	Education stops here	Few students have tertiary	When I am properly	Not many students are

ambition in the camp		opportunities – few are motivated	educated I will go back to my country	ascending education
Teacher self-perception	Teachers are eager to learn this	It makes their work easier	We feel better than other schools	Teachers are eager to research for themselves
Managing mixed ability	You can know the problem	Mix according to ability	Put faster learners together and push them with new work	Teachers are enabled to go round and check each one
Coaches are overstretched	Workload doesn't assist him to assist others	I am two-ways busy [coach and teacher]	I am not paid to do this	It brings [Coaches] a lot of extra work
Sharing supports refugees' psychosocial growth	This is for all people, you must share – it's like guidance and counselling	It links the gap between refugee children and the world outside		
Concerns of knowledge and power	If you don't know, it may fail you	Teachers must be comfortable to take their students with them	Not all teachers are ICT literate: train them first	Even students are sometimes afraid to touch or do the wrong thing
Table 7: themes and in vivo codes from the second phase of coding				

I undertook attribute coding in Nvivo as a first step to note the significant and comparable attributes within classifications. Saldaña (2009) considers attribute coding as a management technique, logging 'essential information about the data and demographic of the participants for future management and reference' (Saldaña, 2009, p.55). I applied this type of coding to all the transcripts in order to clarify them within the case study and enable me to explore the perceptions and different reflections from individuals and schools with different characteristics:

Organisation (for schools)	People (individual teachers)
Name	Name
No. Students	Gender
Primary / Secondary	Incentive / National staff
Implementing Partner	Country of birth
	No. Years Teaching

	Teaching Qualification Level
Table 8: Attribute coding	

The third phase, of winnowing and narrowing (Ryan and Bernard, 2003, p.85) was the process of mapping the themes against the research questions and nodes based on the activity theory model. This was also important in creating a valid case study, with a bounded focus on time and activity (Yin, 2003; Stake, 1995). This ‘focused coding’ (Bryant and Charmaz, 2007) follows the initial overview phase and includes a comparison of the codes against the wider body of research. Looking for repeat language found across in vivo codes are a good place to start to look for patterns (Miles, Huberman and Saldaña, 2014), and this is where I began. This took some time and reflection, with the challenge of ensuring that the participant voice was heard without dismissing areas which are important to them, against the need to present a coherent analysis of the data in order to answer the research questions. Where there were themes which were consistent but not relevant to this study, they have been reflected on in the analysis and outlined in the future research section. The code structure was organised thus:

Table 9: Code Structures and Names in Nvivo
Nodes\\Community
Nodes\\Community\\Donor Relationship
Nodes\\Community\\Girls in school
Nodes\\Community\\Global Digital World
Nodes\\Community\\Other schools in Dadaab
Nodes\\Community\\Parents Groups
Nodes\\Community\\Students as Refugees
Nodes\\Division of Labour
Nodes\\Division of Labour\\Coach Structure
Nodes\\Division of Labour\\Coaches - Incentivisation
Nodes\\Division of Labour\\Coaches – Role
Nodes\\Division of Labour\\Coaches - Training
Nodes\\Division of Labour\\Need for ICT Staff
Nodes\\Great Quotes
Nodes\\Mediating artefacts - INS hardware
Nodes\\Mediating artefacts - INS hardware\\Challenges - Amount of hardware
Nodes\\Mediating artefacts - INS hardware\\Challenges - Network
Nodes\\Mediating artefacts - INS hardware\\Challenges - Network\\Teachers Paying for Data

Nodes\\Mediating artefacts - INS hardware\\Challenges - power & electricity
Nodes\\Mediating artefacts - INS hardware\\Challenges - Type of hardware
Nodes\\Mediating artefacts - INS hardware\\Fear Of Tools
Nodes\\Mediating artefacts - INS hardware\\Perception of Seeing
Nodes\\Mediating artefacts - INS hardware\\Teacher use of INS
Nodes\\Mediating Artefacts or Tools
Nodes\\Mediating Artefacts or Tools\\Content
Nodes\\Mediating Artefacts or Tools\\Library
Nodes\\Mediating Artefacts or Tools\\Library\\Lack of School Books
Nodes\\Mediating Artefacts or Tools\\School furniture and infrastructure
Nodes\\Mediating Artefacts or Tools\\Tools for School Management
Nodes\\Object – Students
Nodes\\Object - Students\\Attendance
Nodes\\Object - Students\\Enrolment
Nodes\\Object - Students\\Hands On & Seeing
Nodes\\Object - Students\\Improved understanding
Nodes\\Object - Students\\Learning outcomes
Nodes\\Object - Students\\Student interaction
Nodes\\Object - Students\\Student Numbers
Nodes\\Object - Students\\Student perception of benefit
Nodes\\Object - Students\\Working with mixed ability levels
Nodes\\Quotes for School Descriptions
Nodes\\Rules
Nodes\\Rules\\Curriculum
Nodes\\Rules\\INS Policy
Nodes\\Rules\\Timetables
Nodes\\Subject – Teachers
Nodes\\Subject - Teachers\\Continuous Professional Development
Nodes\\Subject - Teachers\\Perception of INS
Nodes\\Subject - Teachers\\Physical impact on teachers
Nodes\\Subject - Teachers\\Teacher class preparation
Nodes\\Subject - Teachers\\Teacher motivation
Nodes\\Subject - Teachers\\Teacher requests

With this narrowed data, I then asked different questions of the data with the aim of exploring the bigger picture. This included looking for patterns and exploring whether perception of teaching and learning differed between people with different attributes such as refugee status and nationality, or level of training. I looked for missing data and themes which I had anticipated from the pilot study or literature which were not

present; and for places where unfamiliar 'indigenous typologies' were hiding deeper meanings. This linked into Charmaz's (2003, pp. 94-95) concept of interrogating the assumptions behind positions and statements, something which, as an outsider researcher from a very different cultural background, was essential in making sound judgements. This also supported the generation of 'implicit data' (Radnor, 2002, p.72) where I as the researcher was constructing the meaning from the data. Finally, I looked in particular for relationships between codes which linked with, or contradicted, literature, and places where the connections between themes gave an insight into teachers' beliefs and conceptions.

Continuing with the focus of AT on contradictions (Murphy and Rodriguez-Manzanares, 2008), I also looked for patterns which suggested tensions or contradictions either within or between nodes. I grouped the sub-themes under the activity theory nodes, building on the model I had envisaged based on the experience of undertaking the data collection. I also removed those sub-themes from the model that I had not found in the data. Ryan and Bernard (2003) see this as the final phase of analysis, where findings are mapped to theoretical frameworks and analysed therein. For my research, this use of the activity theory framework gave fresh insights to the data, and is also a contribution to the research community in actively using the theoretical model.

Recognising the importance of ensuring clarity and confidence in allocating data into themes and enhancing the trustworthiness of the research (Radnor, 2002; Boyatzis, 1998), I created a matrix based on Murphy et al (2013). This shows the activity theory nodes, a description of the node based on AT literature, and guiding questions which could be asked of the data to ensure that it was correctly coded. For example, to code against the node 'community', I looked at definitions of the term such as 'Multiple individuals and/or sub-groups who share the same general object and who construct themselves as distinct from other communities' (CRADL, 2009), and generated questions from this which would guide my coding. For 'community', these included, 'What are the relationships between the communities involved? What impact does this have?' The full table is shown below:

Coding Protocol	Definition	Guiding Questions
Subject	'The 'who' of the activity system' (Wuori, 2009:37) 'individual or sub-group whose agency is chosen as the point of view in the analysis (Engeström, 1990:79)	What backgrounds and characteristics of the teachers (e.g. refugee status, professional status, qualifications) are relevant to understanding the activity under study?
Tools	'The 'how' of the activity system' (Wuori, 2009:37) That which 'mediates between the individual (the subject of activity) and the individuals' purpose (the object of the activity)' (Bellamy, 1996:124)	What tools, external or internal, support activity? What is the role of the INS Programme tools in supporting activity? How are they viewed?
Community	'Multiple individuals and/or sub-groups who share the same general object and who construct themselves as distinct from other communities' (Center for Research on Activity, Development and Learning, 2009: Activity System Section, para. 4)	What are the communities involved in the activity? What are the relationships between the communities involved? What impact does this have?
Division of Labour	'The role each individual in the community plays in the activity, the power each wields, and the tasks which each is held responsible for' (Bellamy, 1996:125)	What are the roles and responsibilities of those involved in the activity? How are individuals supported?
Norms or Rules	'Explicit and implicit regulations, norms and conventions' (Engeström, 1990:79) 'The system's socially constructed / understood conventions' (Terantino, 2009:38)	What are the explicit or implicit conventions governing the activity? How are these perceived, - what are the perceived rules?
Object	'Precedes and motivates activity' (Nardi, 1996:80) 'Personal or collective motives' (Wuori, 2009:37)	Why are teachers engaging in the activity? Perception of students and learning outcomes?
Outcomes	'The activity system produces outcomes' (Russell and Yanez, 2003:339)	How are teachers different after the activity? What are the effects?

Table 10: Definitions and questions guiding the coding process based on Activity Theory. After Murphy et al, 2013, p.175-176 (Column 2, 'definitions' is quoted directly)

4.8 Trustworthiness and reliability

For research to be meaningful and ethical, it must be viewed as a trustworthy process, from the development of research questions through to coding and analysis (Yamagata-Lynch, 2010; Gedara and Williams, 2016). Within an interpretivist paradigm, I am not trying to prove that something is true, but to apply criteria of dependability, credibility and confirmability to my findings (Lincoln, 2009). Firestone (1987) argues that the researcher should be concerned with how a reader is persuaded of the validity of the findings, noting that qualitative research must, '...provide the reader with a depiction in enough detail to show that the author's conclusion 'makes sense'' (Firestone, 1987, p.19). I continued to follow my conceptual framework (see pp.76-79) in coding the data, agreeing that '...at an axiological level, the interpretivist paradigm is more concerned with relevance than with rigour' (Ponelis, 2015, p.538). This 'relevance', however, must stay true to the data and it is one of my roles as the researcher to demonstrate how the findings have come from this rather than from my own self (Guba, 1981; Shenton, 2004).

A key element of trustworthiness is in documenting and mapping decisions, reflections and thoughts throughout the life of the study: 'investigators need to document a clear trail of decisions they made regarding the study and methodological procedures' (Yamagata-Lynch, 2010, p.77). In my research, this has been done through keeping reflective journals during work with data and whilst reviewing literature; note taking and field observations, especially during and after interviews; and the logging of memos during coding and analysis. The conducting of pilot research and the modification of the main study through the lessons learnt therein also contributes to the fidelity of this study (Thomas, 2003).

Triangulation has been used, but has been somewhat limited by the research context. In considering the limits of the pilot research, challenges were noted on the use of additional methods (focus group discussions and surveys) and the inclusion of additional participants to create a larger respondent selection. Whilst the use of diverse data collection is seen to enhance trustworthiness (Hamilton and Corbett-Whittier, 2013; Patton, 2002), and I have utilised both interviews and document analysis, I recognise this as one of the limits of this study. This lack of breadth is somewhat

mitigated through my 'prolonged engagement' (Lincoln and Guba 1985; Glesne 2005) with people working with the INS programme in Dadaab, and the depth of my rich exploration of their lives. Trustworthiness will also be considered in the limitations section on pp.111-113.

4.9 Ethical implications

The nature of refugee status and the security challenges of the camp setting mean that the respondents should be considered as an extremely vulnerable group, and that ethical considerations must be taken seriously throughout the research. Whilst researchers should always strive to keep the welfare of participants at the forefront of their considerations (Stutchbury and Fox 2009, p.502), working with vulnerable groups makes this duty of care essential. For refugees in Dadaab, they are in a precarious social position: during my research period the political machinations around the planned closure of the camp and the vulnerability felt by the refugees was clear in conversations and in the Kenyan media. In addition to the unstable position they are in now, refugees 'also bear the weight of the conflicts, abuse, torture and trauma which led to their forced migration in the first place' (Darling, 2014, p.201). They may also suffer from 'consultation fatigue' where, in addition to teaching and family duties and the strains of life as a refugee, they regularly receive visitors from donors, government bodies and other agencies who are seeking to assess and evaluate their work. Indeed, two respondents talked about the regularity of 'visitors' to the school and the questions they are asked. There is a small but growing body of work on the ethics of researching with refugee communities, and the need to clearly position research within the 'do no harm' approach of humanitarian work (Mackenzie et al., 2007; Jacobsen and Landau, 2003). I take Wood's (2006) position that the key ethical consideration in working with these populations must be 'to ensure that those who participated in the project did not run any greater risk as a result and that potential research subjects made their own informed decision to participate' (Wood, 2006, p.379). These combined pressures and vulnerabilities mean that taking an ethical approach to working with refugee communities means going beyond the formal adherence and mechanisms of academia and engaging in 'ethics in practice' (Guillemin and Gillam, 2004; Darling, 2014). These reflections led me to consider anonymising the refugee camp, but I decided against it.

The conditions of Dadaab are such that it would be immediately identifiable, unless I removed so many details (host country, provenance of the majority of refugees) for the research to become meaningless.

A central challenge to refugees is that lack of control they are able to exert over their own lives. Whilst they are given food and shelter, they are often stripped of the ability to make choices. This increased the importance of recognising the agency of key informants who take part, and both taking time to build relationships, work on informed consent, and create space for respondents to ask me questions throughout the research. This adds an ethical dimension in relation to my conceptual framework where I am interested in the lived reality, where for refugees the 'every day' is where power dynamics, governance, sense-making and choice all happen at once:

The everyday becomes crucial as a site of contradictions where acts of solidarity, power, alienation and possible resistance are experienced and enacted, as well as a resource for competing reactions and coexistence of both strategies and discourses of belonging and nonbelonging.

(Karner 2007, p. 125)

Providing a real choice to take part was crucial in upholding, in particular, the refugee participants right to be 'conscious actors, not passive subjects in the various situations in which they find themselves' (Ralston 2006, p. 184). One of the limits of the pilot study had been that organisations were keen to push the national teachers to take part, aiming to give the 'best' possible picture of the teaching staff and the programme. During the modifications to the research, I was able to ask to work with more incentive teachers, and found that those who chose to take part were keen to be able to talk openly to me and gratified that their opinions were taken seriously. However, participants' responses were anonymised and instead represented with a label so that they can be clearly disaggregated so that it is clear who the responses come from in terms of gender, years of teaching experience and other relevant factors whilst protecting the identity of the respondents.

Because of the complex hierarchies in the education system in Dadaab, I had to undertake a multi-stage process to establish trust and build an ethical foundation with participants and beyond. I have already discussed my full year of regular visits and

interactions with teachers and other stakeholders before undertaking the main research study (p.96), which aimed to build relationships, become a familiar presence, and understand the context enough to engage people in research (Glesne, 2005). During this period, I undertook two workshops to brief co-ordinating stakeholders on the research, including UNHCR and key staff from Implementing Partners who are responsible for managing schools and teachers. These also set the parameters in which partners agreed to share internal documentation with me. Following the first workshop, I received official permission from UNHCR Headquarters to undertake the main study.

My research was conducted in accordance with the letter of University of Leicester guidelines and with the spirit of informed consent: competence and the capacity to engage; voluntarily taking part, without coercion; being fully informed about the research process and intent, and being able to leave the study; and comprehension, properly understanding the information given (Cohen et al., 2011; Walford, 2005; BERA, 2011). However, the engagement needed with participants to ensure that an ethical foundation was created needed to be expanded beyond signature of an official consent form. Building on the workshops with UNHCR and Implementing Partners, I also undertook a workshop with all the 30 Coaches from the project in advance of the pilot study in March 2015. This included a longer description of the research and the meaning of informed consent, as well as a discussion of the kinds of documents research might be used in and whether they would be identifiable. Whilst this session was well received, I acknowledged both that the boundaries of the research changed with the revisions for the main study meaning that more teachers from each school would be included, and that the dynamic movement of teachers meant that many people who would be interviewed in future months would not have been in this workshop.

Building on this, I integrated additional consent discussions into the data collection phases. Before work in each school, I outlined again the contents on the planned research, meaning of informed consent, and approach to anonymity verbally to the Head Teacher of each school in order to receive consent from them. There was often a particular interest in how I would personally benefit from undertaking the research, and a discussion of my doctoral work and the value of education for individuals. As a

personal reflection, I found these discussions interesting as the idea of how education can benefit both the individual who is involved and the wider community related to my research questions, and also reflected the generosity of spirit of the teachers. Before each individual interview, I verbally ran through consent discussions with every participant, and answered any additional questions they had. Once we had discussed the research and the consent they were being asked to give, participants were asked to sign a consent form (see Annex 1), and I made it clear that they could change their minds during the interview or at a later date. I also gave them contact points in UNHCR and in the implementing partner organisation to whom they could raise concerns if they did not feel comfortable contacting me directly. To date, nobody has been in touch with myself or the organisational representatives to request to be removed from the study. Whilst this approach to building a foundation of participant engagement and consent was long and sometimes felt repetitive, providing a real choice to take part and engaging with the individual participants and those stakeholders engaged in supporting them, meant that there was a clarity for people taking part in how their involvement was valued, and, I believe, addressed the ethical considerations of working with vulnerable refugee populations outlined above.

As the programme co-ordinator for the INS programme, there were also challenges in navigating both my position of power as a 'donor', and my own 'emotional involvement' and interest in the participants and the research (Hadfield-Hill and Horton, 2014, p.136). The ethical issues surrounding my position as both researcher and a stakeholder with a position of power within the context of the INS programme are many; from the selection of the subject to my personal socio-demographics. I was also in the strange position of being an insider where I am working within the boundaries of professional relationships and power structures, and an outsider where I was an occasional, if regular, visitor to Dadaab with no day-to-day relationship with the teachers who took part in the study. There is an ethical dimension to the relationship between myself as a researcher and the participants, and a contradiction between the need to build trust, and clarity that I am an outsider and that the research does not impact on my relationship with them as a programme manager.

This dynamic was of particular consideration when designing the research. Ethical issues are unavoidably entwined with methodological decisions in interpretive education research (Cohen, Mannion, and Morrison, 2007), and with the challenges of power relationships. These were between myself and the participants, and between the participants (and each other) and the supporting bodies to the research such as UNHCR or the school management. I had to pay particular attention to these power dynamics in the design of research instruments. In their discussion on power play during one-to-one interviews Aléx and Hammarström (2008) posit that all interview situations are fraught with the conscious and unconscious power narratives that both the interviewer and the interviewee bring with them to the process. These 'attempts to position ourselves within social and cultural circumstances' (Ibid, 2008, p.169) shape our internal narratives and therefore our interactions, impacting on the information which is shared. Aléx and Hammarström (2008) also suggest that the process of reflexivity encourages the interviewer to analyse their own positions and how these impact on how they present themselves, and to become 'more conscious of being a co-creator of the narratives and situates the researcher more firmly in the research process' (Ibid, p.170). When interviewing participants, I was conscious of their vulnerability, and in particular past trauma and the possibility of raising an emotional response. For this reason, I used semi-structured interviews with open questioning, and facilitated the respondents in guiding the interview. In particular, I found that many people were reluctant to talk about their past and how they came to be in the camp, so other than establishing if they were incentive or national teachers I did not push on their personal histories. Lunsford Mears (2009) notes the importance of reflexivity in practice: encouraging researchers using this method to consider the similarities and differences between themselves and the subjects being researched, and using these as a way of assessing the relationship between contexts. Whilst I put in place a number of elements to navigate these power structures (e.g. undertaking semi-structured interviews with individuals in neutral spaces), I also considered these relationships and dynamics as being closely related to the phenomena being studied.

Finally, I tried to maintain an awareness of the cautions within the social justice approach that relate to my own context as a European individual undertaking research in crises in Africa. There are particular critiques within a social justice approach.

Commentators such as Robinson-Pant, (2000) argue that cross-cultural research, whether within or without national borders, comes with a set of additional ethical questions and requires additional focus on the individual researcher and their own reflection. These are further explored in my personal reflection in at the end of this thesis on p.171-2. There are also issues of the ownership of data, and the power relations where data collected is also related – or seen to be related – to programme design and fundraising (Newby, 2010). With particular awareness of my role as working for a donor, I was careful to ensure that the respondents, and their managers, were very clear that they were not obliged to join the study and could change their mind at any time. The other side of this was being free from pressure to submit or focus on particular ‘findings’ which would strengthen the position of the donor, my then employer, with regard to promoting the INS programme or glossing over any challenges which came out of the research. This has been mitigated through dialogue with UNHCR and Vodafone Foundation, and through the development of the rigorous research framework.

Zajda (2010) suggests that the following should be taken into account when considering the ethics of the research design, and the position of analysing findings, and I have used this framework in guiding my own thinking;

1. That the models and vision of social justice and inclusion will be different across cultures;
2. That the human capital approach to education is the global norm, and that a social justice reading should be prepared to interrogate the value of education; and,
3. There are operational concerns about transforming teacher practice and about developing sufficient understanding of teachers’ own capacity and ideology.

These framed my approaches to identifying and discussing the findings.

4.10 Limitations of the Study

Many of the limitations of this study have been introduced in this chapter. The major limitation is in the amount of engagement I was able to have with respondents, and the amount of data generated. Whilst 21 interviews is a sufficient sample, representing about 12% of the teachers across the target schools, it is insufficient to make generalisations. My focus is not on making generalisations though, but on

creating rich pictures of participants' lived realities. Bloomberg and Volpe (2008) view credibility as how well the representation of participants by the researcher balances their perceptions. A limitation of this study was my inability to return to Dadaab to undertake a member checking exercise whereby participants would have had an opportunity to validate my representations. Whilst I must acknowledge the limitation that comes from lacking this final approval, I take the position that the study is validated through the 'how': the use of a robust research design which is sufficient to consider a qualitative case study to be credible (Merriam, 1998; Lincoln and Guba, 1989).

In addition to the limits to the number of people I could speak to, the logistics and security challenges in the camp meant that the research instruments I could use were also limited. Many activity theorists undertake observations, but classroom observations were not possible because of the security protocols which reduce time spent in schools in the camp, and time spent in 'open' spaces like a classroom rather than in a locked teacher office. These restrictions on freedom also meant that I was unable to form more natural relationships with teachers and other education stakeholders. Another limitation is that this case study is not longitudinal, and whilst having a snapshot in time is a valuable contribution to knowledge on the subject, it was not possible to interrogate changes in perception over time. Whilst this partly relates to the dynamic nature of the refugee camp, it also relates to the time I had available to conduct research in Dadaab. These two challenges removed the possibility of using virtual research tools such as online questionnaires which were piloted, with a zero response rate, during the pre-pilot and pilot phases. The irony of this being the case within a study about the perception and uptake of technology is not lost on me.

During the design and the pilot phase, I had envisaged a much grander study. Exploring the perception of technology between teachers who are engaged in the INS project and those who are not; comparing across multiple refugee camps; and other comparisons to review impact are all exciting areas for research. I chose to limit this study, however, to a small window of teacher perception within one technology-based programme in one – relatively homogenous – refugee camp. In spite of these limitations, the amount of data and the richness of this story makes up for the limits of

possible scope. Opportunities to conduct additional research will be discussed in the conclusions chapter.

4.11 Chapter Summary

This chapter has outlined the methodology, starting with my conceptual framework and presenting the research design within this framework. The selection of research questions, instruments and analytical approaches were explored. The ethical implications were considered, with a focus on undertaking research with vulnerable refugee populations, in a situation where I was in a position of power. The chapter ended with a reflection on the limitations of the study, and what was achieved in spite of these.

Chapter 5: Findings

5.1 Introduction

The chapter will present findings in the following way:

1. **Setting the context:** presenting the respondents' description of the inside of an Instant Network School;
2. **The activity system under investigation:** presenting the system of the Instant Network Schools in Dadaab, building on the foundation of the activity theory model. This section identifies what the specific nodes or elements are (subject, tools, rules etc.) within the studied system;
3. The chapter then presents the findings under each research question. This study focused on the overall question: 'What are the teacher perceptions of their engagement in the Instant Network Schools programme in Dadaab refugee camp?' In exploring the findings, I aim to answer the research sub-questions:
Research Question 1: What do they perceive to be the benefits of their involvement in the programme on their teaching and learning?
Research Question 2: What is the impact on teacher motivation?
Research Question 3: What do they perceive as the benefits to students?
Research Question 4: What do they perceive to be the constraints or barriers to their optimal use of the programme to support teaching and learning?
Research Question 5: What are the development needs for optimal impact of the programme? (i) At the level of the individual teacher (ii) For professional development activities and opportunities, and (iii) For modifications to the programme design?
4. A summary of key findings.

Use of Activity Theory in understanding findings

There are two key areas of activity theory which have influenced the analysis of data. The first is the use of nodes which are the different elements – actors, relationships, tools, structures – of an activity system. The concept of nodes in activity theory is more fully explored in pp.68-73, and further in the analysis section which discusses the

coding of data using nodes. I will present findings structured under activity theory nodes of subject, object, tools or mediating artefacts, rules and norms, community, and division of labour (Engeström, 1987, 1996, 2001; Guy, 2005; Mwanza, 2002). Secondly is the focus on tensions and contradictions across the system, including within and between nodes. Exploring these tensions is one of the activities suggested by activity theorists (Engeström, 1987; Nuñez, 2009; Virkkunen and Kuutti, 2000) who posit that transformation and change emerge through contradictions and tensions.

Use of quotes and vignettes

Whilst the main text of this chapter is my own reflection and findings, I have also included verbatim quotes in line with Mishler's (1986) position that presenting respondents' own words contributes to the validity of a study. Quotes are attributed to a pseudonym which shows gender: a table on pp.93-94 notes whether the teacher was primary or secondary, and a refugee incentive or a Kenyan national teacher. For depth, I have also included vignettes as boxed texts where they are included as 'illustrative stories' (Thomas, 2016, p.180), clarifying a particular point or experience. Vignettes included in this chapter are mostly paraphrased quotes to ensure clarity of language, with some additional detail from my field notes of working in the camps. Because of the challenges of the language, and in order to include the richness of field observation, these vignettes give a chance to include short stories about the respondents and the schools without interrupting the text.

5.2 Inside an Instant Network School

Those schools in the Dadaab refugee camp who were involved in the research have been considered as the 'activity system'. Whilst each school is itself a system, the resources and relationships of the Instant Network Schools programme mean that the group of target schools also creates a wider activity system. In interviews I asked respondents to firstly share a picture of their schools and the communities they serve. The vignette below illustrates school life at primary level:

Vignette 1

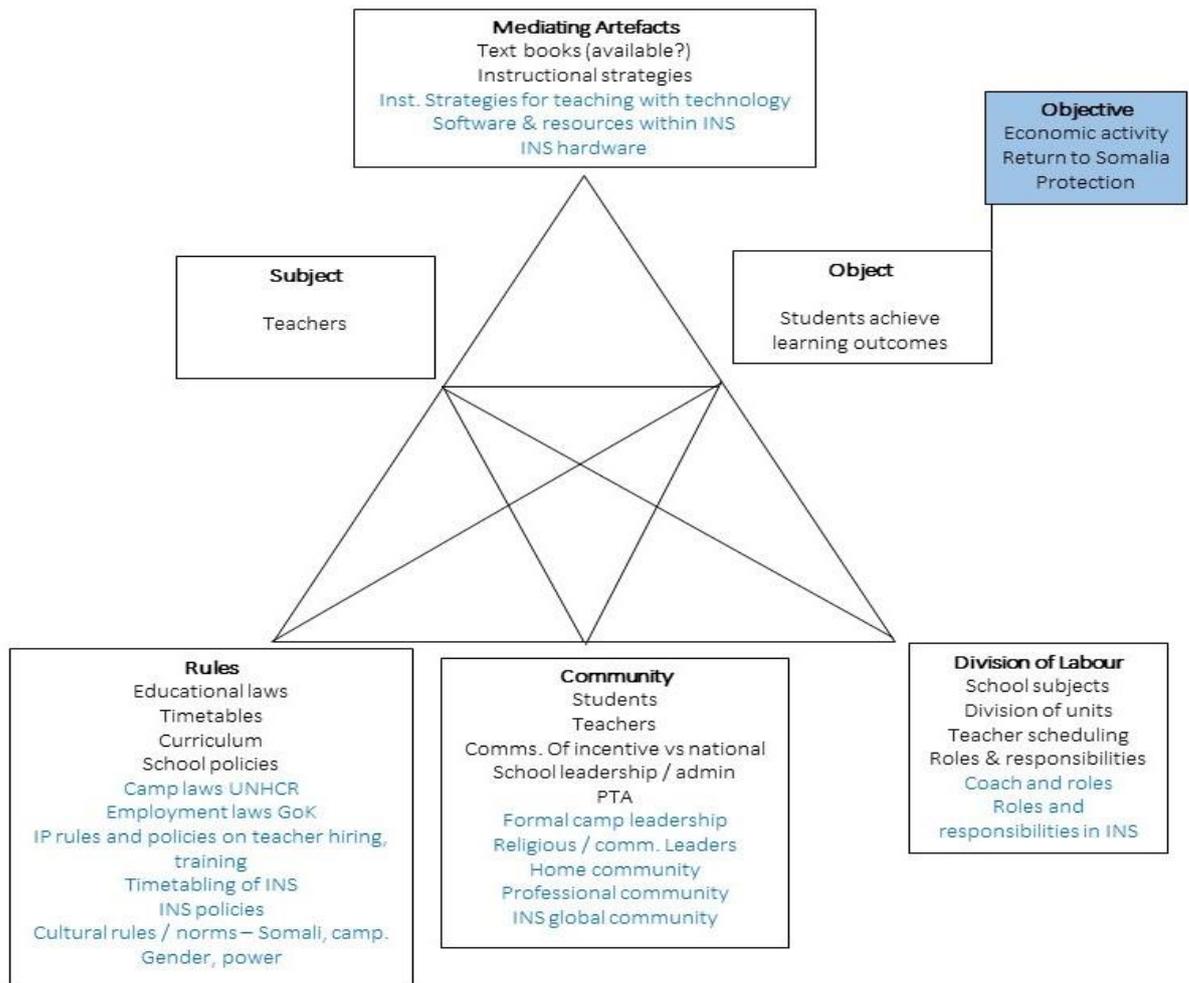
Portrait of a Primary School: Salih and Abdi, incentive teachers

Salih and Abdi are teachers in one of the oldest primary schools in this camp as it was established around 1992 when Dadaab was created. Abdi noted, 'It is so old, even I used to learn here from when I started Class 1 up to completing Class 5'. Today it is also one of the largest, with around 3,000 students of whom around 60% are boys. This is above average for enrolment of girls, which Abdi attributes to the additional programmes to support girls in the nearby community. The students are supported by 42 teachers (giving a teacher: student ratio of 1:71), which includes four Kenyan national teachers. Staff are proud of the age and size of the school, viewing it as both an important institution and a landmark due to it being a 'storey building' which is unusual in the camp where almost all the buildings are single-storey. School D is in a strategic position which impacts on the enrolment numbers as there are a few local schools: 'simply, the school is located in the biggest section in the camp... and it's the only school we have here' said Salih. For the Instant Network Classroom, School D experienced a range of challenges throughout the life of the programme. There were particular issues with the tablet computers: the school received a different brand of tablet to the others (Mercer tablets running Microsoft Office rather than Android tablets); and the internet connectivity had not worked at all from the start of the programme period up to the end date of this study (September 2014 – March 2016). Because of the tablet format, the school were unable to access offline content, and the devices had been left in a secure cupboard and not used during the period. In spite of this, Salih feels that the programme is important to the students and to the community, saying, 'This ICT centre is very important for us... Parents come to see how the INS is running and they appreciate it. We feel we are better than other schools that don't have such chance.'

5.3 Analysing the activity system

This section presents the activity system under review (a school setting in Dadaab where the Instant Network Classroom has been deployed) aiming to describe how each element of the system looks in this context. I mapped the nodes in the researched activity system of schools in Dadaab which are part of the INS programme (see Figure 7, below). Here, I will present the findings under each node, reflecting on the detail of each and relationships and tensions between them. Examples of tensions include those between the design of the activity system and how it works in practice. This section

offers a typology of the findings in line with the literature review recommendations on activity systems, and acts as a contextual framework for the findings. Using the data, I mapped the activity system against Engeström's (1991) second generation model of an activity system:



What constitutes each node was based on the findings from the data:

Subject: teachers

Engström (1990) defines the subject of the Activity Theory triangle as the 'individual or sub-group whose agency is chosen as the point of view in the analysis' (Engström, 1990, p.79). This study focuses on the agency of teachers involved in target schools, and they form the subject of the activity system. Whilst the subject is in one sense the participating teachers in the study (n=21), in another sense the subject is 'teachers involved in the INS project'. The incentive teachers in particular talked from the

perspective of being part of a community of teachers, and part of a unique cadre of people with a calling:

I like teaching because it's a noble work; I think teacher is the only person who serves the community in what they basically need the most. Because, for one to be independent he has to learn and a teacher is the one that is giving that knowledge, so that's why I see teaching is the basic foundation of the community, and that's why I like teaching.

(Yahyah, Primary, incentive)

In particular, findings from this research are likely to be relevant to other teachers in the INS Programme, and also to different stakeholders designing technology-based interventions in refugee settings. Based on respondents' self-description and using the attribute coding, I created a categorisation of teachers:

- National teachers with national teacher training qualifications [N=4];
- National teachers with non-teaching degrees [N=2];
- Incentive teachers with national teacher training qualifications [N=1];
- Incentive teachers with Certificates or Diplomas followed through refugee scholarships [N=3];
- Incentive teachers with non-formal refugee training [N=11].

The different perceptions of teachers herein are explored throughout the findings and discussion sections where this relates to a lack of congruence across respondents.

Object: Students and student learning outcomes

In this activity system, the object is the approximately 14,000 students who attend INS schools in Dadaab where the research was conducted. This is a diverse population, covering primary and secondary schools, different ages, nationalities and gender, and different personal histories as a refugee. The 'objective' of the activity system is complex: as with most school-based activity systems, the objectives are student retention, learning outcomes, motivation and behaviour. In addition, there are motivating factors around supporting students in overcoming the hardships of their early years and current situation; encouraging enrolment of new students; and preparing them to be ready to return home. Whilst the dynamic statistics in the

schools make it hard to have exact numbers, 95% of these students will be of Somali origin, and whilst exact numbers change across schools, age groups and time of year, around 36% will be girls (UNHCR, 2016).

Tools

The respondents in this study talked about a number of different resources which I identified as tools;

- The tools and artefacts that were considered part of the INS programme, including the specific hardware set-up and digital content;
- Traditional resources including books, teacher training materials and libraries; and,
- Mediating tools throughout the school, including infrastructure such as furniture.

Of these, the first two will be explored more thoroughly in this section as they relate to learning and teaching materials, and shed insight into teacher perception of these where they are digital or otherwise. The latter was key to understanding the different set up and specific challenges of the INS classroom in each school.

Discussions were around a range of themes with a focus on how the tools are used in that setting. As Wertsch (1985) notes, ‘...the study of mediation and mediated action cannot focus solely on the cultural tools involved. Even the most sophisticated analysis of these tools cannot itself tell us how they are taken up and used by individuals to carry out actions’ (Wertsch, 1985, p.22). In addition, significant information was gathered around descriptions of the INS tools as they exist in that particular school. The interviews included specific questions about the tools and artefacts of the INS programme, to better understand how teachers and communities worked with them and also to pinpoint challenges which might have a specific impact on different schools or settings.

Communities

Using Yamagata Lynch’s definitions (2010) this section focused on the community around the teachers, where key community members are teachers (subject) and

students (object), and parents and school administrators are considered crucial because the objective also impacts on them. There are communities at different levels:

- The 'whole school' community, including parents, students and teachers;
- Teaching and school administration staff;
- The organisational community, including the implementing partner responsible for managing the school, and the Vodafone Foundation as a donor;
- Dadaab, which includes other schools and community leadership structures;
- Perceived national communities, including Somalia and the diaspora for many refugees; and 'down Kenya' (essentially the rest of Kenya) for national staff as well as some refugees who have lived in the camp for many years.

Based on the literature around education technology, I had anticipated that there would be additional 'virtual' or online communities, but these were not raised by any of the respondents taking part. There were references to a global, digital world which are explored below, but this lack of an additional external community is further explored in the discussion chapter (pp.148-163). I had also anticipated a community of practice which brought together all the schools with INS Classrooms in Dadaab and probed around this during the interviews, but this was also not apparent in the data collected.

Division of labour

The major issues in this node of the activity system related to the role of Coaches, and how the teaching community managed the workload and tasks relating to the INS classroom. There were key tensions here which were felt across the activity system, and which have the strongest implications for future practice. These related particularly to the role of the Coach, and the relationship with the school administration.

Rules

Explicit rules guide both the management of schools at macro and micro level, and the daily life of teachers as employees. These include the use of the Kenyan national curriculum which is used by the majority of schools in Dadaab as it is the only way for students to access certification. There is a tension between the need to follow the

curriculum and a lack of understanding how to creatively access and utilise resources which are not directly approved or created by the curriculum authorities. There are also rules governing the management of the school in general, and policies which frame the specific use of the Instant Network Schools classroom and tools.

5.4 Presenting findings against research questions

Research Question 1: Teacher perception of benefits

Research Question 1: What do teachers perceive to be the benefits of their involvement in the programme on their teaching and learning?

Changes to teachers' workloads

Every respondent talked about ways in which the programme had benefitted their teaching work in terms of work load, freeing up time from mundane and repetitive tasks and administration. This included the ability to create materials which could be used more than once such as class notes, though this was sometimes with examples of when this had happened successfully, and sometimes as a perceived benefit that they had not yet realised. Whilst there were some challenges in the saving and sharing of such materials, there was a sense that this was one of the main exciting possibilities of the programme and of technology in a school setting overall:

My work has been made easy, because when I make the notes, or when I have soft copy notes I have them in bullet point form... I do a back-up as well so that means that the next year I will not need to do new notes, maybe I'll do a few edits and present the same notes over and over again.

(Ali, Secondary, Incentive)

It was interesting that this was noted as a benefit even by teachers who had been unable to do these tasks for themselves, usually because of a noted lack of hardware, software or internet connection: the perception was enough to report it as an improvement to their teaching workload.

Out of all the respondents, only the four teachers who were also Coaches complained that the INS had created additional work, and that was because these were the staff who were charged with taking care of the INS hardware and supporting their

peers in utilising the tools. During the field visits, significant challenges were reported in the role of the Coaches, and a tension between the needs of the programme and the understanding of the external management (Vodafone Foundation) and the implementing partners managing the schools, plus the school administration. During the initial design of the programme, schools were expected to free up the time of a staff member in the school to become a full time Coach, who would act as the Librarian or Lab Assistant to the INS; training other teachers; supporting them to find and utilise content; and managing the INS around security, maintenance and reporting. Disconnects around this role were a central tension in the activity system of the schools which had INS classrooms. There was a feeling that this was stuck between the implementing partners who felt unable to provide a full-time teacher for this role; and the INS management who understood that the project has little chance of success without it but were unable to provide additional funding. Into this vacuum, those people selected as Coaches at the outset took on the role alongside their teaching commitments. All the respondents agreed that this was a huge challenge, both because they were overstretched, and because there was insufficient support available to the school. Recognition of this tension was common to both teachers, Head Teachers and school administration, who recognised the limitations of the resources they had.

Improving the physical burden of teaching

A common response was teachers reporting perceived physical positive effects of the INS, which removed the need for chalk, writing on the board, and other energetic aspects of preparing for and delivering a class:

Teachers benefit from the INS programme because before they used to write their lessons to the blackboard. The chalk is very harmful; and it's tiring and wasting time. (Mohamed, Primary, Incentive)

For me this was a surprise, as at no point in the time I spent in the schools or with the teachers had chalk dust or physical effects of teaching been discussed, other than overall tiredness. This sense that teachers appreciated the removal of some of the burden of unnecessary energy used in their classroom practice was also common, and was shared by the Head Teachers who felt that there was a benefit to their staff:

We use energy to do all the things: energy to write on the board, energy to explain. So if that teacher is told not to write lessons on the board he has retained his energy to explain and will have motivation.

(Adam, Primary, Incentive)

Around two-thirds of incentive teachers reported their improved energy levels as a motivating factor, as they had to spend less time writing on the blackboard and being physically active in class. From the interviews the reasons for this were not clear, but the contextual knowledge that many incentive teachers also work other jobs, along with the physically demanding life in the camp which involves collecting food rations and water without infrastructure or transport means that it is not hard to imagine why teachers are keen to conserve their energy.

Improving access to classroom materials

Overall, there was a positive perception that the INS tools were able to supplement a lack of traditional school resources, and to provide access to materials that were otherwise unavailable. Whilst some teachers from secondary schools – which have much smaller student numbers – felt that they already had fair access to school books, the majority felt that they lacked key resources:

Here, text books are not really enough, so sometimes there are only five text books and we have around 65 students in the class so it is actually really difficult to keep them all on the same task.

(Ali, Secondary, Incentive)

Others, particularly two Kenyan national teachers who had previously worked in schools outside of the camps, expressed the perception that this gap could be filled by digital content made available through the INS Classroom. In addition, teachers expressed that the provision of resources on the tablet computer made materials easier to use as different resources such as text books, grade readers, videos etc. were all made available in one place, limiting the amount of time they had to spend gathering resources together:

When it comes to the tablet [computer], all the content you need is there, all summarized in one place. Compare this to the text books: to bring the same amount of information you'll need to bring piles of books.

(Esther, Primary, National)

However, when questioned none of the teachers used the eBooks on the tablet, or downloaded additional books. Some expressed an interest in the possibility but were unable to be specific about which texts they would like other than a general sense that books approved by the Kenyan government in-line with the curriculum should be available. Only one teacher, a secondary English teacher, named specific books that she would like on the tablets, and this followed some prompting. They were also set texts for literature which is only used at secondary level, rather than more standard text books. There was a strong feeling that the technology aspect made tablet computers better than books, and that the provision of additional text books would not perform the same function. This was largely because of the range of information available on the tablets, and the ability of the brightest students to engage with information above and beyond the prescribed text books.

This was echoed by five incentive teachers, who had a sense of the limits of their own knowledge having been raised in Dadaab and now teaching within the same education system. The ability to support both stronger and weaker learners, especially in a large class, was seen as a key benefit of the intervention (see p.129).

Of the 21 respondents, only three reported using the Apps and software that came pre-loaded onto the tablets, and those which were used included dictionaries, calculators, and basic letter and number games for children in early grades. Whilst the tablets were loaded with a suite of learning materials in English and Swahili, including instructional videos, these were not used. Even Coaches who had attended training in using the tablets, where they were shown the different content and how to access it, reported not knowing about it. Two Coaches said they had heard of Rachel as the offline digital content repository, but believed that it was not available to them. On checking the tablets, it was found to be installed. Whilst five of the refugee teachers mentioned the Somali-English dictionary application as a key tool, one of the Kenyan teachers criticised the use of any Somali language in the school setting, which from a curriculum perspective can only be taught in English and Swahili, saying:

When they are teaching, refugee teachers speak Somali but they should know not to do that here... you need to restrain yourself and not speak mother tongue to your students. These students, let them talk English and Swahili because at

the end of the day they will be examined in that. There is no paper that will come in their mother tongue. (John, Secondary, national)

This may account for a lack of additional reported use of the dictionary facilities. The insight that this quote also gives to the tensions between refugee and Kenyan national teachers is further explored in the discussion chapter.

Google was the most talked about tool with more than half of teachers reporting that they both used it themselves to find additional content, usually videos; and encouraged brighter children who had finished their work in class to 'Google' and find additional information on the subject in hand. 'Google' was used very much as a verb, with a clear tone of approval that students could research and work alone. This raises questions about the suitability of this task, and whether there was a clear understanding of the risks and limitations of search engines and finding content which had not been quality assured, but when prompted these concerns were not immediately shared by any of the respondents.

Videos were the most discussed item of content. All the respondents mentioned video in some form. This was most regularly linked to the challenges in trying to describe or explain things which are completely outside of students' lived realities, such as geographical features as shown in vignette 2, below:

Vignette 2: Charity, National teacher, Secondary

Travelling without visas: discovery in the classroom

Since the Vodafone Foundation Instant Network classroom was brought to our Secondary School, I've been able to help the children use technology to discover things for themselves. When we need resources, such as videos and photos, to benefit the class, the children can find them. It has made the class so lively - and they respond really well. Although there has been some confusion. For instance there was the time I was teaching one class about Fort Jesus and, when I took them to the classroom to use the tablets, they asked, 'How can you learn history with technology?' But when we got started, they were so excited. I had their full attention and they would not even leave to take their lunch break. They asked me to keep the projector on and to show the video again - and they all stayed in the class, spellbound. Access to technology is increasing the students' knowledge of the diversity outside of the camps. Children, especially those born in the refugee camps in Dadaab, suffer from isolation, and a lack of connectedness. The link to the outside world helps them to know that the world is not at a standstill, and that there are options and opportunities for them. It helps them begin to make the changes that they will need to prepare themselves for life outside of school, and maybe outside of the camp. And, most importantly, it has raised their aspirations.

Three respondents mentioned English as one of the classes that benefit from videos, as these are the only way to access native speakers within the school setting. This ability to give classroom support which would otherwise be unavailable was mentioned by a significant number of primary school teachers, where they struggled to teach an aspect of the curriculum:

In English they mostly use it to show videos to the students, the set books videos and for some forms, the pronunciation. The Somali students they are not able to pronounce like the letters 'P' and 'B' so they use it to help them with pronunciation. (Vanessa, Primary, National)

Research Question 1: Summary

Respondents found a range of benefits from their engagement with the programme, with the majority being improvements to their daily work as teachers. Specifically, the ability to use technology to prepare lessons, maintain a library of resources in a low resource environment, and rely on this to reduce the burden of teaching were identified. However, there were tensions in the use of the digital tools where, whilst there was an overall perceived benefit to the artefacts made available in the schools they were only used in a minimal way. Many teachers identified that the engagement of students was also key to their perception of benefits, and this is further explored in Research Question 3.

5.5 Research Question 2: What is the impact on teacher motivation?

Object-orientation and a virtuous circle

The majority of refugee teachers identified a cycle of exposure to the technology and teaching materials through the programme which then improved students' learning experiences which in turn motivated them as teachers. The majority clearly expressed the object-orientation of the activity – the concept that teachers' activity is focused on the impact on students – with a focus on benefitting students, and saw the growth of their own motivation and skills as a side effect. This was articulated in a range of different ways, with a focus on the engagement of students and an improvement in their learning, as well as the impact such improvements have on the teacher. This was well summarised by one primary teacher who said:

When they see the learners are happy the teachers will also feel happy. Last week when I was teaching English, the whole class begged to have extra time in class! I see the learners laughing and they are participating in class... but if the class is lazy and unhappy, I also feel unhappy.

(Hamdi, Primary, Incentive)

This related to the perception that the tools freed up time for them, both in preparing their classes so that they were motivated, but also during the lesson itself where time usually spent writing up notes on a blackboard and managing this for the different paces of learner could be used instead to actively engage with students. Two main benefits were noted: that teachers felt they covered more of the subject and were able to go more deeply into sub-topics, and that they were able to devote additional time to learners who were not understanding the content well.

Bringing teachers in to be part of the 'developed' world

There was a sense that the INS programme is bringing the teachers in-line with others in more developed areas – either 'down Kenya' where schools have more resources, or globally. Many teachers mentioned that 'this is the world of technology', or 'this is the 21st Century'.

There was a sense from the Kenyan national teachers, that the additional skills and knowledge from the INS Programme would benefit them in the future and was somehow a welcome counterpoint to the additional burden they felt from teaching in Dadaab:

I have really benefited because it has made my teaching really easy because I feel advanced, technologically. If I get out of here and go elsewhere to teach, I have new skills and I can easily find a new position. (Charity, Secondary, National)

Refugee teachers noted their own pleasure in using the equipment outside of school hours, especially given the lack of media and resources in Dadaab, and this was noted by their Kenyan colleagues who viewed it as a positive:

The teachers are very happy, even some times they take their own time to search online. If there is any recent news they just sit down there in their own free time... they can get updates on what is happening in Somalia, they can watch a particular event which has happened in Kenya: it is a good thing.

(Faith, primary, national)

Research Question 2: Summary

It was challenging to distinguish between teachers' perception of the benefits of the INS programme, and the impact on their motivation. Teachers reported feeling more motivated and appreciated through their engagement with the programme, particularly with the feeling that it brought them into the digital world. For refugee incentive teachers, this focused on the ability to communicate outside of the camp and a decrease in feelings of isolation: for Kenyan national teachers, it was more as a mitigating factor to being in Dadaab, and that it would benefit their teaching careers when they leave the camp.

5.6 Research Question 3: What is the perceived impact on students?

In the initial research design, this question was intended to be asked directly to students, with answers triangulated around attendance, enrolment and learning outcomes using education management information. The dynamics of the data, and the changes in the overall situation in Dadaab meant that it was not possible to work directly with students or to have confidence in external data from schools. It is also challenging to mitigate for external factors: for example, whilst some schools grew in enrolment, overall numbers went down term on term in line with Dadaab's reduction in overall population which reduced by almost half during the period of study (UNHCR, 2017c). With these challenges in mind, the findings from this research question focus only on teacher perception of the impact on students.

Student attendance

There was a clear common narrative here: all teachers reported that the INS leads to increased attendance. Across Dadaab, attendance is very low, being impacted both by dynamic movements where pupils will be away for weeks at a time; and also by daily chores and requirements of the household, where they may be regularly away for parts of the school day. Many secondary school students are overage and already married, meaning they have an additional set of responsibilities and tasks. Whilst this is respected by the teachers, they reported finding the regular absences frustrating. Three of the Kenyan teachers noted that they found significant challenges teaching in the refugee context, recognising that difficult home circumstances meant that students were

often late or absent, or struggled with concepts that they might not have built up in foundation stages and where there are no additional resources for catch up or enrichment. All teachers noted that the INS increased motivation and interest for the students, and this in turn led to greater attendance:

There is a very big difference between the start of the INS programme and now. Two years ago the attendance in class was much lower... INS has really increased the attendance. When the students know that there is an ICT class, using the time table they are really motivated to come to school that day. (Liban, Secondary, Incentive)

This was turned to the teachers' advantage. A common strategy was noted in three schools where classes in the ICT classroom were timetabled for after lunch to ensure that students returned after the break. In another, a teacher scheduled her sessions for Thursday afternoon, and only admitted students who had attended for the whole week. On probing however, it was clear that improvements in attendance have not trickled out into the rest of the school day. The same respondent who celebrated the increase in attendance in her classes held in the INS Classroom also noted:

Specifically they know today we have mathematics and ICT - they will come. Most of them will come, then in the afternoon when they don't have an ICT lesson, most of them will disappear. After lunch they will run away and just go home. (Charity, Secondary, National)

Student enrolment

Another area of congruence in perception across respondents was that enrolment to schools which have an Instant Network Classroom significantly increased. Most of the teachers talked about this with a sense of pride, and noted that the dialogue between students from the school who talked to their friends and family, and their own outreach with the community:

When they go home they will tell other learners that they have ICT class in their school which is very interesting. And then the community will ask us... 'we are told you have ICT in your school so will you help our children to go there'?

(Salih, Primary, Incentive)

Respondents also noted a down-side to this, as the majority of students were not new enrolments from children who were out of school but students who were requesting transfers or enrolling in the school even though it was not their closest one. Whilst they were proud of this positive perception of ICT and the new facilities that the project brought, there were also significant challenges in the increases in student numbers without corresponding increases in infrastructure. This was seen as a disservice to other schools who should also be supported, and a possible point of tension within the community as they would not be able to admit unlimited numbers of learners:

If possible, please extend the INS programme to other schools to avoid transfers. Now some schools have lucky learners but others want to come and have this opportunity. Now they are transferring and increasing the population of that school. And the teachers they remain the same, there is no increase in man-power. (Gurhan, secondary, incentive)

Much of this suggests the novelty value of having the INS programme in a school. Across the respondents, there was no clarity on whether the interest was sustained, and the inability to talk to the same teachers multiple times made this difficult to analyse. Overall there was a greater sense that the intervention was unfinished as many schools lacked stable internet or electricity, or few had the impression they were using the finalised list of content. There was very much a feeling of being in a pilot phase, which would explain the lack of focus on exploring sustained interest.

Student interaction and engagement

All respondents reported an increase in student engagement: in the teachers' own ability to interact with students during class time, and in the students' taking part in the lessons. Improvements in student behaviour were also pinpointed, though classroom management remained a challenge according to teachers' perception of their own abilities. As shown in vignette 3, one area noted in a number of responses was that the time on task accorded in the INS classroom was much greater because the students were focused on the activities with the tablets, freeing up the teacher to work with the different ability groups. This was perceived as a pedagogical shift – that there had previously not been the opportunity to undertake real student-focused learning because there simply was not the time. When teachers talked about their use of the INS

Classroom, this perception of supporting child-centred learning was focused on the time spent supporting group work with the tablets. This was particularly the case in the primary schools where the classes are much larger, and group work was the only way to manage a class of 75 sharing 25 tablets. Whilst this was raised as a challenge, there was also a sense that having a class work together in this way, with the teacher moving between the groups, was beneficial.

Vignette 3

Supporting the weakest and challenging the brightest: Faith, national teacher, primary

The INS truly changes the way the teacher gets time to teach each learner. Normally when we are teaching our time is spent writing on the board then giving an explanation and managing the class as they try to complete an exercise. We work with the class sharing materials like text books, and the teacher is responsible for making sure that everyone is doing the same work. But the tablets help us to be much more directive, and to direct the attention of the students to the work which is relevant to them. Sharing the tablets is better than sharing a text book in class. When you have faster learners, you can put them in a group and find them more challenging work on the tablet; likewise when you have slower learners they are more comfortable when they are in a group at their level with exercises they can follow. Because the software is interactive the students are busy, and the teacher is freed up to move around the class and make sure that students are working at the right level and they are able to keep up with one another. Through this our way of teaching has really changed. Having to focus on the blackboard and on classroom management only meant the lessons were teacher-focused, not child-centred. Now it is child-centred and the teacher is able to give more to each student: in this way both the teacher and the students are motivated.

Student learning outcomes

Because of the data challenges in Dadaab (see pp.13-14) including dynamic movement of students and lack of coherent data collection, and because it is impossible to attribute change at student level to the INS programme rather than other factors, it is very hard to assess whether there were meaningful changes to students' learning outcomes in

national or school tests. However, all respondents felt that the INS supported students in improving their knowledge and skills, both in curriculum-based subjects and in the use of ICT:

The INS Classroom helps the students achieve their goals and know more things and get exposed to the world. They are much better than they were before. You know before it came most of us we were basically so behind but now that it's there our students are exposed to a lot of new things. (Sami, Secondary, Incentive)

The exam results for 2014 came in during March-April 2015, and I compared these against the results from previous years. Students in Dadaab are able to take the Kenyan national exams: the Kenya Certificate of Primary Education (KCPE) at Standard 8, and the Kenya Certificate of Secondary Education (KCSE) at the end of Form 4. Instant Network Schools showed marked improvements across these exams, and speaking to the teachers during field visits at this time, they were excited to have used the centres for revision and preparation.

In KCPE, in which students from four IN Schools competed they found:

- A 41% increase in students achieving top grades;
- A reduction by half of the number of students who failed or were absent.

In KCSE, in which students from two IN Schools competed;

- One of the schools showed the greatest increase in top scores of all the schools in Dadaab, with a 300% increase in students achieving grades A-C+ - the grades which qualify them to go to University;
- Both schools showed a marked increase, up to 60%, in the number of students achieving grades C-D, which allow them to go to technical college.

Whilst these increases were good, they were similar to increased performances across schools in Dadaab. Insufficient research was undertaken across the camp to posit here which factors had led to these increases, but reflection from the interviews undertaken show that teachers perceive some of this change can be attributed to the INS programme.

Reducing student isolation

Almost all teachers mentioned the ability to access learning materials and the Internet as a positive benefit in terms of both exposing students to new things to reduce their isolation as well as improving learning outcomes. Videos were particularly mentioned (see also pp.126-127) with a real sense that videos had a positive impact on students in terms of 'seeing' or experiencing things which were unavailable to them in the camp. This was seen as leading to a type of cognitive dissonance, where students were asked to believe (and understand, remember and be examined on) things which they could not know or experience personally and were unable to fact check outside of school. This was crucial because, unlike traditional school books which could be made available if the money and logistics were organised, the ability to experience something could never be availed in that way:

You know here [in Dadaab] it is very flat, and it would be hard for you to convince a student there is something called a mountain. So you look around and say, 'think of an anthill, and multiply this a hundred times'. This is the only thing you can think of that will make sense to them... Now, instead of me taking them to an anthill and telling them to imagine it, I go to the tablet, I get the clip of a mountain and then I show them the clip and I showed each one of them.

(Charity, Secondary, National)

This linked closely to the perception of isolation and refugee status for the students, and how this impacted on their ability to learn the things which were in the Kenyan curriculum but which were totally unfamiliar within their current context.

Research Question 3: Summary

Overall, there was a perception that the INS Programme had a significant impact on students' learning outcomes, enrolment and attendance. Whilst all the teachers reflected on these areas, they were also clear that there were limits to these increases. For example, the improvements in attendance were often only found specifically in the classes held in the INS Classroom, and did not increase students' attendance in other classes. The data challenges within Dadaab whereby the education management information system is incomplete and unavailable, and where the dynamics of population movements can mask shifts in enrolment and learning outcomes, means

that it was not possible to triangulate any of these perceived benefits and my findings are inconclusive. However, the teachers' *perception* of these benefits impacted on their positive perception of the INS programme.

5.7 Research Question 4: What do teachers perceive to be the constraints or barriers to their optimal use of the programme to support teaching and learning?

The baseline of student engagement and support

Student participation in class was seen as a challenge by most respondents, noting that this relates to both the classroom size and obstacles to learning within the school infrastructure, as well as the students' backgrounds, as 'They've gone through quite a lot. So mostly their concentration is not even in class; their attendance is shaky.' (Sami, Secondary, Incentive). The schools have few resources to work with students who have special or additional needs, such as those with psycho-social needs which may be linked to the trauma of becoming a refugee; those with caring or other responsibilities at home; or those who are gifted and talented. All respondents noted that individual students might have a range of challenges:

Some students do have good skills, especially those that used to attend primary school regularly... You have to ensure maybe have to talk to them after school often, then they will tell you about the challenges they are facing... They might come to school in the morning then say 'Teacher, I cannot come after lunch. My wife is sick. I need to take her to hospital'. The extra needs they have can be quite challenging. It's a lot.

(Vanessa, Primary, National)

Respondents, in particular Kenyan national teachers, echoed the cumulative impact of low support and attendance throughout school careers, where students have not learnt the basic skills they need to master more complex skills and concepts. This becomes increasingly apparent at secondary level:

The main challenge in teaching these students is though they come today, they may not come tomorrow. In subjects like science when you learn and the concept step by step, you will find that it will be very difficult for that student to understand the concept which started when he or she was not in school.

(John, Secondary, national)

Identity and cross-cutting dynamics

To answer the research questions, it is necessary to understand the dynamics of the activity system and how the subject perceives the object and is able to be oriented towards it. These may be existing 'constraints and barriers' and provide opportunities for developing the programme in such a way that it addresses these. One of these is gender, which was discussed by a number of respondents. Overall, there was a reflection that girls were less likely to be enrolled in school or to regularly attend, which is also reflected in the existing Education Management Information System data for the schools which shows that only around 36% of students are female:

The girls' attendance is good, but the number of girls is really low. It's less than a quarter of the school's population. Because of their culture - their cultural beliefs: early marriage, house chores, it's quite difficult for them.

(Charity, Secondary, National)

In interviews and in discussions during field visits, teachers reported a perception that girls were inspired to use the INS Classroom. On probing, this was not backed up with specific examples but more by a sense that the classroom was more able to mix during the sessions in the INS Classroom:

The other thing is that gender inequality. Probably some teachers for the community where we are living, most of them are Muslims so normally the girls sit at this side and the boys sit at this side. But when you are teaching during the ICT class the students are intermingling. (Faith, Primary, National)

Another key area around identity was that of the perceptions of students (and fellow teachers) based on whether they were refugees and in particular where they were Somali. Whilst there is a common desire to teach all the learners, there was a significant difference in perception of students as 'refugees' and as children with specific, largely Somali, cultural heritage, between Kenyan national teachers and Somali refugee teachers:

60% of Somalis here are educated so and when they go back to their country Somalia, they'll support themselves and their country as well.

(Ali, Primary, Incentive)

Lack of confidence in their knowledge of the tools

Whilst teachers talked about their enthusiasm to use the tools in the INS, challenges were perceived in terms of their ability to use them. This was articulated both in terms of confidence, and around the power relations between them and their students, where they need to have something to 'share'. This is further explored in the discussion section as it relates to teacher perceptions of learning and teaching, but here the common point was that teachers cannot do or teach something they are unfamiliar with. This also relates to the power position of the teacher as leader in the classroom who needs to command respect:

For you to teach learners you must get a lot of knowledge yourself. I normally go to people who know computers very well and I learn from them. Then I come here and use the knowledge I learned to help my learners and thus it made me confident. (Ayoob, Primary, Incentive)

There was a feeling that they were unable to share their knowledge of the tools, and some requests for training to be given directly to the students so that they are prepared to then use the tablets in class, whilst the teachers focus on the delivery of the lessons.

One common theme was that there was not universal confidence in the tools, either from the teachers or from the students. This perception led to teachers limiting their own usage, and to students being anxious about handling the tablets in particular. There was a relationship between the teachers' confidence and their expectations that they must be respected in the classroom: 'If you don't know it, it may fail you' (Abdi, Primary, Incentive). On probing, this was linked mainly to either a lack of pre-service experience with technology, or to a perceived lack of training within the INS programme. Some felt that this was especially true for the incentive teachers who had grown up in Dadaab, but others, including the Kenyan national teachers, felt that they were all equally unfamiliar:

Mostly the teachers you know those who were learning here, the incentive teachers from the locality, you'll find out that whom of us that finished schools here most of us have not accessed ICT during our learning time so it becomes kind of hard if we have not learnt on our own to help our students use it.

(Gurhan, Secondary, Incentive)

Overall, there was a concern that the technology would not always work (and indeed, given the challenges noted with the tools in this section mean that is a well-founded

concern) and that this would lead to difficulties in both the confidence that students have in teachers – and the power relationships in the classroom – and to the ability to manage the class without disruption:

Sometimes, ICT can be a failure... if you don't prepare yourself before you go there it will have an impact on you, and the children will be booing you.

(Mohannad, Primary, Incentive)

Development and training needs

Training came up across all the respondents as a key request, as a lack of training was perceived as a major obstacle to the optimal use of the INS. When I probed as to what kind of training, the answers were almost unanimously 'how to teach in our normal classrooms using this particular technological set up'. As one respondent noted:

We need to know how to teach with the technology. Most of the teachers have good knowledge of their subjects. We need to know how to connect the tablets and projector and how to prepare notes. Not to know about big complicated technology, just to us the set up and the small technologies which are available.

(Abdi, Primary, Incentive)

This articulates the overall position of the teachers: that they were confident in their subject knowledge and their pedagogical approaches, and were not clear how the use of the INS classroom could fit into their existing daily practice. During this study I also reviewed the training materials that the teachers had been using and used the interviews and discussions to probe around training received previously and perceptions of training needs. I found prior training to be very focused on the tablets and the use of the Apps, which was not the teachers' most common request or perceived benefits of the INS classroom. This tension is considered in the recommendations for practice section on pp. 167-169.

Challenges with the tools within the INS: Internet connectivity

This was one of the aspects which was the most discussed, in both the interviews and in the field notes. In meetings, a number of respondents noted the challenges but also that they had repeatedly raised this with both UNHCR and the Vodafone Foundation and that nothing had been forthcoming to fix them. Notes from observing meetings about the INS programme in September 2015 note:

‘There are some outstanding grievances from [the teachers’] side and they were very clear that these have been raised repeatedly since the programme began and have not been addressed. This feeling of not being taken seriously, especially in technical areas, has added to their grievances’ (field notes, November 2015)

The internet was one of the most common challenges, with a broad range from schools which have never been connected to those where it is ‘shaky’. As of November 2015, there was no connectivity in seven – more than half – of the INS locations in Dadaab, and at least three of the locations had never been connected to the Internet (field notes, November 2015). Respondents also noted that the patchy connection leads to a waste of time in preparing lessons and the classroom, and an inability to properly prepare for the lessons they wish to teach:

The internet is a really big challenge... when it comes to putting the content in the tablets, it really consumes time [and] the problem is, because the internet is not there, I have to keep the tablets, maybe for a few days to get to download what I need. (Mohamed, Primary, Incentive)

The perception that failure to meet these expectations came through from a range of respondents, especially those in schools which had never had access to promised aspects of the INS programme:

I myself was a student in this school in 2014 and we were told even then that we would be able to access [Internet]. I became a teacher in 2015 and still it’s not there now. We believe maybe we will be without this thing. (Sami, Secondary, Incentive)

Another area which a large number of respondents noted as a challenge was the lack of power. This was also linked to issues with security which mean that hardware cannot be safely left to be charged elsewhere:

Some of the barriers we have are with power, where electricity has not been working since last term. Also if the tablets are to be charged we had to put them [in the INS classroom] and here there’s not much security for those things so either have to lock them in this room and not use it or we have to stay with them until they are charged .

(Hamdi, Primary, Incentive)

The need for additional tools

Discussions around the need for additional tools to either make the INS function properly or to facilitate easier use fell into two categories:

- Expressions of the desire for additional technological tools, mostly additional hardware of the same type in the INS programme;
- Additional tools needed to facilitate the use of the INS artefacts

Of these two, the first was one of the most consistent findings. Teachers from all the schools felt that the small number of tablets (n=25 in each school) was insufficient, especially given the large class sizes and a feeling that, for a school population of more than 2,000, as in the case of all of the primary schools involved, this could never be enough. There were also issues with organising the sharing of tablets, across the school and within the classroom. This included perceptions about the impact of the students' own cultural-historical context on their interaction with the tools:

One of the things is that the number of tablets. Students want to have one on their own, they don't want to share. Because of the experiences that they have in this camp, they struggle to share. That's one challenge - the insufficient tablets.

(Yakob, Secondary, Incentive)

The pace of life in Dadaab, and the challenges of being a refugee in a resource-starved environment, meant that some of the traditional methods, such as tool sharing and team working were seen as a major challenge.

Sharing tablets was seen as challenging for a number of other reasons, particularly concerns that when sharing tablets not all students will take part, and some may not be learning from the exercise. There was a shared perspective across most respondents that sharing tablets was negative, and led to students not learning properly or not having time to individually take part in each exercise. This is an interesting tension against the finding that there were positive results from the enforced group work explored above. This is likely to depend on the individual teachers' ability to manage a classroom, as the other side to teachers feeling able to work with a class with wide-ranging abilities using the tablets was teachers feeling that it introduced challenges of children being unoccupied and more likely to disrupt a class if they spent large periods of time unable to use the resources:

We need more tablets so that every child might have one. For example, when the teacher comes here to teach mathematics every child needs a tablet to use the calculator. Two learners cannot use one tablet at the same time. One cannot wait and just sit until the other finishes. (Liban, Primary, Incentive)

Instead of sharing tablets, teachers who felt unable to manage a full class with a small number of tablets divide the class and teach only half during any lesson in the INS Classroom where 'it will force a teacher maybe to use 30 learners then maybe another 30 learners another period' (Ali, Primary, Incentive). This was also raised during discussion around timetabling and the success of the INS classroom, as many schools felt it was not benefitting as many learners as they had anticipated:

'It is not a time-table problem... It is a logistics problem. You cannot have the class in this room with this number of tablets. So you serve the first 30 and the rest of the class will go elsewhere and have their turn another time.

(Mohannad, Primary, Incentive)

Teachers and hardware access

The number of tablets was also felt to be a constraint in teachers preparing classes in advance, as there are not enough to have allocated tablets which can be used for research, downloading content or lesson planning. Two-thirds of respondents requested additional hardware for the purpose of lesson planning and gathering materials, something which was noted to also be possible if there were different rules around the use of the hardware and in particular the refusal to allow incentive teachers to take them home to use in planning. Having hardware which was specifically for teachers was raised by a number of respondents. As well as a request for more tablets or for some to be allocated specifically to teachers, there was also a clear feeling that a laptop would be more appropriate as it would facilitate teacher use of technology for traditional administration, and to build skills such as typing.

Classroom infrastructure

The second element was the lack of tools and infrastructure needed to facilitate the INS. Much of this related to the room itself and to the school furniture:

The other challenge is in this room we need to have more chairs and tables so children can use the tablets. Right now we have to borrow desks from other

classes and move furniture around before we can use the INS classroom.

(Ayoob, Secondary, Incentive)

Some teachers described how they had to bring furniture to the classroom for each lesson: as there was none allocated to the INS classroom, they had to bring chairs and tables from their usual classroom, taking up time and energy and being disruptive. In addition, every school had at least one respondent who mentioned that the room allocated to be the INS Classroom was too small. This was partly related to the challenges of security and maintenance, such as fears that tablets would be knocked off tables and broken, but also the simple challenge of getting a lot of students into a small room. My observation in the schools was that the majority of classrooms were the same size, so the only option for a larger INS classroom would be to build a specialist room. There is also the possibility that addressing challenges of furniture and storage of the hardware would mitigate this as an issue, but it is unlikely to be resolved with the large student numbers overall.

Engaging the community

There was a feeling amongst the respondents that the school was at the heart of the community: that 'the community surrounds the school' (Abdi, Primary, Incentive), and that there needed to be a greater engagement between the two. Several references were made to engaging the community, including parents and community leaders, to both understand and benefit from the introduction of technology. Some initial challenges were noted, such as that, 'the community side had bad perceptions about this INS Project, when they have learnt about it they changed their mind about the bad perceptions they had' (Ayoob, Primary, Incentive). On probing, only the most general nature of this 'bad perception' was apparent, focusing on the possible negative media children could be subjected to when accessing the Internet.

There was a feeling that technology can be beneficial to other social structures such as parents and community groups. Only teachers from one school reported that the INS Classroom was used in this way, mostly citing challenges of security and a lack of staffing outside of school hours, but at least one school was supporting the wider community to use the equipment:

It's a very beneficial asset to the school and also to the community. For example when the board of management of the Parent Teacher Association meet, we give them the projector and the tablet to use, so now they understand there is ICT and they are experiencing digital. (Mohammed, Primary, Incentive)

The majority of respondents felt a responsibility towards the wider community, though this was especially true of the incentive teachers. As noted in the section on attendance above (p.128-9) there are INS classrooms in only a few schools across the camp, and incentive teachers in particular noted that this causes friction with other schools and parents because of the perception that some are benefitting more than others.

Research Question 4: Summary

Findings in this section broke down into two main areas.

- Tensions between refugee and Kenyan national teachers. The data around challenges to the perceived constraints or barriers to optimal use of the INS programme showed that the majority of Kenyan national teachers perceived that the main barriers were the culture and status of the refugee population. This was discussed in terms of things which created challenges for students in achieving at school: cultural practices such as early marriage which prevents older girls from taking part, or the economic need to keep children at home to work. It was also noted that refugees were 'traumatised' and therefore unable to concentrate or engage. On the other hand, Somali refugee teachers felt that barriers were the refusal of Kenyan national teachers, or the design of the programme, to engage with them and give them the opportunity to take part. Whilst this tension is apparent in the camp, and potentially could be expected given the history of the settlement, the impact of this on the operating of schools in general and the INS programme in particular cannot be underestimated.
- Tensions between the design of the INS Programme and the reality. The second key area was around the barriers created by a poorly designed and executed intervention. Teachers from four schools talked about the lack of hardware, educational content or internet connectivity, including one school where the planned technology had never worked properly. Internet was seen as a particular frustration – possibly because the donor was a well-known mobile network operator – because teachers already had an

understanding of the value of internet from their personal lives and use of communication tools such as mobile phones. Issues were raised around a lack of tools, the number and availability of resources, and whether teachers received adequate training to both feel confident in using them and in ensuring that students maximise their benefit. Finally, there was a sense amongst the refugee incentive teachers, that the programme design was also done without an understanding of the 'community' and the groups and individuals who should have been engaged.

5.8 **Research Question 5: What are the development needs for optimal impact of the programme: (i) At the level of the individual teacher (ii) For professional development activities and opportunities, and (iii) For modifications to the programme design?**

Increase curriculum-based content, and training to find and use other materials

Through the interviews, discussions and observations, there was a repeated request to access and share curriculum materials from the Kenyan authorities directly onto the hardware:

How can we actually [work on] curriculum integration? There should be content which is directly from the curriculum and which is given to us using this ICT. Then we can be trained on that.... What makes the teachers generally not like the INS Classroom is the content. But if there is content which is really from the curriculum and which is available, then it will be very simple for everyone.

(Mohamed, Secondary, Incentive)

This sentiment reflects a tension in two areas. One is around the challenge teachers face in following the rules in the camp, even where these rules may be opaque. In probing conversations, there was a feeling from teachers that the curriculum must be followed to the letter, rather than providing guidelines in which they can creatively develop their own teaching practice. This relates to the second tension between the teachers and the donors, whereby the expectations from the programme designers was that teachers would be able to use a range of resources, whilst the teachers felt that they should not be burdened to be searching for materials. My observation was that many teachers, both national and incentive, do not have the capacity or experience to creatively engage with finding and using materials in support of the curriculum and

expected to simply follow instructions in teacher reference guides. This is a huge challenge to realising the benefits of the INS.

There are rules which have been imposed through the introduction of the INS in the form of policies for the use and maintenance of the hardware. The interpretation of these and creation of rules at school level has been a point of tension, particularly where these relate to a sense of caution from school leadership in terms of securing the equipment. These rules are unwritten but formal, and are perceived as both hindering the optimal use of the INS Classroom and to showing a lack of trust in teachers. In particular they relate to the holding of keys by the Head Teacher or other perceived 'gatekeeper' and process to open the INS Classroom; and to the refusal of permission to teachers to take tablets home in order to prepare for lessons.

Refugee communities and a new identity

One of the undercurrents of the interviews was the identity of the incentive teachers and of the students, as noted in the discussion around Research Question 4. The majority of incentive teachers talked positively about Somalia, and felt that they were waiting to return home rather than being part of a diaspora community that was putting down roots. There was a strong feeling that they were linked to the community 'back home' and that education was a critical aspect of their journey in the camp:

Education is very important, and these people are refugees whom are not in their homelands... whatever knowledge they learn here will benefit them when they go back to their home countries to support their own lives and their communities. If they are educated then go back to their country Somalia, they'll support themselves and their country as well. That's why education is very important for the children in these refugee camps.

(Mohannad, Primary, Incentive)

Tensions between teacher communities in school

There were some tensions though within people's own identity as refugees. Whilst this was not teased out fully during the interviews, there was a sense that people are connected to multiple different communities, though they can feel very far away for people who haven't lived outside the camp: 'Most of them were born here, some were here for very long, like me personally I was here for 9- 10 years so they mostly feel part of

Kenya there is no much attachment to Somalia, but as community we are also aware of what's happening in that country' (Abdi, Primary, Incentive). There were also tensions between the incentive and Kenyan national teachers around perceived identities. Whilst this came out much more strongly during the pilot research, national teachers reported a suspicion that their incentive colleagues were teaching in Somali which was not appropriate for the curriculum.

Tensions between planned division of labour and reality

In the interviews and in discussions held during field visits, there were clear challenges with how this division of labour had been interpreted differently by different stakeholders, and the impact this had on the smooth running of the INS programme. All of the schools involved acknowledged that they had been unable to free the Coach from their other teaching duties, due to budget restraints and to a miscommunication between the donors and implementing partners who manage the schools around additional budget being made available. Schools felt unable to 'lose' a teacher, and partners were unable to make up the shortfall. This had not been apparent to stakeholders until some months had passed, by which time the tensions within the school were already clear. The status quo at all the schools involved, which did not change during the eighteen months of field work, was that the Coach tried to undertake his or her role as initially envisaged, whilst also maintaining full teacher responsibilities. This challenge was raised repeatedly during field visits as well as in interviews, where the management saw challenges in going outside of the rules which are applied stringently in the camp context, and which forbid extra financial incentives to teachers. As shown in vignette 4, this had a significant impact on the Coaches' motivation and on their opinion of how the programme was designed:

Vignette 4: Sami, incentive teacher, primary school

Tensions in the programme design of the Coach position and the lived reality

I have too much work, and this makes me resentful and unhappy. I am not incentivised for the extra work that I am expected to do. All us Coaches are pulled in two directions. We have our classes to teach and this additional work. Like me, I teach Class Four subjects but then I am needed in the INS to help a fellow teacher to set up the tablets. Tell me: what should happen as I'm only one person? I can soon be bored of this extra responsibility and I am already tired. We've asked the school administration to decrease the work load, either as a Coach or as a subject teacher, but they say that because of the budget they haven't recruited teachers and even more teachers are leaving. We have been told there would be two salaries for this Coach role as we work two jobs, but there is no extra money given to motivate us. Why should I work 21 hours as a teacher and 21 hours as a Coach and get paid the same as another teacher who just worked 21 hours in total? It makes me not want to do this role.

This is exacerbated by the long-term confusion over the role of the Coach. During interviews, it became apparent that many teachers understood that the Coach would be responsible for teaching everything that was to be done in the INS Classroom. This would mean that they would need to cover all subjects and grades across the school, and would stand in for the usual teachers, instead of that person teaching their class in the INS whilst being supported by the Coach. Even some of the Coaches have this perception, which led to increased resentment as to the scale of their work, as the Coach in one primary school noted:

I cannot make it from Nursery to Class 8. Even if I concentrate on that one only, without teaching my own class, it means I'm teaching all the subjects from Class 1 to Class 8.

(Vanessa, Primary, National)

This led to real confusion which did not dissipate during the months of research, highlighting a tension in perceptions between the activity system in school and that at donor level.

In addition to this, the wider school community were concerned that the focus of training and support going to one Coach meant that the other teachers missed out, and

that the INS was not sustainable or fair. There was also a challenge of perception that only Kenya national teachers had been selected as Coaches (which was not the case), and were then being given access to training which incentive teachers did not have. The five incentive respondents who noted this perception also reported a feeling that having an incentive Coach would give them greater access to support and opportunities to use the INS. Additionally, there was a concern that should something happen to the Coach – such as being absent through illness, but also noting that there was a high turnover of staff should that person leave – the school would be without support. All the participants talked about the Coach providing training to other teachers, and there was lots of warm appreciation of the work of the Coaches, but none of the other teachers interviewed felt that they could manage to use the INS Classroom without the presence and support of the Coach. This has implications for practice in terms of the planning and delivery of training within the school and the overall model of Coaches.

Research Question 5: Summary

The data pointed to two specific development needs. Firstly, ensuring that beneficiaries are involved with, and fully understand, the programme design. Secondly, recognising the tensions between that design and the reality and the impact this has on motivation and engagement. This includes around the planned management in school and the tension between rules and division of labour, including different teachers having very different understandings of what these plans were.

5.9 Chapter summary

This chapter has outlined the findings of the study, firstly through presenting the activity system under review and a description of the schools based on responses. Then the five research questions were considered, with findings broadly relating to the perceived benefits and challenges of the intervention. Benefits were reported as being improvements in teacher workload; perceived positive impact on student enrolment, attendance and behaviour; and a reduction in the isolation of refugee students. Challenges were largely based on design challenges within the intervention; lack of clarity on roles and responsibilities; lack of training and support; unfinished and inadequate technical elements; and challenges with the teaching materials.

Chapter 6: Discussion

The overarching research question was ‘what are the teacher perceptions of their engagement in the Instant Network Schools (INS) programme in Dadaab refugee camp?’ This chapter looks at this question through considering the findings in relation to the literature review, searching for dialectical relationships between the two. This section is organised around the subsidiary research questions, but in order to better consider the big picture of teacher perception these have been grouped:

- 6.1 presents some of the contradictions and tensions found within the activity system;
- 6.2 considers research questions 1, 2 and 3 which look into teacher perceptions of the benefits of the INS programme, impact on teacher motivation, and teachers’ perceptions of impact on students;
- 6.3 considers research questions 4 and 5, which explore the challenges in optimal usage of the INS and development needs in terms of personally, professionally, or changes to the programme design.

Recommendations stemming from these discussions are presented in Chapter 7, Conclusions.

6.1 System-wide tensions

The findings explored the tensions within and between the nodes. One of the strengths of activity theory is the focus on contradictions, so I also mapped the system-wide tensions to better explore these. Figure 8 (below, p.149) shows the contradictions between the nodes which came out of the findings:

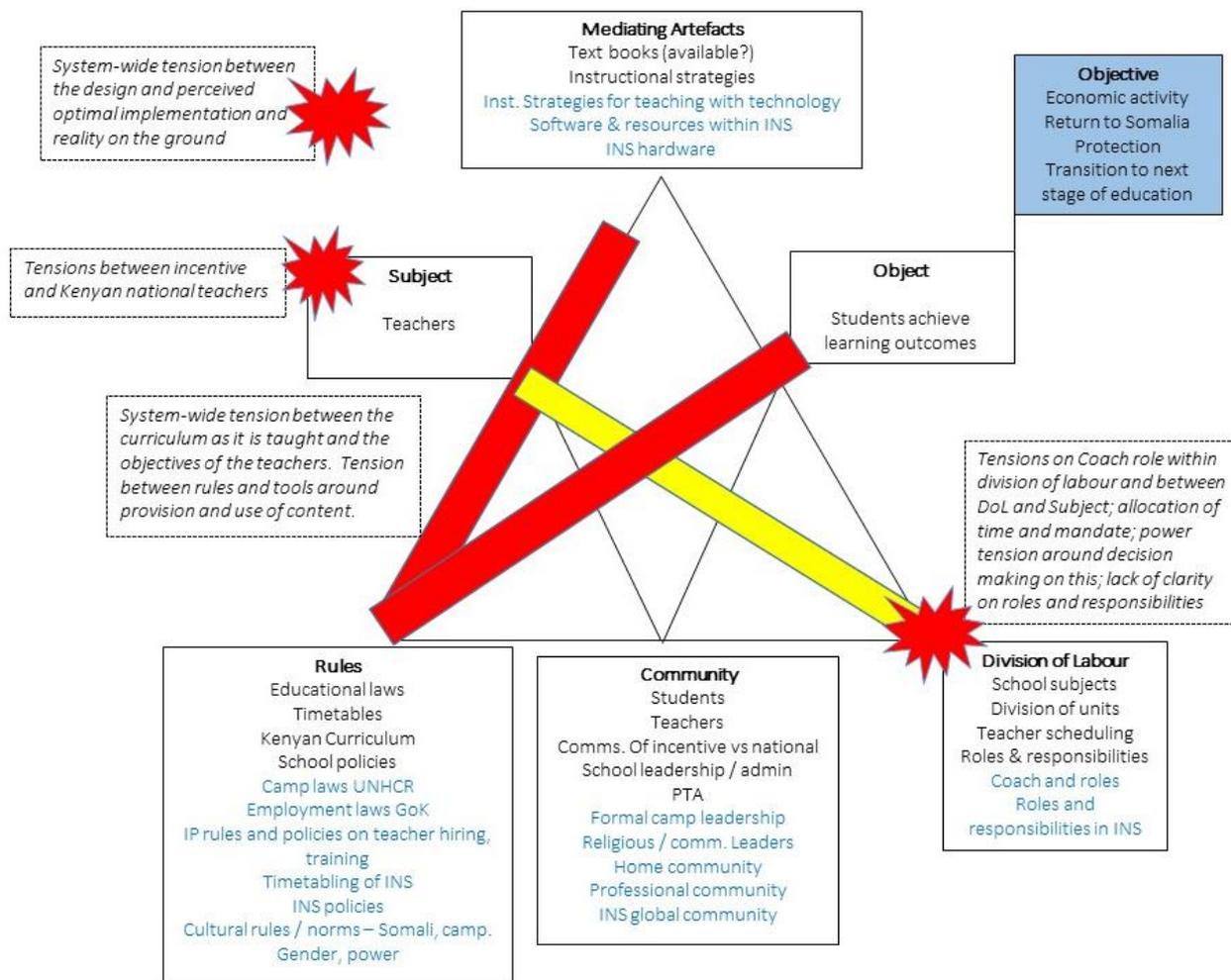


Figure 8: mapping tensions across the Activity Theory nodes in the Instant Network schools in

In Figure 8, the red lines show tensions or contradictions between different actors and perceptions within the activity system: for example, where the requirements of the rules of the camp structures contradict the tools and whether they are relevant. The yellow line shows tensions between the design or ideal version of the activity system, and the lived reality. ‘Concrete disturbances’ are shown by the red stars. Engeström et al. (2014) understand ‘concrete disturbances’ to be ‘potential critical events that may include seeds of emerging new processes and of which analysis may provide ... potential new understanding of activities’ (Engeström et al., 2014, p.142). One of the major areas for contradictions across the system is the difference between the design or planned version of an area, such as the role of Coach under the division of labour, and the respondents’ lived realities. Concrete disturbances are one of the key areas activity theorists focus on to try and identify key areas which can lead to transformation. In Figure 8 (above), concrete disturbances are found:

- Within the types of teachers involved and the interplay of structural power relationships;
- In the difference between the design of the INS and the reality of this in Dadaab, including where there are tensions between cultural epistemologies or approaches;
- System-wide tensions which are inherent to life in a refugee camp.

6.2 Research Questions 1, 2 and 3: teacher perceptions of the benefits of the INS programme; impact on teacher motivation; and perceptions of impact on students

My findings around teacher perception of benefits echo Ring and West's (2015, p.106) key themes from their meta-analysis of teacher motivation and retention in emergency settings, and I use these themes in this section to discuss the findings further:

1. **Teacher recruitment, selection, and deployment:** the impact of 'poor incentives and the lack of resources to deploy trained teachers contribute to low recruitment of qualified personnel' (UNHCR, 2012, p.46) was apparent in the limited capacity and challenge of retaining teachers. As well as the challenge in getting the right staff in place, this related to the tension between incentive and national teachers and the perception by Kenyan teachers that incentive teachers are not competent teachers.
2. **The teaching environment:** Both Kirkwood (2009) and Timperley (2008) argue that teacher practice is significantly framed by their environments: whilst only Timperley's (2008) study was in low and medium income country contexts, the two studies agreed. Findings around the impact of the INS programme on the teaching environment were mixed, with an overall feeling that whilst the introduction of new resources was beneficial, INS had not properly included additional support to the school environment, including basic elements such as adequate classroom furniture.
3. **Certification and professional development:** My findings here agreed with the literature from development and crisis contexts (Ring and West, 2015; Mendenhall et al., 2015; Kirk, 2009) which found an increase in teacher motivation through certification of training. In the INS programme, teachers were particularly frustrated with the ad hoc and on the job approach to training, which also seemed to have a limited impact. Additional literature (Kirk and Winthrop, 2007; Sinclair, 2002) found

challenges in training teachers, both because of a low baseline capacity, and with additional challenges in training refugee teachers in-situ. This was also noted in my findings, where design and provision of 'on the job' mentoring, either by Coaches to teachers or through workshops from INS staff, are based on the pragmatic needs to deliver training quickly. Though a series of trainings had been provided by the INS team, these were viewed as not being serious teacher professional development. It was challenging to pick this up from the interviews, perhaps because these usually included requests for additional training and so criticism was withheld for diplomatic reasons, but from field observations and meetings held with implementing partners, there were serious concerns. These findings agree with the literature that training, and the cultural perceptions of what constitutes appropriate training, is a key element of both successful programme design and of teacher take up.

The lack of relationships between the INS Programme and the overarching rule-making bodies meant that INS training was unable to offer proper certification. This was an additional hurdle to teachers valuing the training: even though the Vodafone Foundation did design and print certificates for participants these were not linked to wider structures or even linked into a modular qualification from INS itself. This reflects the literature, and that 'portable certification is a top priority for refugee teachers; however, the majority of refugee teachers are ineligible for admission to higher education institutions and require alternative qualification options (Gomez, 2013, p.3). For Kenyan national teachers, their training is linked into the Government teacher promotion scheme, and INS training was not able to develop a formal pathway into this. For incentive teachers, who had only received a limited amount of teacher professional development in any case, they are concerned with building up a strong portfolio of skills which can be recognised inside Dadaab and when they move. Kirk (2009) argues through a global series of case studies that the concept of certificates relates to the status of being unsettled as a refugee; of constantly having to be ready to move. For many, 'education certificates are valued more highly than almost any other possession' (Kirk, 2009, p.183). Whilst their study focuses on the accreditation of education for children, my findings show that certification of teacher training is equally important, and is a strong motivating factor for teachers to engage in professional development and feel valued as colleagues.

4. **Incentives** : Incentives, and particularly additional financial motivation, was mentioned frequently in INS meetings which I observed, though less so in the interviews. It particularly related to the Coaches, who felt that they had taken on significant additional work for which they were not recompensed. Sesnan et al. (2013) noted challenges for refugee teachers in that they are already inadequately paid, and therefore have to seek financial opportunities elsewhere. For this reason, failing to address Coaches' incentive needs is likely to lead to an inability to retain them, as they will instead choose to spend their free time in other employment. My findings show that this was a concern of Coaches, who also noted that they felt they were doing double work and were financially at a disadvantage as they were working for free outside of school hours when other teachers would take on additional work. Motivating Coaches is a key discussion around the design of the INS programme and is also considered in the conclusion chapter.

A related finding was the sense that teachers feel overwhelmed: Figure 8 (p.149) models how teacher commitment to the 'object' of students is contradicted by their lack of time and resources. The class sizes are often very large, and the amount of time allocated to teachers for preparation is limited, as are the available resources. There was a common report that teachers were overworked, and this is especially true of the Coaches who felt that they were doing double work for single pay. This echoes the international literature on the increase of teacher workload and demands on their time, leading to both work intensification and a sense that they have lost control (Galton and MacBeath, 2002; Gardner and Williamson, 2005; Williamson and Myhill, 2008). Reasons for this have been an increase in complexity and the range of tasks undertaken by teachers, including administrative and non-teaching workloads; increase in class sizes; and financial constraints on school systems. This intensification has led to the rejection or 'spotty' implementation of new initiatives, where 'teachers become more selective about what innovations they implement in their class' (Williamson and Myhill, 2008, p.29). This was reflected in the research into the INS Programme, where there was a clear lack of coherent implementation across the different schools. Whilst there is a tension between the permitted incentives found within the rules systems of UNHCR and implementing partners, addressing the workload of teachers and supporting the allocation of both

time and ways for teachers to retain their sense of control and engagement will be crucial to the future success of the programme. Whilst teacher salaries are set by UNHCR to ensure that there is equity across the camp, there may be options for non-monetary incentives. There is some mixed evidence on the efficacy of this but some studies in sub-Saharan Africa (Bennell and Akyeampong, 2007; Ariko and Othuon, 2012) found that the ability to offer improved access to other resources might improve teacher motivation and engagement. INS provides an opportunity to allow teachers freer access to the hardware, power and internet connectivity available as part of the intervention, and the possibilities of incentivising Coaches – and other teachers – should be more fully explored.

5. **Management structures:** These were explored in two main ways. Firstly around the challenges to the overall management structure of the programme and the Coaches' role in particular; and secondly relating to the management of the INS Classroom in each school. The former is further explored in pp.145-6, but the latter posed two main problems. The management structure of all the schools was not equal, and though policies were designed and shared by UNHCR and the INS team, these were not acted on in the same manner. Issues of security, for example, were often cited in the change to policies whereby the head-teacher acted as a gatekeeper to the equipment, meaning that teachers felt unable to complete their tasks in preparing for lessons. This was also perceived as a lack of trust in teachers, which was an additional demotivating factor. I observed that this seemed to build on the lack of trust that refugee populations had with the overall camp management and the host government (Human Rights Watch, 2016). There were other challenges in the overall management of the INS, and a disconnect between the Vodafone Foundation programme team and those teachers responsible for implementing on the ground. This is not surprising, due to the thick layers of UNHCR and implementing partner bureaucracy between these two, but the expectations and frustrations on both sides were clear.
6. **Status and social recognition:** There was a perception common to all the teachers that they were doing a good job in challenging circumstances. This was regardless of experience, number of years of teaching, or specific student engagement or results in their schools. There was a pride in being a teacher, at the heart of the community

and a strong and positive force in the lives of the students they work with in spite of the overall uncertainty of what these students might go on to do next. The finding that teachers had largely positive perceptions of the INS programme, regardless of whether the technology worked sufficiently to make the intervention functional, suggests that engagement in the programme had a symbolic value to teachers. Here, access to technology – whether actual or promised – can be considered as a status symbol which represents access to a new world outside of the low-resourced environment of the camp.

Perception of student motivation: tension between object and rules

My findings showed that the contested nature of life in the refugee camp creates tensions between incentive and national teachers. This is exacerbated by rules and systems: at a macro-level by global policy; at a meso-level by the host government and their education policies and restrictions on the refugee community; and at a micro-level between rules made at school level. This is echoed in the tensions between the rules and the objectives. Employment restrictions and the fact that students have approximately a 1% chance of transitioning to tertiary education which would require Kenyan certification (UNHCR, 2015a) mean that however motivated students and teachers are to succeed, there is a limit to what this success can mean. This also relates to the global challenge in refugee education around certification and the provision of meaningful assessments which students can use regardless of whether they are repatriated, or become citizens of either the host or a third country (Kirk, 2009). This in turn creates a contradiction between the subject-object dialectic, in which the teachers are focused on supporting students to create a future which is in fact denied to them by the political infrastructure. In my findings, teachers attributed their motivation to teach and their self-concept as a teacher to stem from their ability to support children in building new futures, along with the respect they receive from the community for this work. This is undermined by the limited opportunities available to students, and this tension seems unresolvable.

Teacher perception of benefits: Power and tensions within the system

A reflection of how respondents' considered their engagement and power within the INS programme showed that a sense of lacking agency is a key consideration. Agency is

understood here as the way actors 'critically shape their responses to problematic situations' (Biesta and Tedder, 2006, p.11). Agency also relates to political action, and to the critical space which is opened for the cultivation of agency, particularly intellectual. Psychologists working on cross-cultural issues have identified a 'conjoint model' of agency which focuses on the collective activity system and assumes that agency can be 'responsive to obligations and expectations of others, roles, and situations' (Markus and Kitayama, 2003, p.7). The agency of teachers, school administrators and parents to transform their activity system depends on their cultural-historical context. Somali culture tends towards conservatism and both the civil war itself and the forced migration to Kenya have had major impacts on behaviour and individual public presentation in Dadaab (Abdi, 2007). Conservative approaches can also be viewed as a response to crisis and shock, where individuals are not prepared to take risks or stand out: where conservatism is 'a response to vulnerability' (Kandiyoti, 1991, p.18). The findings showed that there was a lack of agency amongst the incentive teachers in particular, and a sense that they were unable to influence the design or management of the programme. In discussions around the challenge of the role of the Coach, or the missing or broken elements of the INS classroom, no respondents talked confidently about how they thought they would raise issues and have them met.

6.3: Research Questions 3 and 4; challenges in optimal usage of the INS and development needs in terms of personally, professionally, or changes to the programme design

Challenges to optimal use of the INS: comparing to lessons of good practice

New technologies alone do not lead to changes in teacher pedagogy or learning outcomes, or meaningfully contribute to change in any other aspect of education. There is a recognised continuum of technology adaptation, with users moving from substitutional to transformational to derivational adaptation (Lenz et al., 1998). Here, substitutional adaptation is the process of simply moving from one set of tools to another – from a physical text book to a digital one on a tablet, without any change in approach or usage. My findings showed that this was the level at which most teachers were considering the digital resources they had access to, though in the case of eBooks in

particular more teachers talked about viewing them positively rather than using them regularly. The next phase would potentially be substitutional approaches which are ‘instrumental, incremental and long term focused; they require substantial time and sustained investment’ (Westera, 2004, p.508) and would involve a strategic approach consistently applied across the activity. This would preserve the status quo of classroom teaching practice (Itzkan, 1994; Pelgrum, 2001). It seems that this transformation would only be possible with a level of strategy and engagement which is not currently found in the INS programme approach. It is especially a challenge to transforming education in a marginalised community like Dadaab, but my findings give the sense that there was not a coherent design based on a clear picture of what successful take up by teachers would look like, and much less a roadmap for how to achieve that. Because the intervention was trialled on a small scale in Dadaab, without being underpinned by the traditional infrastructure such as solid teacher capacity and professional development, the confidence of teachers to make transformational leaps – and the ability of the structures of education to facilitate or allow such transformation – is limited.

This also relates to the power structure within which education is sited and which perhaps refuses to concede sufficiently for transformation to be possible. An education system, using a traditional Kenyan curriculum with its own post-colonial underpinnings, managed by humanitarian organisations and ‘donated’ as part of an education in emergencies response is riddled with contradicting hierarchies, and may be immovable. This includes the use of the Kenyan curriculum. My findings echoed those of Mendenhall et al. (2015): that whilst teachers appreciated the use of the Kenyan curriculum, and in particular the focus on English, there were significant challenges in the relevance of the subject and materials. This was especially true of aspects of the curriculum which were unknown to teachers and students alike, and it is noteworthy that so many respondents talked about the successes of INS in terms of the way it had enabled them to ‘show’ subject areas that they themselves did not understand.

Uptake of technology

A key area for discussion and that has implications for practice is the support system put in place for teachers new to technology. Whilst the dynamic advances in

technology can be said to have bypassed the previous focus on ‘gardeners and gurus’ (Gantt and Nardi, 1992) where technologically minded team members could become proficient and help others to perform and learn, this is less true in contexts where there is less general exposure to ICT. Teachers’ own beliefs, their personal attitudes and life experiences have a central role in learning. This means that teachers’ own experiences of technology have an impact on how they are able to teach with it, as their own experiences of their subjects have an impact on their pedagogy (Zevenbergen et al., 2004).

Activity theorists have studied activity systems which include technology, but it remains a contested space. ‘[Digital technology] has become the basis of an emerging globalization process that is not only economic but cultural, not only universal but irreversible. There is nothing outside it. Reality itself has changed fundamentally’ (Rückriem in Sannino et al. 2009, p.88). Conversely, Daniels (2007) argues that ‘Technology and the media have transformed all aspects of human life—except education! here is the quest for the magic medium, the ultimate technology that will revolutionise education... there is no magic medium and never will be’ (2007, p.4).

As Cunningham and Allen note, ‘technology is never value free’ (2010, p.495), notably because the design process engages with human values, perceptions and activity systems at multiple levels. These two concepts relate to how teachers, especially those in contexts like Dadaab who are far removed from the socio-cultural context in which most technology they are using was designed, may select and adapt the interventions presented to them. The design process of the INS Programme was not based on engagement with teachers and communities in Dadaab, and was unable to respond to challenges when they did come up. A tension around the provision of content should have been relatively simple to overcome through agreement as to new content and provision of same, but this was not resolved during the two years of this study. Sharing content which is free and appears universally relevant, such as basic maths and science materials from the Khan Academy, was felt to be sufficient on behalf of the donors and implementing partners involved in the programme, and the lack of teacher uptake of this content was a source of frustration (field notes, March and November 2015). The frustration of not being taken seriously came through in the teacher interviews, where the feeling that basic requests – such as for internet

connectivity and power which had been promised and indeed formed the basis of the intervention – had been repeated by the teachers and Coaches for months without being acted on. Through this experience and within a context where they are already disempowered, it is not surprising that teachers felt unable to ensure optimal usage of the INS Classrooms in their schools.

Tensions across systems: divisions between types of teaching staff

Little of the literature considered the impact of the tensions between the host country and the refugee population in relation to relationships between teachers. Penson and Yonemura (2011) do explore this, but relate hostility between incentive and national teachers to the question of receiving teacher payments. My findings, however, showed that tensions between teaching staff are found, and impact on, a number of nodes, as shown in Figure 8 (p.149). This embodies the political dichotomy between the host nation and refugees. Teachers are never a homogenous group, but in the case of Dadaab where there are two clear lines drawn which divide people through nationality, citizenship status and paygrade, it is not surprising that there are significant tensions. Whilst the structure of these divisions is considered across the Discussion Chapter (pp.148-163), the respondents' self-perception was bound up in their position within that structure.

As shown above, it is crucial to understand the relational politics of the activity system to dive deeper into the finding that a tension exists. The majority of teachers are incentive staff who are assigned roles within the wider system of 'controlling' refugees, with strict limits on what jobs people can do and how much they can earn: something which impacts both teachers and the motivation and life chances of the students they teach. National teachers come to represent not only the enforcement of a seemingly irrelevant curriculum, but also bring in additional tensions as they are paid significantly more for doing the same job; may bring in their own prejudices towards Somalis and the camp; or may reflect the challenges of national government position and rhetoric.

The pilot study explored this in more depth as it only included Kenyan national teachers, but it found that a range of negative perceptions of incentive teachers sometimes made national staff unwilling – or uninterested – in training, supporting, or working with them. Interviews with the Kenyan Coaches also reflected the unequal

power structure between themselves and the incentive teachers, and their own position of superiority. Incentive teachers are not seen as 'teachers' as they are not qualified, and therefore cannot have the same 'calling' or vocation:

They don't have the passion for teaching, they are just there because there are not many other places they can go. The Head Teachers are also refugee teachers so they don't try and do anything about it. (Vanessa, Primary, National)

For Kenyan teachers working within the context of the 'other', this perception is unacknowledged and unspoken, but pervasive. This 'practical unconsciousness' (Lippuner and Werlen, 2009) is tacit knowledge or perception of the weaknesses of incentive teachers, which is reinforced by habits and socially constructed norms within the activity system, including the lack of focus on providing training and support.

Conversely, amongst incentive respondents there was a common perception that the INS programme focused on Kenyan national teachers, and that there was a lack of trust and interest in the Somali teachers being fully integrated into the programme. One respondent included a petition for the training of incentive teachers, where he believed that none of them had been trained. At least half of all the previous trainees were incentive teachers, as were more than 50% of the Coaches. But his perception clearly was that the programme was geared towards the nationals, and others reflected the same perception. This tension reflects the wider political tension between the host country's sovereignty, and the refugee population. There is nothing within the INS programme, or within any of the other work by implementing partners that I saw during this study, that explicitly addresses these perceptions and the challenges that they bring to successfully managing a school environment within which groups of teachers need to work in harmony.

These tensions prohibit the possibility of teachers and students from multiple backgrounds working together to construct a new 'community of the imagination – a desired community that offers possibilities for an enhanced range of identity options in the future' (Norton, 2010, p.355). This echoes Bernstein's position of education and social justice, that whilst 'education is central to the knowledge base of society, groups and individuals' (Bernstein, 1996, p.5), it is also a social service which is subject to institutionalised biases and a conduit for social injustice. He argues that pedagogic rights and democracy are inextricably linked, and that within schools, as within wider

democratic systems, people must have both 'a stake in society... and the confidence that the political arrangements they create will realize this stake' (ibid p.6). By identifying the tensions in the activity system, it is apparent that Somali teachers do not feel that they have this confidence. As one incentive teacher said,

I am a teacher who is not Kenyan of a Somali nationality I am here just for an asylum and when my country becomes peaceful I'll say thanks to Kenya you hosted me well and properly educated me then will just go back to my country.

(Sami, Primary, Incentive)

Development needs of the INS: Tensions between programme design and the experience of teachers and students

The Literature Review explored teacher professional development (pp.48-50) and how to motivate teachers to improve and to take up new initiatives. Within the design of the INS Programme the role of teacher development was uncertain, focusing on building up the capacity of Coaches with the assumption that these would trickle down to the rest of the teaching staff within the school. The findings show that there were concerns about the lack of training and support for teachers to be able to use the technology, and moreover that there were concerns about the quality of existing teachers.

Tensions within the programme design: understanding and engaging teacher agency

The findings consistently show that there is a disconnect between the lived reality of the experiences of teachers in the camp, and the design of the INS programme. Sigona (2015) argues that there is a need to understand the complexities of 'campzanship' which he proposes as a crucial articulation of understanding how refugees make sense of their own place and agency in the limbo of the camp setting. There are inherent tensions in the perception of refugees, especially those in camps, where seeing them as figures of victimhood is incompatible with a figure of a citizen (Fassin and Pandolfi, 2010) and where refugee camps can be viewed as a way of gathering and guarding 'undesirable populations' (Agier, 2011, p.8). This is a critical element in understanding teacher agency. Within these structures, the Instant Network School programme anticipated 'transformation' of teaching and learning, but did not go so far as to design it into the intervention. The expectation of teacher uptake and the adaptation of the

technology as many things – a library, classroom books, a tool box of new resources – was that it would happen organically. But this understanding of adaptation suggests that a more structured and coherent approach is required. Westera (2004) views this as a common model in taking a substitutional approach to educational technology:

A ‘no-model approach’ which is quite common in education: innovation is considered bottom-up and decentralised while relying on the enthusiasm and initiatives of educational staff members. (Ibid, 2004, p.508)

In many ways this is the opposite to the INS programme, which was very much a top-down intervention which was unable to get to the heart of the needs and interests of the refugee population. By introducing a programme which was designed in a high income, high infrastructure country without adequate infrastructure to bring the teaching population on board, challenges of the kind outlined in this study could have been anticipated. Recommendations for programme design are outlined in the conclusion chapter, pp.167-172.

6.4 Using activity theory to explore the activity system

In my research design and data analysis I aimed to consider the relational politics of teachers in the Dadaab camp. This links back to the literature on camps as contested places and on the design of education within that structure. Dryden-Peterson (2016) argues that refugee education is ‘inherently connected to the relationships between actors – students, teachers, families, UNHCR, national governments among others’ (Ibid, 2016, p.22). Fresia and von Känel (2015) in their work on the Nyarugusu camp in Tanzania (which is another site of INS Classrooms though it was established after their study) try to unpack the different power structures at play in the camp setting: from the host country government who decides on the right to remain and gives permissions around curriculum, assessment and teacher training and who are able to effectively halt all education activity, to UNHCR and implementing partners who fund, manage and employ teachers. Within this ‘polyhierarchy’ there are also differences in power between gender, nationality and ethnicity, and personal history. These relationships were echoed in my own findings.

Whilst the elements of the polyhierarchy were similar, in Dadaab these tensions are writ large. This may be because the tensions between the host country of Kenya and the home country of Somalia, as well as tensions for the Kenyans of Somali origin who make up the bulk of the national staff in the camp and straddle both sides. Part of the Literature Review (pp.46-48) explored the context of education in protracted refugee settings and other emergencies, and sets out the inherent tension between refugee camps and the nation state which hosts them. Researchers (Soguk, 1999; Agier, 2011) found that refugee camps are created both in and against the image of the nation state; refugees are characterised as a threat to 'nationhood' by existing without it, but also being managed by a host nation which can choose to apply legal and social systems or not. The position of schools in camps, both within the camp community and in relation to the macro-level politics which impact on camp life, is not neutral. As Fresia and von Känel (2015) note, by reflecting on the 'normal' daily life of a school, the opportunity is presented to explore a microcosm of these relationships and power structures. For my own research, there were three main areas where this was most evident: the tensions between national and incentive teachers; tensions around the use of the Kenyan curriculum and the perceived needs of the Somali teachers and students; and the contradiction between the objective for students' life chances and the confines of the camp regulations.

Activity theory and Development Work Theory

One of the criticisms of activity theory is that by focusing on the local and specific activity system, researchers miss the impact of overarching relational politics. In that section I explored R. Engström et al.'s (2014) Development Work Research and the attempted application of activity theory to the design of education interventions in Botswana. This is further explored on pp.67-68. Interestingly, many of their findings are similar to my own, though our conclusions are very different. They initially found similar challenges in the design of the programme, including lack of hardware and issues around planned sharing of devices; difficulty with infrastructure; and significant difficulty in embedding use of ICT within the existing curriculum. Specifically, our findings were the same in that the planned use of ICT was different to how teachers

eventually used the resources, even when the planning was in line with overarching policy:

...A local conceptualization of ICT as a school subject which led to highly compartmentalized understanding of new challenges and conflicted with [government approaches and] policy for use of ICTs in the local school context. This practice went hand in hand with, and was interpreted according to, textbook and test-oriented pedagogy.’ (R. Engeström et al., 2014, p. 140)

However, in drawing conclusions, R. Engeström et al. share a sense of disappointment that the local context which they had understood from a policy level had not been the same at a practice level. This means that their conclusions are skewed towards critiquing the local context rather than being able to fully interpret their findings within it. This is a concrete example of the critique of activity theorists’ ignorance of macro-level power structures and how these influence local activity systems – not in terms of policies but as they relate to social norms. Serpell (2014) critiqued this paper, saying that taking highly critical viewpoints on what are existing social norms is to misunderstand the context, and will lead to the design of projects which fail. I have aimed to avoid this potential limitation of activity theory, and have considered in this chapter some of the key political and macro-level tensions which were apparent in my findings.

6.5 Chapter Summary

This chapter has presented the discussion points from the findings in line with the literature review, with the aim of answering the overall research question around teacher perception of their engagement with the INS programme. Primarily, I explored tensions between the design of the programme and the lived reality of the teachers engaged in its implementation. Perceptions of the training and structures of the programme were explored, with particular focus on the role of the Coach, with some initial conclusions for the design of the programme which will be expanded in the following chapter. I presented a discussion about the system-wide tensions between the host nation and the refugee population and based on this outlined some considerations in activity theory in generating conclusions to this study.

Chapter 7: Conclusion

This chapter presents my key findings and outlines the original contribution made by this study, as well as the limits of these. I then make recommendations for policy, practice and future research, and end with a personal reflection.

Limitations

This study is limited in a number of ways (explored on pp.111-113). These are: the small number of respondents; the challenges in undertaking a longitudinal study or to interview teachers more than once; and the lack of robust secondary data with which to triangulate responses. There were also challenges with the quality of data because of language issues: whilst the respondents are all employed to teach in English medium schools, lack of confidence with the language means that the responses sometimes felt lacking in depth. In spite of these limitations, the focus on creating a descriptive case study means that the painting of rich picture of the teachers' experiences and perceptions can still be considered valid research.

7.1 Summary of findings

In considering the research questions, the main findings were as follows:

- 1. What do teachers perceive to be the benefits of their involvement in the programme on their teaching and learning?** Teachers perceived significant benefits of their involvement in the programme around a virtuous circle based on the positive impact on students; a feeling that they were respected and were being brought into the global world of technology; and that their schools were better than those without the programme. These benefits were still perceived, though, in classrooms where the technology had experienced significant problems, suggesting that there was a symbolic value of the technology which further research could better understand.
- 2. What do they perceive as the benefits to students?** Overall, teachers felt that lessons became more student-centred, and they were better able to support the weakest and challenge the most able. There was a perception that the programme had increased student enrolment, attendance and learning outcomes, though I was unable to triangulate this perception with secondary data.

3. **What do they perceive to be the constraints or barriers to their optimal use of the programme to support teaching and learning?** Power dynamics were insufficiently understood or addressed in the INS programme and this led to weaknesses in the intervention. This includes tensions between national and incentive teachers, which had direct impacts on the planned mentoring and peer-support. The macro-level tensions within refugee education which relate to the restrictions placed on employment and education opportunities mean that motivations behind teaching and learning are not well understood.
4. **What are the development needs for optimal impact of the programme? (i) At the level of the individual teacher (ii) For professional development activities and opportunities, and (iii) For modifications to the programme design?** A range of findings were around the development needs for the programme, including the need to better understand teachers' perceptions of the approaches to professional training; the need to refine the role of the Coach and ensure a joint understanding; and the need to better understand teachers' capacity around using content within their existing teaching abilities and understanding of curriculum requirements.

7.2 Contribution to knowledge

This study aimed to answer the research question, 'What are the teacher perceptions of their engagement in the Instant Network Schools programme in Dadaab refugee camp?' The primary contribution to knowledge is that this is the first research study focusing on this particular intervention. Whilst there is a recognition that much of the available literature on educational technology already focuses on observational studies of small-scale interventions (Power, 2014; Escueta et al., 2017) there is little research into how such interventions work in the context of a refugee camp. The secondary contribution is the use of activity theory in such contexts, particularly around education technology.

The literature review recognised lack of literature on teachers in protracted crises (Bennell, 2004; Mulkeen, 2010; Penson et al., 2011; Sesnan et al., 2013) and in particular the lack of literature on refugee teachers. In their meta-analysis, Ring and West (2015) argue that this lack of data means that programme interventions involving teachers suffer in the design phase, as programme planners and practitioners are not

engaging with well-understood needs. This was echoed by Sesnan (2013, p.11) who notes that '[T]he lack of literature on refugee teachers in developing... countries is a serious obstacle to understanding their needs.' By undertaking a study with refugee teachers which aimed to better understand their motivations, perceptions of interventions, and barriers to optimal use of new resources, I hope that I have contributed to the ability of the global community of practice to design better programmes.

7.3 Contribution to methodology

I believe that this research makes two contributions to Activity Theory. Firstly, there are critiques of Activity Theory as being insufficiently robust to be used by researchers working outside of their own context, or with activity systems which do not comprise linear activity systems. This study found that in-depth engagement with structural issues from the outset means that Activity Theory can be a valuable methodological tool in researching systems which include complex hierarchies of power, and provides an approach to act on criticism (such as Serpell, 2014) of the need to deeply engage with the macro-structures in which any activity system rests. Secondly, this application of Activity Theory outside its historical domain is a potentially valuable contribution to knowledge and methodological innovation, and the documentation of methodological tools and decisions I used contributes to the approach of Activity Theory.

7.4 Recommendations for policy

The introduction set out my aim to review the complex global policy framework which guides education in emergencies and protracted crises which is then related to a historical and meso-level review of where refugee education is situated. From this, there are some key recommendations for policy which echo the recent literature around refugee status. Dryden-Peterson (2016, p.473) showed 'how refugee children are caught between the global promise of universal human rights, the definition of citizenship rights within nation-states, and the realization of these sets of rights in everyday practices.' My research had the same finding and offers supporting evidence of what this means in 'everyday practices'. The challenges of macro-level policy were around two major aspects. Firstly is the use of Kenyan host country curriculum in spite

of the lack of recognition for this in Somalia where refugees are encouraged to repatriate to and the lack of motivation that this causes to both teachers and students. Secondly, the policies which restrict refugees' education and employment opportunities also have significant negative impacts on teacher recruitment and retention, and again on teacher and student motivation. Whilst changing global policy in a difficult political environment is a huge challenge, I support Dryden-Peterson (2016) in her call for these overarching policies to be reconsidered in order to better facilitate refugee children in realising their potential.

As part of the recommendations for practice comes a recommendation for a review of policy at the level of UNHCR and the wider stakeholder group of camp management including community leaders, schools and teachers. The challenges discussed in my study show how crucial the co-design and a full understanding of teacher capacities and needs are. At a policy level, there should be clearer frameworks for donors and other interested parties to use to ensure both high quality programmes and to manage the expectations and needs of teachers and other beneficiaries.

7.3 Recommendations for practice

This is largely based on the subsidiary research question, 'what are the development needs for optimal impact of the programme: (i) At the level of the individual teacher (ii) For professional development activities and opportunities, and (iii) For modifications to the programme design?' There are two major recommendations: refining the role of the Coach, and improving engagement of teachers.

The role of the Coach

There were significant challenges in the structure of the programme, and in particular the central role of the Coach. This may relate to a value tension between the activity system explored here, and the related system of programme design and management at the level of the international partnership behind the programme. The design assumed that there would be one Coach in each school, who would deliver training and provide on-the-job support to all the other teachers in that school. Successes and challenges of this are explored in the discussion of tensions between 'division of labour' and lived realities (pp.145-147), but there are particular difficulties in the different perception of the Coach

role amongst teachers, including those who are already Coaches themselves. There were specific power interactions between national and incentive teachers which also negatively impacted on the Coach role, particularly with the ability of Coaches to provide peer-support and training in a highly charged and mistrustful environment. Being able to recruit, retain and utilise Coaches in a positive way is central to this model of the INS working effectively. Recommendations are therefore:

- To revisit the options around Coach incentivisation and to evaluate options around either freeing up Coaches from their usual teaching workload or offering financial compensation;
- To create a tailored training programme which includes aspects of basic teacher training, and to integrate this with other, well respected teacher professional development programmes, including certification and assessment procedures;
- To clarify and improve on the communications between national and incentive teachers, ensuring that there is equity in the selection of Coaches, and that any in-school mentoring programme takes into account any tensions between teachers.

Engagement of teachers

Romiszowski (2004) argues that the only thing which can result in successfully developing and scaling innovations is the adoption of a holistic system-wide approach across all project phases including management, design and scale planning. Throughout the study, it was apparent that the programme had been designed without the engagement of the beneficiaries, or other key stakeholders. The sense that teachers were not taken seriously when they aired their grievances over, for example, the lack of internet connectivity, damaged their perception of the programme as a whole. A wide body of research was reviewed about teacher uptake of technology (Bromley and Apple, 1998; Postman, 1998; Brickner, 1995; Bakir, 2015, Polly et al., 2010; Ertmer et al., 2012). Central to these is gaining an understanding of teachers' own beliefs and practices. My findings show that a lack of understanding teachers' beliefs and practices has led to the creation of a weak intervention, whereby teachers' capacity, approaches to the curriculum, and classroom practice are not fully considered. Working with teachers as part of the programme design should focus on these areas. Specific recommendations include:

- To build up the understanding of teachers' needs and existing approaches in order to increase the engagement of teachers and communities in designing the programme moving forward. This relates particularly to training where my findings point to dissatisfaction with the type and methods of training, as well as the lack of impact those trainings have had to date on teacher competencies.
- To create mechanisms for programme monitoring and evaluation, including trouble shooting, and to build realistic expectations for schedules for this. This is important because the findings showed that many schools still lacked access to promised resources under this programme more than a year after the launch, and this was creating a lack of trust and engagement from teachers with the programme as a whole.
- Support to teachers to create their own educational content, and to fully understand and engage in how curriculum materials are developed, as well as building the critical thinking needed to select from existing digital tools. The selection of content requires a much more nuanced understanding of how teachers approach the curriculum and are able to use existing materials.

Recommendations for my own practice

Whilst I am no longer involved in the INS programme, I remain an education practitioner working with communities in protracted crises. The underlying message from the findings – both around the programme and from the use of activity theory – is the need to engage with, understand and acknowledge, the wider structural power issues. Finally, the research and reflection on my place as a European outsider working with vulnerable groups in very different contexts will continue to be at the centre of my work far into the future.

7.5 Recommendations for future research

Firstly, this study would have been much richer if it had been possible to triangulate teacher perceptions with education management data such as enrolment and learning outcomes. There is a window of opportunity in conducting such research in the future. Escueta et al. (2017) note that there is a dearth of studies on educational technology which evaluate impact on learning outcomes in particular, and this is a key area for further research. Without this, it is difficult to make recommendations for policy and

programmes which take into account the effectiveness of such interventions. Secondly, research across the Instant Network Schools in the four countries would create valuable insights into the factors which impact on the success of such an intervention. In addition to these, there are two areas of significance for future research: understanding teacher uptake of tools, and the use of activity theory in researching education technology.

Understanding uptake of tools

More detailed research around the design, support and use of tools by teachers would contribute to the knowledge base for both policy makers and practitioners. My discussion shows that where tools are designed and planned externally, with little in-depth knowledge of the teachers' daily activity systems and lived realities, the mediating space between the two causes tensions (see Figure 8, p.149). The discussion also showed that, compared to expectations from the literature, I found some major gaps in the anticipated responses. Firstly, none of the respondents talked about psychological tools. There was no mention, even with prompting, of maps, blueprints, best practice or other ways this could have been expressed. I probed the data for 'language; various systems for counting; mnemonic techniques; algebraic systems; works of art; writing; schemes, diagrams maps and mechanical drawings; all sorts of conventional signs' (Vygotsky, 1981, p.136-7) but there was little mention of these. Westera (2015) views all digital media tools as being part of these higher functions, being created by and contributing to human cognitive function. Through media, now including digital media, human beings can communicate knowledge across society and generations (Westera, 2015, p.21-22). Longitudinal research into how tools are used in the longer term and how these then become part of the activity system and the internal language of teachers, students and the wider community would be valuable in understanding how and when processes are internalised. In turn this would contribute to a fuller understanding of how to design tools and the structures around them.

Recognising the value of Activity Theory

I had aimed to confirm the usefulness of activity theory to address the needs of research studies into education and technology. The limitations of activity theory were explored in the literature review, including criticisms that its focus on specific activity

systems misses the implications of macro-level structures and context on individual practice. As a researcher using activity theory who has been able to engage with these structures, I believe that I have shown that this limitation is not inherent to activity theory and that by engaging with the broader context it is possible to draw meaningful conclusions. This is especially important in understanding the difference between the context on paper – at policy level for example – and the live reality of this in terms of social norms and practice. Within the refugee context, whilst the existing literature encourages a deeper understanding of the implications lived reality on practice, this study found Activity Theory was a useful way of engaging with complex hierarchies of power (for example where global and national policies which establish conflicting frameworks which do not fit easily with normative aspirations in the community). This allowed a richer analysis of respondents' stories, and my ability to understand the tensions within their lived realities. There is the potential for this to be considered as part of further research using activity theory as well as possibly around Development Work Theory, where activity theory has tried to link into practice. Creating methodologies and tools to fully explore power and structures for activity theory would be a valuable contribution to future researchers. In addition, the success of this study (within the recognised limitations) also suggests that activity theory is a valuable research tool in this area and future research into refugee contexts could usefully use Activity Theory.

7.6 Personal reflection

During the course of this study between 2013-2017, times changed. An initial literature review in 2013 found a dearth of literature on refugee education, whilst the revisions of the literature review in this paper included an additional eleven papers. The population of the Dadaab refugee camp changed too, with a reduction in inhabitants meaning a loss of the title of 'the world's biggest refugee camp'. But refugee numbers increased globally, reaching 65 million, or the highest number since the second world war. The international community apparatus is creaking and unable to cope with either the scale or the political challenges.

What did not change was the sense of urgency in finding solutions for children and teachers living in protracted refugee settings. New conversations need to be had, about the role of education for people whose livelihoods and futures are uncertain; about the type of education which can build resilience into communities whose lives are so heavily influenced by the politics of their home and host countries. Understanding and valuing the knowledge, aspirations and dreams of communities, and finding meaningful ways to bring these into education programme design is critical if solutions are to be found. Technology has the potential to play a role, but these macro-debates will create the framework in which ICT can powerfully provide resources and the chance to be part of new, virtual communities.

The commitment of teachers and parents to their children's education didn't change either. Teachers' perceptions of themselves were bound up in the achievements of their students – in their hope for a brighter future. They reflected on the changes and dynamics they had seen in their lifetime, from exile, to new interventions in schools, with an unwavering eye on their duty of care to students. The sense that learning gives both freedoms and protection, and can be both cherished as a gift and upheld as a basic right, should be central to the international communities' praxis in refugee education.

Annex 1: Letter of Informed Consent

Education Officers: giving permission for the teachers they manage to take part

Dear Education Officer,

As part of a small-scale investigation that is part of my study at University of Leicester (UK), I would like to find out (teacher's name) views on their involvement with the Instant Classroom Programme. This research was also outlined to you in person during the workshop in January 2014.

Any views expressed would be given in confidence, and any quotes used would be anonymised and used to help improve the project as well as contribute to my personal final thesis. I have approval from the Vodafone Foundation and from UNHCR, but this does not obligate you to give permission for your teachers to take part.

It is important to note that the teacher can withdraw from the research at any time.

If you are willing for (teacher's name) to take part in this research, I would be grateful if you could sign below. If you would like to ask any questions concerning this process, please feel free to contact me using the details below.

Yours faithfully

Rebecca Telford Mansour

E. rgtm1@le.ac.uk

T. +44 7967 015040

Education Officer's Signature:

Date:

Print name:

Teachers: giving permission for themselves to take part

Dear Teacher,

As part of a small-scale investigation that is part of my study at University of Leicester (UK), I would like to find out your views on your involvement with the Instant Classroom Programme. This research was also outlined to you in person during the workshop in January 2014.

Any views expressed would be given in confidence, and any quotes used would be anonymised and used to help improve the project as well as contribute to my personal final thesis. I have approval from the Education Officer who manages your school, but this does not obligate you to take part.

It is important to note that you can withdraw from the research at any time.

If you are willing to take part in this research, I would be grateful if you could sign below. If you would like to ask any questions concerning this process, please feel free to contact me using the details below.

Yours faithfully

Rebecca Telford Mansour

E. rgtm1@le.ac.uk

T. +44 7967 015040

Teacher's Signature:

Date:

Print name:

Annex 2: Documents used in document analysis

Internal Grey Literature	
Reports against Key Performance Indicators	January 2015 July 2015
Memorandum of Understanding	November 2015
Education Management Information System (EMIS) reports, compiled by UNICEF using the same metrics as national school reporting	January 2014 October 2014 March 2015 September 2015 May 2017
Lesson observation reports from INS staff	February 2015 October 2015
Exam Data: Kenya Certificate of Primary Education (KCPE) and Kenya Certificate of Secondary Education (KCSE) results for Dadaab	2013 2014 2015
Meeting notes from INS Programme Meetings with Coaches and implementing partners. I wrote these notes having organised the meetings.	17 th Dec 2014 11 th Feb 2015 30 th September 2015 6 th November 2015 22 nd January 2016 1 st April 2016
'Dadaab Stories': human interest stories from INS	Jan 2014 July 2014 Dec 2014

Annex 3: Digital content available in the INS Classroom

Name	Note	Available	Teacher Content	Student content	Offline on RACHEL?	Video	Audio/podcast	App	Online game	Online course	eBook
123 ABC handwriting fun	Touchscreen letter and number writing tool, and shapes	X		X				X			
Arabic Dictionary	Dictionary and translation tool	X		X				X			
Brain Pop	Interactive games, videos and quizzes	X		X		X	X	X	X		
CK-12	Text books for secondary school in English				X						
Duolingo	Language teaching tool for one language to English - used for quizzes and vocab testing	X		X				X			
eGranary	Internet-in-a-box, server and library of 32million resources available offline		X	X					X	X	X
Einstein Math Academy	Maths quizzes	X		X				X			
Electric Circuit	Tool for teaching electronics, building and testing electrical circuits	X		X				X			

GeoQuiz	Tool to teach geography and earth sciences	X		X				X			
Grapho Game	App for learning to read, self-directed game			X					X		
Hot Potatoes	Program for creating short quizzes and tests	X	X						X		
International Children's Digital Library	Online access to thousands of books in multiple languages			X						X	X
IRC Healing Classrooms	Videos and lesson plan resources for teachers working with children affected by conflict		X			X					
Khan Academy Lite	Videos and online resources for learning mapped to US curriculum. Mostly STEM subjects	X	X	X	X	X	X			X	X
KidsPaint	Painting tool, used mostly for young children	X		X				X			
Kindle	eReader app linked to content available on Amazon	X	X	X				X			X
Periodic Table	Interacitve periodic table	X		X				X			
Project Gutenberg	Free books in English, fiction and non-fiction				X						
Rachel Pi	Server giving access to a range of content, text	X	X	X	X	X	X	X			X

	books, Khan Academy videos and other agencies content										
Riptide GPS	Driving/riding game based on water physics	X		X				X			
Somali Dictionary	Dictionary and translation tool	X		X				X			
Swahili Translator	Dictionary and translation tool	X		X				X			
Ted	Access to Ted and TedX talks	X		X	X			X			
Virtual Lab	Virtual laboratory for science experiments	X		X				X			
Wild Animals	Tangram puzzles testing shapes	X		X				X			
World Atlas	Interactive world atlas	X		X				X			
World Reader	App giving access to books including some in local languages. Developing some games but mostly eBooks based on the curriculum	X	X	X				X			X

Annex 4: Publications and posts held during this research

Date	Publication or Presentation
July 2017	Presented at the University of Leicester's Summer School Researchers' conference on the topic 'Travels without visas: the perception of refugee teachers in Dadaab on technology-based intervention in schools'
June 2017	Quoted in an online article 'Education Technology Latest News & Updates: How EdTech Revolutionizes Education For Children Refugees' in <i>ParentHerald</i> , 22 nd June 2017
5 th January 2017	Submitted an abstract to the 2017 BERA conference which was shortlisted for the Early Career Researcher Award: 'Travels without visas: the perception of refugee teachers in Dadaab on technology-based intervention in schools'
January 2017	Blog article published on the Stanford Social Innovation Review website: 'The Messy Middle and Managing the Challenges of Scale-up. Five lessons on scaling educational technology for the most vulnerable children'
October 2016	Co-authored the following paper : Stubbé H, Badri A, Telford R, Oosterbeek, S. and van der Hulst A (2017) 'Formative Evaluation of a Mathematics Game for Children Outside of School in Sudan' in in Cai, Y., Goei, S. and Trooster, w. (Eds) <i>Simulation and Serious Games for Education</i> pp 61-18. Springer: Singapore
July 2016	Co-authored the following paper : Stubbé H, Badri A, Telford R, van der Hulst A and van Joolingen W, 'E-Learning Sudan: Formal Learning for Out-of-School Children' in <i>The Electronic Journal of e-Learning</i> Volume 14 Issue 2 2016:136-149
June 2016	Presented a paper on 'Innovating in Education' at the Cambridge University Centre for Arts, Research, Social Sciences and the Humanities (CRASSH) Technology for the Bottom Billion Workshop
	Interviewee/Co-author online article with Attila Mong: 'How technology can help education refugees' 26 th June 2016 <i>Deutsche Welle Akademie</i>
May 2016	Panel speaker: ICT for Education at the German BMZ ICT4Refugees Conference, Berlin
9-10 th March 2016	Speaker in a Symposium at Mobile Learning Week , UNESCO, Paris: 'Supporting quality education for young refugees and connecting schools through mobile technology'

May 2015	Speaker at the eLearning Africa Conference, Addis Ababa, Ethiopia on 'Serious games: education for children affected by conflict'
8-9 th October 2015	Co-author of a paper presented at 9 th European Conference on Games Based Learning (ECGBL) Norway. I did not present but the paper was published as: Stubbé, H., Badri, A., Telford, R. and der Hulst, A. (2015) 'e-Learning: formal learning for out of school children', in <i>The Proceedings of the 9th ECGBL</i> (pp 497-540)
September 2015	Paper accepted and presented at UKFIET: 'The role of pedagogy and continuous assessment in game-based learning'
July 2015	Designed and led the session ' <i>Designing for the Extreme: "How can we ensure an inclusive Community Learning Hub for the community of the Nyarugusu Refugee Camp"</i> ' at the Oxford Humanitarian Innovations Programme conference
June 2015	Telford (2015) 'How the world's top executives are preparing students in Dadaab for leadership' UNHCR Blog: October 29, 2015 http://www.unhcr.org/innovation/how-the-worlds-top-executives-are-preparing-students-in-dadaab-for-leadership/

Posts held during this research

Note that some were part time and therefore posts ran consecutively

Dates	Role	Organisation
September 2013- January 2015	Head of Innovations in Education	War Child Holland
September 2013- January 2014	Advisor: Peace-Building, Education and Advocacy Project	UNICEF (Global)
January 2014-April 2016	Education Co-ordinator	Vodafone Foundation
April 2016-August 2016	Lead for Education (Innovations Team)	UNICEF (Global)
Sept 2016-current	Education Advisor	UK Department for International Development (DFID)

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