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Research proposal

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**ABSTRACT**

The aim of this proposed research study is to explore the value of the educational programmes introduced into five after care centres in Grahamstown. Research data will be gathered from a range of stakeholders involved in these centres and programmes. The after care centres included in this study are participating in the Vestas Empowerment Trust programme. This programme was introduced in 2015. Aside from teacher development initiatives in local schools, it focuses on providing educational offerings, particularly in mathematics and literacy at five after care centres in Grahamstown.

I propose to begin with a macro level analysis aimed at understanding experiences across all five centres and across all educational offerings. I will then focus in at a micro level, looking at one centre and exploring the experiences of Intermediate Phase learners in this centre in relation to its after care mathematics club programme.

The South African Numeracy Chair Project (SANCP) at Rhodes University is one of the partners in the Vestas consortium, along with GADRA Education and other stakeholders, and is responsible for supporting the running of mathematics clubs in the centres. I am the Centre Manager of one of the centres participating in the Vestas programme. The Consortium has a two-pronged approach to addressing issues in primary schools: In School Time and Out of School Time. The intention of my research is to focus in on the latter, and, in so doing, to respond to the urgent need to find ways to address the critical underperformance of mathematical skills within the South African context, particularly in contexts of poverty.

My proposed methodology will involve a qualitative case study across the five after care centres (macro and meso level), with an embedded case study of Intermediate Phase learners participating in one mathematics programme at one centre (micro level). Data gathering methods will include documentary collation, and questionnaires and interviews with a range of stakeholders, including learners. At a macro level I propose to draw on two theoretical sources. Firstly I will draw on Bourdieu’s sociological theory of cultural and social reproduction, and in particular his notions of habitus, capital, field and symbolic violence (1972). Secondly, I may decide also to draw on Elder-Vass’s single emergentist theory of human action (2007). At the micro level, I will be looking at learners’ mathematical learning opportunities focusing in on one club. Here I propose to draw on a socio-constructivist perspective of learning, in particular Kilpatrick, Swafford, Findell’s (2001) conceptualisation of mathematical proficiency of which productive disposition is a key strand.

**INTRODUCTION**

This research is located within the field of mathematics education. Given, however, that the proposed focus is on after care spaces serving vulnerable learners from marginalised communities, I will be drawing also on literature in the field of social work. I hold a Masters degree in the latter field.

In 2014 a Consortium was formed between Gadra Education, The South African Numeracy Chair (SANC), Rhodes University, and the Lebone Centre. A joint funding proposal was successfully submitted to the Vestas Empowerment Trust[[1]](#footnote-1). Within the Consortium, one Centre formed partnerships with local NGO’s running after care programmes in Grahamstown. They are registered NGO’s who manage and raise funds themselves to run programmes or services as set out by their vision and mission statements. One of the agreed funding criteria for the after care centres was the introduction of educational programmes in the form of mathematics and literacy clubs for learners attending these centres. A requirement of the Vestas programme is the administration of baseline assessments at the beginning and end of the academic year to assess whether the implementation of the mathematics and literacy educational activities made a difference to learners’ numeracy and or literacy proficiencies. The empirical field of my proposed study at micro level will focus on one Centre’s Intermediate Phase learners’ numeracy capital and its possible evolution over time.

A colleague of mine (and now a Rhodes University Masters student), Ms Williams, is currently focussing on the learners’ reading behaviours and attitudes within the Intermediate Phase in the same centre. While such studies are critically important, the crisis in mathematics education as indicated in international regional and South Africa’s Annual National Assessment results (see Spaull, 2014; DBE, 2014) leads me to focus in on the possibilities of after school mathematics programs contributing to learner trajectories that might prevent learner mathematical performances from progressively worsening from Grade 1 to Grade 9 where only 3% of learners achieve over 50% (DBE, 2014). When comparing learners’ mathematics achievements to language, there is less of a decline in language results as one moves up the grades. Ms Williams’ and my proposed research would be complementary in their focus respectively on literacy and numeracy as both studies focus on the introduction of educational programmes with the Intermediate Phase learners. There are broadly four categories of Out of School Time (OST) learner offerings in the broader Grahamstown area. These are:

1. after care centres that are physically separate from schools and provide a secure environment for mostly vulnerable learners when they arrive after school (these centres will be asked to participate in this proposed research);
2. after care opportunities provided by schools where learners can stay at school after the official end of the school day;
3. holiday clubs or weekend camp programs that offer educational activities;
4. after school education clubs, such as soul buddy clubs or chess clubs etc. The maths clubs run by SANC are one such club involving learners staying either at school or receiving math club at an after care centre (Stott, 2015; Graven, 2016).

The proposed study is a response to the urgent need to find ways to address the critical underperformance of mathematical skills within the South African context. The aim is to explore the value of the introduction of educational programmes into five after care centres for children from marginalised communities within an OST context.

The majority of learners attending these after care programmes come from vulnerable home circumstances and marginalised communities: ‘vulnerable’ meaning that they come from backgrounds with at least one of the following: extreme poverty and or severe child neglect, alcohol and or drug abuse, domestic violence, extremely low literacy and or educational levels. According to the Organisation for Economic Cooperation and Development Review, close to 40% of children in the Eastern Cape sometimes or always go hungry (Bloch, 2009). These children arrive at the school gate in no position to learn (Bloch, 2009), not just due to hunger, but also due to profound socio-emotional burdens as described above (Bloch, 2009). The complexities of poverty and inequality and consequences thereof especially together with limited exposure to the kinds of language and literacy practices valued in schools, (Fleisch, 2008; Adler & Pillay, 2017) has an impact on scholastic achievement.

There is an enormous amount of literature indicating the current state of education in South Africa. While this literature serves to set a somewhat worrying scene, rather than focusing on a deficit discourse (Graven, 2014), the present study aims to explore a ‘discourse of possibilities’ in respect of opportunities afforded within after care spaces.

I propose to explore three different levels of qualitative data. At a macro level I propose to conduct a broad documentary analysis of after care centre national policy and literature relating to after care centres historically and currently across South Africa. This will enable me to understand the context within which the five after care centres in my study are operating. I will particularly analyse these documents for themes of care and education. At a meso level I will conduct a documentary analysis of the policies and guiding documents of the five after care centres in the study once again. Following this I will explore, across a range of stakeholders at these centres (including parents, learners, and facilitators), the stakeholders’ experiences of the introduction of the Vestas educational programmes. In respect to this macro and meso level of data collection I will draw broadly from Pierre Bourdieu’s sociological theory of cultural and social reproduction (Harker, Mahar & Wilkes, 1990; Robbins, 1991), and possibly, as change - via the maths clubs’ intervention - is implied, I will draw also on the emergentist perspective of Elder-Vass (2007). Elder-Vass’s work examines how causal powers interact in practice and how reflexive beings’ dispositions are modified (2007). At a micro level I propose to explore learners’ mathematical learning experiences in one maths club at one of the after care centres. Here I will draw on a socio constructivist perspective of learning, in particular Kilpatrick, et al’s., (2001) conceptualisation of mathematical proficiency, of which productive disposition is a key strand.

I have been in community development work for nearly 30 years and have been managing the Lebone Centre for six years and am acutely aware of the continued level of inequalities faced by the majority learners from marginalised communities. Through this research I seek to enhance my capacity to respond insightfully to possible future interventions geared towards addressing the educational needs of learners cared for at after care sites. I believe such interventions could become more effective if they are appropriately informed by theory and research (Dawes & Donald, 2005).

**CONTEXT OF THE STUDY**

Subsequent to the establishment in 2012 of Professors Venkat’s and Graven’s South African Numeracy Chairs, there has been considerable progress made in respect of primary mathematical knowledge (Adler, 2017). However Adler (2017) argues that primary mathematics remains an under-researched field in South Africa. My proposed research study would contribute towards further expanding this body of knowledge.

As noted in the introductory section, as a researcher I would prefer not to focus on the numerous challenges faced in the education field as they are widely publicised and documented. Focusing on education deficits can bring a sense of negativity and result in a “self-fulfilling prophecy” (Sfard & Prusak, 2005, p. 16). I want instead to contribute to “finding ways forward” as suggested by Graven (2014, p. 1049). At the same time, one must explore and confront these challenges in order to understand the problems and develop ways forward.

There is limited South African knowledge available on the practices, services, structured and or unstructured programmes that are provided at after care centres and the possible role/value they could offer for the educational needs of vulnerable South African learners cared for in after care centres. There is evidence concerning the value of such centres especially within the context of the United States where there is a history of over a hundred years of having run afterschool centres. These centres came about after changes in America’s child labour laws in the late 1800s which resulted in an increase in working class children being left at home without adult supervision (Scott, 2009). The aims of the American afterschool centres initially were to keep children off the street and to prevent them from becoming involved in illegal activity. This pastoral focus started shifting from providing a safe space to a more academically oriented focus, with the emphasis on quality programmes for low achieving students (Halpern, 1999). More recently, under the Clinton and Bush (junior’s) administrations, there was an increase in after school centre numbers, and in the development of a variety of programmes (Pfefferle, 2011). As it was government funded, evidence of impact was expected (Pfefferle, 2011), resulting in extensive, and ongoing research on America’s after school care programmes. These high quality studies were aimed at identifying effective components needed for such programmes (Rhea, 2013).

The Standard Operating Procedures (SOPs) in South Africa’s after school care centres in the Western Cape makes reference to improvements in academic, social and decision making results in children when they attend such centres (Allie, 2011). There appears however to be little reference to follow-up empirical research. While the value of after school care centres seems to be implicitly clear within these SOPs, the document makes specific reference to the urgent need of upscaling after school care programmes within the South African context. Bloch (2009) suggests the “drawing up of an Education Roadmap; exploring the range of non-school interventions, that could possibly have an impact on learners’ ” schooling (pp. 149-150). A further aim of my proposed study therefore is that it should directly contribute towards practical and theoretical knowledge within the after care field. Exploring the context of after care spaces where non-school programmes are being run, together with the addition of the current educational programmes, could shed some light on the influence of interventions on children’s schooling.

Proposed research sites

The proposed research sites are five after care centres in the Eastern Cape province of South Africa that care for predominantly Afrikaans and isi-Xhosa speaking learners from mostly Grade R-7. These are the dominant languages spoken in the area and the language of instruction (in the Foundation Phase) and of the schools they attend[[2]](#footnote-2). These learners are Black or Coloured learners from poor socio economic backgrounds.

The centres provide a secure environment for learners as well as a lunchtime meal. Many of the learners attending the centres are children from marginalised communities and mostly vulnerable as defined earlier. Due to these vulnerability and wellbeing issues, after care centres need to be registered as a Partial Care Facility with the Department of Social Development, and are regulated by the Children’s Act 38 of 2005.

The Western Cape’s SOP noted that:

Children are more vulnerable after school.

Unsupervised children are twice more likely to use drugs.

Children and youth in SA are 4 to 5 times more likely to be victimized than adults.

After school care helps prevent youth coming into conflict with the law. Most youth who break the law do so in the hours after school when they are unoccupied and unsupervised.

Orphaned children are more vulnerable and need extended support systems due to their vulnerability and with growing rates of HIV/AIDS and crime, the higher numbers of orphans will result in greater need for better community care services. (Allie, 2011, p. 7).

Prior to the Vestas programme each centre had autonomously decided on the content of their centre’s programme. This mostly included homework support and life skills. While these aspects continue, the inception of Vestas added an educational element in the form of literacy and maths clubs.

Within the Vestas intervention programme, literacy and maths clubs are run with learners in the Foundation and Intermediate Phases. The learners attend weekly maths and literacy clubs run by club facilitators employed at the centres. The maths clubs run weekly during South African Government School terms. Club sessions last for an hour within their respective groups. Club facilitators employed by the individual centres were and are trained in the running of the literacy and maths clubs (and are provided with ongoing support in the form of resources and face to face sessions). Dr Stott, employed at SANC, Rhodes University, trains the club facilitators on how to run a maths club with age appropriate games and activities. The aim of SANC’s maths clubs is to provide extra curricular opportunities for learners to talk about maths within a ‘safe and small’ environment where they are encouraged to develop, explore and make sense of maths. Graven (2011, p. 5) refers to maths clubs as holding “the potential for providing an enabling space” for developing new and more positive relationships with mathematics and more active forms of participation than is available in larger classrooms where teaching must focus on curriculum coverage and set departmental pacing .

Mathematical Field

As indicated earlier, numerous studies confirm that the crisis in education in South Africa “is exacerbated in mathematics” (Graven, 2014, p. 1041). Spaull (2014, p. 298) noted that “76% of grade 9 learners in 2011 still had not acquired a basic understanding about whole numbers, decimal operations or basic graphs.” Stott found within her research that Grade 3 learners’ understanding and comprehension of basic number sense and bonds were “severely limited” and they had to mostly depend on counting on their fingers or in ones to work out answers (2015, p. 133). These literacy and mathematical challenges are widely publicised (Fleisch, 2008; Bloch, 2009; Spaull, 2014; Butler, 2016).

Addressing this crisis in the early years of schooling is important. Kühne, O’Carroll, Comrie and Hickman (2013) clearly state that studies have indicated that “early mathematical skills (such as counting, number knowledge, estimation and measurement) are the strongest predictor of later overall academic achievement, more so than early reading and attention skills” (p. 4). Furthermore mathematics is frequently regarded as the “gatekeeper” of education in terms of its representation of “improved possibilities of academic and labour market access” (Mellin-Olsen (1987), as cited in Valero, 2005, p. 7). It is critical therefore to start exploring what numeracy identities and habitus vulnerable learners bring to school and after care spaces. In exploring aspects of the numeracy capital of intermediate phase learners at the selected after care centre, I hope my research will speak to the implications for practice that addresses mathematical inequalities in learning opportunities for learners from marginalised communities, thereby providing opportunities for vulnerable learners to develop more productive mathematical learning dispositions and trajectories. Such trajectories hopefully will open up improved opportunities for accessing the labour market and breaking the cycle of intergenerational poverty.

Mathematical learning trajectories

The aim of the SANC maths clubs is to support learners in the Foundation and Intermediate Phases in the development of mathematical proficiency (Stott, 2015). Kilpatrick, et al., (2001) clearly argue that to develop mathematical proficiency the following five intertwined mathematical strands need attention:

*conceptual understanding* - comprehension of mathematical concepts,

operations and relations

*procedural fluency* - skill in carrying out procedures flexibly, accurately,

efficiently and appropriately

*strategic competence* - ability to formulate, represent and solve

mathematical problems

*adaptive reasoning* - capacity for logical thought, reflection, explanation

and justification

*productive disposition* - habitual inclination to see mathematics as sensible,

useful, and worthwhile, coupled with a belief in diligence and one’s own

efficacy. (p.116)

Mathematical proficiency is developed over time and these five interwoven strands need to be developed alongside each other to allow for successful mathematical learning to take place. While all five strands of mathematical proficiency will be taken into consideration in the proposed study, the focus will be primarily on productive dispositions. The proposed study will place emphasis on exploring the numeracy capital (and included within this, the learning dispositions) of learners attending after care centres. Sfard and Prusak (2005, p. 16) refer to learner identities as “collections of stories about persons or, more specifically, as those narratives about individuals that are reifying, endorsable, and significant.” These narrative stories become meaningful to the storyteller and to researchers when presenting evidence of change. Sfard and Prusak’s (2005) operational definition of learner identities foregrounds that identities are socially constructed, collectively shaped by authors and recipients. In this sense negative numeracy identities can be shifted by changing the story that significant others narrate about learners which is an intention of the after school mathematics clubs (Graven, 2011). Whether (and if so how) the stories (told by learners themselves and by significant others such as club facilitators, teachers and parents) of learners mathematical proficiency and participation change over time will be explored in this study.

A common thread from previous research studies conducted indicates that where learners have a negative connotation towards their mathematical ability, this directly influenced their identity and therefore their participation in maths. Without intervention and ways forward, their stories are likely to remain unchanged (Graven, Hewana & Stott, 2013; Stott, 2015). After care centres potentially provide a space where learners can build on their numeracy identity by changing the content of their stories.

**RATIONALE, OBJECTIVES AND RESEARCH QUESTIONS**

As noted earlier, the research will focus in on macro-, meso-, and micro- aspects of after care programmes offering numeracy interventions.

Research questions:

1. In what way do the five after care centres policies and supporting documentation mirror or depart from national policies and practices for setting up and running after care centres? (meso analysis in relation to macro context analysis)
2. What are stakeholder perceptions and experiences of the mathematics education programmes introduced into selected after care centres for marginalised communities? (meso level)
3. In what ways does the implementation of an after care mathematics club programme appear to influence participating Intermediate Phase learners’ numeracy capital (micro level)?

**THEORETICAL FRAMEWORK**

As I indicated earlier, I propose to draw broadly on Bourdieu’s (1972 & 1991) sociological theory of cultural and social reproduction, whereby it is implied that patterns and the layers of advantage/disadvantage between different sectors of society as repeated from one generation to the next is reproduced.

Bourdieu’s framework will be used for the following reasons:

1. It is a framework that can be applied across the disciplines of education, psychology and sociological to social issues.
2. It lends itself to be a “springboard from which to open up new vistas” (Yang, 2014, p. 1522) within this exploratory study.

In particular I will use Bourdieu’s notions of habitus, capital, field and symbolic violence (Robbins, 1991; Dumais, 2002; Grenfell, 2007; Yang, 2014). As Webb et al. (2002) explain, Bourdieu’s notion of symbolic violence is where certain groups in society “are subjected to forms of violence (treated as inferior, denied resources, limited in their social mobility and aspirations), but they do not perceive it that way; rather, their situation seems to them to be ‘the natural order of things’ (p. 25). Bourdieu was a Marxist theorist. Marxian analyses of social class, point to a "false consciousness" (Engels, 1893/ 1968, unpaged) that is created whereby people are brainwashed into believing that every member of a particular society enjoys the same opportunities for success. Marxian theorists would argue that in reality though, there are processes at work (particularly in capitalist societies) to ensure that only the more powerful groups thrive and prosper. Subordinate groups remain oppressed and excluded from genuine opportunity. This, Marxian theorists say, represents symbolic violence. Within the predominantly Coloured community where the after care centre at which I work is situated I have noted intergenerational low literacy levels and intergenerational poverty that Bourdieu refers to. In this study I propose to look at a possible disruption[[3]](#footnote-3) of these patterns of social and cultural reproduction. After care centres are already explicitly attempting to disrupt the care level of vulnerable learners by providing a secure environment and nourishment for them in the afternoons. The introduction of literacy and numeracy educational programmes has added a second level of potential disruption of the cycle of educational underperformance.

Bourdieu’s notions of habitus, capital and symbolic violence developed against the backdrop of inequalities within the French social class system, are eminently transferrable within the South African context, with its history of apartheid, inequalities and poverty. Bourdieu defined habitus as a “collection of informal skills and knowledge which participants have constructed over time” (Jorgensen, Gates & Roper, 2014, p. 223). He argued that these have been actualised by class positions, rather than personal preferences. As Jorgensen, et al. (2014, p. 223) explain, learners therefore participate in an “activity such as learning mathematics, with a habitus that has already been shaped by their early socialisation within the family, home and immediate environment, and this shapes the way they act in and interpret their worlds” . In looking at learners’ mathematical learning opportunities in clubs, I indicated that I propose to draw on a socio constructivist perspective of learning, in particular Kilpatrick, et al’s., productive disposition (2002). I see a strong coherence between Kilpatrick’s notion of ‘disposition’ and Bourdieu’s notion of ‘habitus’ and connecting these theoretically, and in relation to the empirical data, will be part of the contribution of this study.

Social capital mostly means belonging to a group. Cultural capital includes a wide range of resources (for example, educational accomplishments, use of language, dress, and general cultural awareness) that can be invested in the social system. Some forms of cultural capital produce a better ‘return on investment’ than others. Exploring the habitus of the learners will help to shed light on the learners’ numeracy capital and on how, if at all, this habitus can be influenced or reshaped positively, in an attempt to break the cycle of underperformance of learners from marginalised communities.

Although the notion of ‘field’ was developed later in his life, it forms a “central pillar” of Bourdieu’s framework (Yang 2014, p. 1526). Bourdieu and Wacquant (as cited in Dumais, 2002, p. 46), stated that the field is “a network, or a configuration of objective relations between positions.” This is the space/field in which practices occur. Each field is a social arena within which struggles take place between dominant and subordinate groups to control resources or what’s valued within that space (Dumais, 2002). To augment Bourdieu’s notion of habitus I am considering drawing on Elder-Vass (2007) emergentist theory of human action[[4]](#footnote-4). I am considering this because of the possibility of change within learners’ habitus and numeracy capital through their participation in maths clubs activities.

**METHODOLOGY AND RESEARCH DESIGN**

Stebbins (2001) describes exploratory research as “messy, without direction, time consuming and fraught with possible disappointment, among many other unwanted qualities.”(p.vii). These are thoughts I have experienced, due to the cross-over of disciplines (social work, psychology, sociology, education) and the nature of exploring multiple aspects of the after care programmes, all within the context of limited previous research of this sort within a South African context. While this seems ‘normal’ within exploratory research, one has to try and sort through the ‘messiness’ to find direction. However, time consuming, that is the nature of exploring with the aim of possibly finding “new vistas” (Yang, 2014, p.1522). Stebbins (2001) describes the continued relevance of exploratory research as especially great when ‘the phenomenon under consideration is still poorly understood’ (p. viii). Understanding the benefits of education programs, in this case the possible benefits of participation in a mathematics club intervention programme, within after care centres is, as noted, currently under-researched and in need of further exploration.

An overarching case study approach will be used to capture and analyse the qualitative data at the macro and meso levels. An embedded case study approach will be used at the micro level to collect and analyse the qualitative data that I gather. A case study approach was chosen to enable rich thick descriptions of data. Cohen, Manion and Morrison (2007) identify the following trademarks of a case study:

It is concerned with a rich and vivid description of events relevant to the case.

It provides a chronological narrative of events relevant to the case.

It blends a description of events with the analysis of them

It focuses on individual actors or groups of actors, and seeks to understand perceptions of events.

It highlights specific events that are relevant to the case.

The researcher is integrally involved in the case.

An attempt is made to portray the richness of the case in writing up the report.

(p. 253)

The proposed case study, therefore, will explore and analyse data at three levels. At the macro level, the first step will be to collect data through a system review of national policy in relation to after care centres and then a review of the policies and supporting documentation of the care and educational offerings (if any) of all five after care centres involved in the Vestas programme. Thematically their founding documents, policies, vision, mission, objectives and their programmes within the broader South African post-apartheid context will be analysed to develop an understanding of the context of Out of School Time spaces both individually and collectively to assess the suitability of after care centres as spaces for the introduction of educational offerings. How these compare to the international body of literature available on policies and practices of after care centres will also be discussed.

At themeso level,individual semi-structured interviewswill be held at the five centres with the club facilitators, centre managers and with the Vestas co-ordinator. The purpose of the interviews will be to establish what they perceive the enablers and constraints of the maths club practices to be. Interviews will be held with the club facilitators to develop an understanding of the learner’s numeracy experiences. Club facilitators will then be asked to identify two learners (and their parents or guardians) from each site that might be willing to be interviewed. These various interviews should provide rich qualitative data on the experiences of stakeholders across the five after care centres’ attempts at disrupting the care and educational trajectories of their learners. The interview data will also assist with strengthening the validity of data through triangulation (Kayrooz & Trevitt, 2005). The data gathered from these interviews will thematically be analysed.

At themicro level*,* the focus will specifically be on Intermediate Phase learners’ mathematical learning trajectories at one mathematics club at one after care centre. I have chosen to research the Intermediate Phase learners at my own centre not only because this provides an opportunity sample in that I have the greatest access to the learners and others directly connected with these learners (such as parents, teachers, club facilitator) but also because I consider that ethically approaching learners and community members who have a positive and established relationship with me will be less threatening than researching with those I am less familiar with. Establishing trust is important in gathering rich authentic data and while there are some disadvantages to researching those one is close to I consider that the ethical advantages outweigh the challenges.

Consent will be sought regarding the possible participation of the nine Intermediate Phase learners currently attending the numeracy after care programme at my centre. I am fluent in Afrikaans and English, which will be advantageous when communicating with participants. I have over the past several years built a good relationship with the parents and learners at my centre, and also with the learners’ class teachers. An interpreter will be used for the learners from the other four sites, where isiXhosa predominates.

The three levels of data gathering are represented in Figure 1, below.

***Figure 1*: Proposed Data Collection Framework**

At the meso level, various stakeholders across the five centres will be interviewed in order to gather their experiences of the introduction of the mathematics clubs into the centres. This will include interviewing the manager and primary carer of the IP learners at the centre, the math club facilitator, two IP learners who attend clubs regularly and their respective parents or caregivers. The primary carer of the learners at the centre will be asked to suggest two Intermediate Phase learners and parents who they consider might be willing to participate in this study.

At the micro level, as noted above, nine Intermediate Phase (Grade 4 – 6) learners from the after care centre where I work will be selected to participate in this study. Semi structured interviews will be conducted with the participating learners’ class teachers. The focus will relate to their perceptions of learners mathematical dispositions within the school classroom setting. Class teachers will additionally be requested to complete, pre- and post- the intervention questionnaires about the learners’ possible changing mathematical proficiencies, learning dispositions and forms of participation over time. Similarly, participating learners within the one site will be asked to complete a learner disposition questionnaire at the beginning and end of the year (for this I will adapt Graven, et al.’s 2014 mathematics dispositional questionnaire).

Semi structured interviews will be held also with the selected learners’ parents/ guardians. These interviews will focus on the stakeholders’ perceptions and experiences (including the learners perceptions and experiences themselves) of the learner’s mathematical proficiencies and particularly learning dispositions at the start of the club participation and at the end of it towards the end of the academic year. Semi structured interviews will also be held with the learners’ club facilitator focussing on mathematical proficiency and particularly the strand of productive disposition within the Lebone Centre after school care centre. I will also request access to quantitative data from two other sources: the Vestas programme’s baseline assessments[[5]](#footnote-5), and data collected by the SANC maths club facilitators. The club facilitators, as part of the program gather pre and post assessments on learner mathematical proficiencies over the course of their participation in the mathematics clubs. Should all stakeholders be willing for me to access this data, which will be published in a report to funders, this will provide a valuable secondary source of rich information which could be interwoven into my study.

**VALIDITY AND RELIABILITY**

Due to the exploratory focus of my proposed research and the use of qualitative data collection tools it is important to ensure that I produce quality, trustworthy, and dependable data. This can be achieved by applying at least two of the following eight validation strategies suggested by Creswell (2013):

Prolonged engagement and persistent observation (#1)[[6]](#footnote-6); Triangulation (#2); Peer Review (#3); Negative Case analysis (#4); Clarifying researcher bias (#5); Member checking (#6); Rich, thick description (#7); External audits (#8).

In my study I plan to use several of these as expanded on below. Readers should be able to judge for themselves whether the research study demonstrated quality, trustworthiness, and dependability through the above identified strategies (Bennison, 2016). For this reason, as Kvale (1996) emphasises, validation should not just be performed at the end of the research but that it should be executed “throughout the stages of knowledge production” (p. 236).

In order to ensure that the system review at macro level is accurate, a governing body representative of each of the after care centres will be asked to check if the interview data was accurately represented (Maxwell, 1992). A critical national and international friend will be used to examine my overarching interpretation (Goodell, 2006) of Bourdieu’s theory of social and cultural reproduction and Elder-Vass’s emergentist’s theory of human action.

In exploring the overview of the experiences of the stakeholders at meso level, I am aware of the potential of being biased due to the position I hold at one of the centres. I am especially conscious of how power relationships could be a compromising factor. Clarifying and being reflexive about my different roles as researcher and as centre manager will be important in both these respects (#5). In the process of gathering my data I will constantly reflect on my position to ensure trustworthiness and quality of the data. To examine my themes and to ensure data is authentically presented I propose to present my analysis and findings will be presented in a ‘mini’ style conference to various people contributing to my data to check for any skewed interpretations of data (#3). Contributors will be assured that disagreeing with me will hold no consequences.

At a micro level I will use thick descriptions (#7) (after Geertz, 1973), plus attempt to include at least four of Denzin’s five primary typologies: biological, historical, situational, relational and interactional (Denzin (1989), as cited in Ponterotto, 2006, p. 545). The different methods used to collect data from learners, parents, class teachers and club facilitators (interviews and questionnaires) will facilitate triangulation (#2) as I will be able to check across these for possible corroborating evidence and disconnects (Creswell, 2013).

**ETHICAL CONSIDERATIONS AND POSITIONING OF THE RESEARCHER**

Informed consent as stipulated in the Rhodes University, Faculty of Education Guidelines for Ethical Research document, means participants have voluntarily agreed to participate in the research and most importantly understand what they are agreeing to. Due to the Vestas initiative, all participants have previously participated in one or more aspects of the educational intervention programmes. Ethically, therefore, no one participating in this proposed study would be excluded from the possible benefits of these intervention programmes and while they will be invited to participate in my research there would be no negative consequences in their choice not to participate. Informed consent will be obtained from the Governing bodies of the five after care centres regarding access to relevant documentation to enable the system review, as well as access to their staff i.e. club facilitators and staff management who will be invited to participate and if they agree will be asked for their signed informed consent to interview them (and have the interview transcribed). It will clearly be explained to staff that although their Governing body gave consent, they have the right to decline to participate in the proposed study with no consequences.

O’Carroll (2007) highlights an ethical issue particular to research undertaken in developing countries such as South Africa. This is that it can often be in a context where there is a “history of human rights abuse” (O’Carroll, 2007, p. 82). The goal of this research is ultimately a restitutive one in the sense that it hopes to contribute towards finding possible solutions of practices that can address past inequalities.

As researcher these guiding ethical principles will form the backbone of my research, and I will now explain briefly how I will be implementing these principles:

* respect and dignity,
* transparency and honesty,
* accountability and responsibility
* integrity and academic professionalism.

 Should any participants be unable to read and understand the consent form, it will be verbally explained to them. As I am aware of most of the literacy levels of the parents I will ensure that the content of the consent form is explained to them in their mother tongue. The form will be translated into Afrikaans and isiXhosa. An isiXhosa speaking person will be used to conduct the isiXhosa interviews and transcribe and translate the data. A translation check by a second translator will be conducted to support validity of the translation.

Although the proposed research study will not be conducted during school time with learners, informed consent will also be obtained from the three principals of the schools attended by the participating learners for permission to interview the class teachers. Informed consent will be gained from the class teachers and the request of their willingness to complete the Teacher checklist to explore learner dispositions and time for the semi-structured interview schedule that will be conducted pre and post intervention. Their time will also be requested for member checking and a mini style conference where feedback of the final data will be given to all of the participants in the research study.

I recognize that it is my duty to protect the welfare and anonymity of all those involved in this research. As the sample size of after school care centres and club facilitators is small, it is possible that participants could be identified. This aspect will require that data analysis, interpretation, and reporting will have to be conducted with great care and sensitivity. Issues of confidentiality will be addressed by giving participants codes that only the researcher will have access to. Data collected in the proposed study will be stored securely. All participants will be given pseudonyms to further provide anonymity and all data will be stored safely elsewhere.

There can be no hidden agendas involved when doing research and therefore it is important to be honest and transparent, including clarifying the various roles and relationships I have within this proposed study. As previously noted, in fulfilling these various roles there is a measure of power involved. I had developed healthy relationships with the partnership organisations prior to the forming of the consortium and continued this relationship after the consortium. The relationship is built on mutual respect for each other and all with a common purpose to find possible ways forward to bring about change. The issue of power will however be clearly discussed and clarified with the various stakeholders.

It is important that the Intermediate Phase learners see me first and foremost as fulfilling my roles as centre manager. I have built long positive relationships with the children, which was one of the reasons selecting the centre to conduct my empirical research at micro level.

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1. Vestas Southern Africa is a leading renewable energy provider and channels its Social Economic Development (SED) spend through the Vestas Empowerment Trust, hereafter referred to as Vestas programme. The Vestas strategy is focused on improving junior school education outcomes in the Grahamstown area. [↑](#footnote-ref-1)
2. Pseudonyms will be developed for the after care centres that form part of the Vestas programme. In addition, the Vestas program may be given a pseudonym. This will be discussed with the governing bodies and management of the various NGO’s, which will then be followed up with written consent. All five centres are proposed to be included in the systemic review, which will provide data to develop an understanding of the context of the various centres pre and post the introduction of educational programmes and whether these spaces could influence learners’ numeracy capital. [↑](#footnote-ref-2)
3. Disruption in this proposed study is referred to in a positive light; attempting to break the intergenerational cycle of poverty and low levels of literacy. [↑](#footnote-ref-3)
4. It was at my proposal presentation that it was suggested that Elder-Vass’s ideas would provide a further theoretical stance for my work. While I am not yet fully familiar with his work, I intend following up on this suggestion in more in depth once my actual study gets more fully underway. [↑](#footnote-ref-4)
5. These baseline assessments are requirements specified by Vestas. They are done at the beginning and end of each academic year during the initial three year funding cycle. While some of my proposed study’s participating learners would have been involved since the inception of Vesta’s baseline assessments, other learners will be new to the programme. [↑](#footnote-ref-5)
6. Layout idea obtained from Bennison (2016). [↑](#footnote-ref-6)