

**COMMUNITY INVOLVEMENT IN CHILDREN'S NUMERACY SKILLS
DEVELOPMENT IN MALAWI: A CASE OF NUMERACY BOOST
INTERVENTION IN TRADITIONAL AUTHORITY CHIKOWI, ZOMBA
RURAL**

M.Ed. IN POLICY, PLANNING AND LEADERSHIP THESIS

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UNIVERSITY OF MALAWI

CHANCELLOR COLLEGE

AUGUST, 2017

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By

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Thesis submitted to the Faculty of Education, in partial fulfillment of the requirements for
the degree of Master of Education in Policy, Planning and Leadership

**UNIVERSITY OF MALAWI
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AUGUST, 2017

DECLARATION

I, the undersigned hereby declare that this thesis is my own original work which has not been submitted to any other institution for similar purposes. Where other people's work has been used, acknowledgements have been made.

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CERTIFICATE OF APPROVAL

The undersigned certify that this thesis represents the student's own work and effort and has been submitted with our approval.

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DEDICATION

This document is dedicated with deepest appreciation and respect to my loving parents, brothers, sisters, wife, sons and daughters who supported me in a number of ways.

ACKNOWLEDGEMENTS

I am greatly thankful to a number of people for their diligent support and guidance throughout this work.

First, I would like to thank God for holding me strong throughout, without Him, nothing was possible. Second, my heartfelt thanks go to Dr Symon Chiziwa who energetically devoted his precious time to the supervision of this work. I found his suggestions valuable and criticisms constructive. Third, I gratefully acknowledge all the assistance given to me in this study by the teachers I worked with, the head teachers and PEAs for the schools and zones I visited during my study. Fourth, my sincere thanks go to the District Education Office for Zomba rural for allowing me to carry out the study in the 12 primary schools. Finally, I would like to thank my family for the hardship they had to go through in my busy schedule especially my little daughter, Mathulette Thauzeni.

ABSTRACT

This case study is about Numeracy Boost intervention which is being implemented in the 56 primary schools and 550 villages in T.A. Chikowi, Zomba rural. Numeracy Boost is an innovative numeracy intervention whose overall goal is to strengthen mathematics skills among teachers and learners in Standard 1 to 4 both in and out of school. The primary purpose of this study was to assess how communities get involved in the implementation of Numeracy Boost intervention in T.A. Chikowi. The overall approach of the study followed the qualitative research design and the following data collection methods were used: checklist, key informant interviews, focus group discussions, lesson observations and document reviews. The major findings of the study indicated that communities positively contribute to the success of this intervention in its impact area. In addition, the study revealed that there are a lot of challenges that inhibit the effective implementation of the initiative and these include high illiteracy levels among community members, inadequate teaching and learning resources and loss of the spirit of volunteerism by the community members. The study also noted that some communities have devised strategies of coping with the challenges like construction of permanent shelters for mathematics sessions and production of locally available resources for use in mathematics camps. This study recommends that the Ministry of Education and other relevant stakeholders should invest in community participation to realise quality education for all especially in numeracy education.

TABLE OF CONTENTS

ABSTRACT.....	vi
TABLE OF CONTENTS.....	vii
LIST OF TABLES.....	xi
LIST OF APPENDICES.....	xii
LIST OF ABBREVIATIONS AND ACRONYMS	xiii
CHAPTER 1	1
INTRODUCTION	1
1.0 Chapter overview	1
1.1 Background information	1
1.2 Statement of the problem.....	5
1.3 Purpose of the study.....	6
1.4 Research questions.....	7
1.4.1 Main question.....	7
1.4.2 Supporting questions	7
1.5 Significance of study	7
1.6 Operational definition of terms.....	8
1.7 Limitations of study	10
1.8 Chapter summary	10
CHAPTER 2	11
LITERATURE REVIEW	11
2.0 Chapter overview	11

2.1 Introduction to community participation	11
2.2 The conceptualisation of community participation	12
2.3 Community participation in educational governance and management	17
2.4 Community partnerships in mathematics achievement	21
2.5 Mathematics Attitudes and Achievement	23
2.6 Challenges to Parent Involvement in Mathematics	24
2.7 Theoretical Background.....	25
2.7.1 Parents and mathematical reform.....	26
2.7.2 Parental attitudes and beliefs.....	29
2.7.3 Parental involvement in mathematics projects.....	30
2.8 Chapter summary	32
CHAPTER 3	34
RESEARCH METHODOLOGY	34
3.0 Chapter overview	34
3.1 Research paradigm.....	34
3.2 Study area	35
3.3 Sampling	36
3.4 Data collection instruments	37
3.4.1 Checklist.....	38
3.4.2 Key informant interviews.....	38
3.4.3 Focus group discussions (FGDs).....	39
3.4.4 Mathematics camp lesson observation.....	40
3.4.5 Document reviews.....	41

3.5 Data analysis	41
3.6 Researcher's perspectives	42
3.7 Ethical consideration.....	42
3.8 Chapter summary	43
CHAPTER 4	44
PRESENTATION AND DISCUSSION OF FINDINGS.....	44
4.0 Chapter overview	44
4.1 Involvement of communities in the implementation of NB intervention	44
4.2 Factors that have enabled communities to get involved in NB activities	49
4.3 Challenges communities are facing as they implement NB activities.....	51
4.4 Sustainability plans for NB activities without external support	54
4.5 NB activities that are supportive of the teaching and learning in schools	58
4.5.1 Facilitator knowledge, attitude and practice	58
4.5.2 Children experiences	59
4.5.3 Material set up and space	60
4.6 Chapter summary	61
CHAPTER 5	62
CONCLUSIONS AND IMPLICATIONS.....	62
5.0 Chapter overview	62
5.1 Conclusion	62
5.2 Implications of the study.....	64
5.3 Areas for further study	64
5.4 Chapter summary	65

REFERENCES	66
APPENDICES	83

LIST OF TABLES

Table 1: A summary of responses on how communities get involved	44
Table 2: A summary of enabling factors for communities to get involved	49
Table 3: A summary of challenges faced by communities	52
Table 4: A summary of responses on sustainability plans for NB activities	55

LIST OF APPENDICES

Appendix 1: Interview guide for Ministry of Education official.....	83
Appendix 2: Interview guide for senior official from Save the Children country office .	85
Appendix 3: Interview guide for Zomba District Education official.....	87
Appendix 4: Interview guide for Save the Children official, Zomba office	89
Appendix 5: The PEA's or Head teacher's questionnaire	91
Appendix 6: Teachers' interview guide.....	93
Appendix 7: Camp Facilitator Checklist.....	94
Appendix 8: Mathematics Camp Observation and Evaluation Form	96
Appendix 9: Interview Guide for Parents and Traditional Leaders	98

LIST OF ABBREVIATIONS AND ACRONYMS

ACEM	:	Association of Christian Association of Malawi
BRIDGES	:	Linking home and school: A bridge to many faces of mathematics
CEECIS	:	Central and Eastern Europe and the Commonwealth of Independent States
DEM	:	District Education Manager
EFA	:	Education for All
FDG	:	Focus Group Discussions
MAPPS	:	Maths and Parent Partnerships in the Southwest
MoEST	:	Ministry of Education, Science and Technology
NB	:	Numeracy Boost
NCES	:	National Centre for Education Statistics
NCTM	:	National Council for Teachers of Mathematics
NESP	:	National Education Sector Plan
NSCPPSM	:	National Strategy for Community Participation in Primary School
OECD	:	Organisation for Economic Cooperation and Development
PEA	:	Primary Education Advisor
PISA	:	Program for International Student Assessment*Align
PTA	:	Parent – Teacher Associations
SACMEQ	:	Southern and Eastern African Consortium for Monitoring Educational Quality
SCI	:	Save the Children International
SMC	:	School Management Committee

TA	:	Traditional Authority
TEMA	:	Test of Early Mathematics Ability
TIMSS	:	Trends in International Mathematics and Science Studies
UNESCO	:	United Nations Education, Science and Cultural Organisation
UNICEF	:	United Nations Children's Fund
USAID	:	United States Agency for International Development

CHAPTER 1

INTRODUCTION

1.0 Chapter overview

This chapter presents the foundation of the whole thesis. It begins with the background information, statement of the problem, purpose of the study, significance of the study, limitation of the study and the operational definition of terms.

1.1 Background information

One of the goals of the Education For All (EFA) is to improve all aspects of the quality of education and ensure the excellence of all children so that recognized and measurable learning outcomes are achieved by all, especially in numeracy, literacy and essential life skills (UNESCO, 2000). Since this international commitment, there have been significant increases in primary school enrolments with the number of children out of school globally falling from 113 million to 70 million (UNESCO, 2008). Regardless of the substantial progress on access, the quality of education especially in mathematics in many Sub – Saharan African countries and beyond has gone down considerably. Many low-income countries are not faring well in mathematics (Mullis, Martin, Foy, & Arora, 2012). Recent reports from East Africa illustrate a profound lack of mathematical knowledge and skills in all grades (Uwezo at Twaweza, 2014). In Central and Eastern Europe and the Commonwealth of Independent States (CEECIS), mathematics performance is significantly poorer in countries with relatively lower incomes (UNICEF,

2007). Similarly, in Latin America, four of six countries participating in the Programme for International Student Assessment (PISA) rank in the bottom ten of all participating countries (Hanushek & Woessmann, 2012). Combined, these results indicate a far-reaching crisis in early grades mathematics achievement.

Malawi was among the first countries in Sub-Saharan Africa whose primary school enrolment for children increased by a 51% (World Bank – UNICEF, 2009) in Barnett, (2013). Despite significant progress on access and attendance, the quality of education in Malawi has gone down significantly. Malawi ranks second from bottom in the region for grade 6 mathematics, according to the Southern and East African Consortium Measuring Education Quality (SACMEQ) and 98% of pupils did not possess skills beyond basic numeracy (World Bank, 2010) in Barnett, (2013).

Policy makers, educators, and others involved in education are seeking ways to utilize limited resources efficiently and effectively and their efforts have contributed to realizing community participation as one of the strategies to improve educational access and quality (Uemura, 1999). In Malawi, a number of reforms are currently being undertaken, as evidenced by a revised primary curriculum and a new education strategy setting out an ambitious reform agenda. The overall framework for reform is provided by a 10-year National Education Sector Plan (NESP) (2008–2017). Central to the objective of improved governance and management is a focus on the need to mobilise communities for ‘whole-school development’ (MoEST, 2008:12) and to build on the 2004 National Strategy for Community Participation in Primary School Management (NSCPPSM). The

emphasis is on a move away from the use of communities as a means to mobilise resources towards deeper involvement in school decision-making, holding school management to account and following-up on children's learning (Barnett, 2013).

Existing international research calls for a more comprehensive understanding of community participation and its effects at the child, school and system level. However, Kendall (2007) notes that there is limited evidence available about complex measures of school processes or school-community interactions. This lack of information significantly constrains "evidence-based" arguments regarding parental and community role in quality improvement at the school and system levels. Some scholars of parent and community involvement in developing countries (e.g., Dunne et al., 2007) argue that there is limited research on how parent and community partners actually collaborate with schools to address issues of access, attendance, completion, and other local education problems, and with what effects. This, therefore, highlights the need for research on parental and community engagement in education, particularly on how to effectively involve parents in improving teaching and learning through SMCs and more directly through widespread engagement of parents and community members in student learning at home, in the community and at school (Afridi, Anderson & Mundy, 2014).

In Malawi, the 1962 Education Act states that every school should have a School Management Committee (SMC) to address a range of school issues and that the Ministry of Education recommends that every school should have a Parent Teacher Association (PTA) to mobilise communities and hold the SMC to account. However, the reality is that SMCs and PTAs often do not exist, or if they do, are largely dormant (MoEST, 2004). The NSCPPSM, (2004), notes that SMCs and PTAs are largely dormant, sometimes their

role is just predominantly one of organizing the maintenance of school infrastructure, meaning very little participation from communities in school management issues.

Parental interest and support in education, especially at home, has a major influence on pupils' educational outcomes and attitudes. Many parents, however, feel uninformed about current educational practices and how they can be more involved with their child's learning. A number of initiatives have been implemented internationally to encourage home-school links, but the documentation of these initiatives, particularly in the area of mathematics education, is limited (Muir, 2012). While there is widespread agreement in the literature that students' learning is maximised when strong educational partnerships between home and school exist (e.g., Groves, Mousley & Forgasz, 2006; Stephens & Steinle, 2005; Anthony & Walshaw, 2007), the nature of these partnerships, particularly in the area of mathematics education, is not extensively documented (Muir, 2012).

In Malawi, there is a shortage of literature concerning community participation particularly in mathematics education. According to the literature reviewed, there are a few documented cases in relation to the analysis of community participation in education in general (Barnett, 2013; Rose, 2003), quality in mathematics education (Kazima & Mussa, 2011; Johnson, Hayter & Broadfoot, 2000) and assessment of mathematical activities (Chimombo, Mwale & Ndalama, 2006). This review, however, failed to find documented cases of community participation in wide-scale mathematics interventions.

It is against this background the researcher assessed community involvement in the implementation of Numeracy Boost intervention by Save the Children International in the

56 primary schools and 550 villages of TA Chikowi in Zomba district. Numeracy Boost is an innovative numeracy intervention whose overall goal is to strengthen mathematics skills among teachers and learners in standard 1 to 4 both in and out of school in the following core domains; numbers and operations, geometry and measurement. Numeracy Boost uses a three-pronged approach: students are assessed to gauge how much mathematics they know, teachers are trained in mathematics content and pedagogy, and communities are shown how they can support mathematics learning in the home. Numeracy Boost is designed in conformity with the national primary school mathematics curriculum. Its uniqueness lies in the community action which facilitates interest and practice of mathematics skills in a flexible and non – threatening environment for those whose skills are not yet fully developed. In the community, parents and other relatives take the central role of implementing Numeracy Boost activities in mathematics camps and mathematics at home sessions. Mathematics camps are places in the communities where children meet in the afternoon to explore and play through mathematics games and activities to strengthen their mathematics understanding outside the school.

1.2 Statement of the problem

The primary education sub-sector in Malawi harbours most of the challenges in the entire education system due to increasing enrolment without adequate funding and management (NESP, 2008). Although access has greatly improved, Education Management Information System (EMIS) (2010 & 2011) data clearly demonstrates that there has been a negative impact on the quality of education in Malawi. For example, only 9% of learners master minimum standards in grade 6 English reading and only 2% master

minimum mathematics skills (EMIS, 2011). The low levels of numeracy and literacy in lower grades are carried over to the upper levels. It is evident from this pattern that the low numeracy and literacy skills negatively impact the teaching and learning and renders the entire education system ineffective. Various approaches used in teaching numeracy and literacy in the classroom have proved ineffective as shown by the test outcomes above. The root causes of low levels of numeracy and literacy skills among learners and the practices of various schools in teaching the two key areas in Malawi have not been explored in depth. Community support to education is limited to the contribution of labour in construction works through the SMCs and PTAs. Finally, according to the literature reviewed, there have not been any documented cases in Malawi where communities are directly involved in supporting the development of mathematics skills among their children.

1.3 Purpose of the study

The way policy makers and educators perceive community involvement may have a great effect in the way communities respond to calls for support in educational activities especially in the area of mathematics. The purpose of this study was to assess community involvement in the implementation of Numeracy Boost intervention in the primary schools and villages in TA Chikowi in Zomba district. This study was designed to explore community's perceptions of their involvement in the implementation of Numeracy Boost intervention. Specifically, the study sought to understand how communities get involved, factors that enabled them to be involved, challenges faced and any future plans to continue with the intervention should the external support cease.

1.4 Research questions

The research questions guiding the study were as follows:

1.4.1 Main question:

How are communities involved in the implementation of Numeracy Boost intervention in and outside primary schools in TA Chikowi in Zomba rural?

1.4.2 Supporting questions

1. What are the benefits that motivated communities to get involved in numeracy development of children in TA Chikowi?
2. Are there some challenges faced by communities as they get involved in the implementation of Numeracy Boost intervention in their localities?
3. What sustainability plans are put in place to enable communities continue with the implementation of Numeracy Boost without external support?
4. Are the activities in mathematics camps supportive of the teaching and learning that takes place in primary schools?

1.5 Significance of study

This study is hoped to assist policy developers and all other stakeholders in education sector to seriously empower communities to help promote the development of numeracy skills and come up with strategies that may enhance its implementation in schools and everyday life.

It is expected that teachers will wipe out the feeling that involving communities may make them lose authority within schools as power will be taken by the community and in the long run diminish their public regard for their professional status (Uemura, 1999).

It is anticipated to assist children have opportunities to practice refining mathematics skills in fun and useful ways with parents in a relaxed atmosphere thereby helping them develop confidence in themselves which is critical in being successful at school. This study is also intended to strengthen the link between the mathematics being taught at school and the mathematics in everyday life at home.

Finally, communities are expected to own the education of their children by: appreciating the overall objectives of education; matching what parents expect of education and what the school is seen as providing; erasing the belief that provision of education is essentially the task of the state (Uemura, 1999); erasing the beliefs that mathematics is difficult, dull and boring and based on the memorisation of rules and procedures (Muir, 2013).

1.6 Operational definition of terms

The meanings of the many terms commonly used in this study can be interpreted in different ways. The following definitions are provided to ensure clarity of meanings as used in this study:

- i) **Implementation** is the translation of ideas into action and involves devising and instituting an approach to help ensure that the innovations are put into practice efficiently and effectively (Ramsenger, 2004).
- ii) **Camp facilitators** refer to youths, parents or guardians who have volunteered to assist by teaching children in mathematics camps.
- iii) **Camp supervisors** refer to standard 1 to 4 teachers who have been tasked to oversee the operations at mathematics camps at school level. They act as the link between the school and the community to make sure that what is happening in camps is indeed supportive of the practices at school.
- iv) **Community** refers to the actors in a community that are defined by the organization active in the region of the research conducted. The community as can be seen here focuses on the school community and consists of the head teachers, the teachers, the local leaders, the parents and the children (ACEM, 2007).
- v) **Literacy** is the ability to read, view, write, design, speak and listen in a way that allows us to communicate effectively and to make sense of the world. Literacy allows us to make sense of a range of written, visual and spoken texts including books, newspapers, magazines, timetables, television and radio programs, signs, maps, conversations and instructions.
- vi) **Manipulatives** refer to teaching and learning resources that learners can interact with to aid understanding of concepts.
- vii) **Numeracy** is the ability to reason and apply simple mathematics effectively in order to meet the demands of life at home, in paid work, and or participation

in community and civic life. It consists of comprehending fundamental arithmetic, number sense, operational sense, computation, measurement, geometry, probability and statistics.

- viii) **Participation** is the involvement of a significant number of persons in situations or actions that enhance their wellbeing.

1.7 Limitations of study

There are many primary schools in Malawi but the study only used sampled schools from TA Chikowi in Zomba district. The use of the non-probability sampling to select the schools meant that the results would not be generalized to all primary schools in Malawi. However, the results are generalisable to the schools sampled and of similar characteristics and give an insight of what the picture could be like if more schools and other sampling methods were used. This study also used purposive sampling in order to include most of the respondents of concern. Some delays occurred due to unforeseeable circumstances in the process.

1.8 Chapter summary

This chapter has discussed the background information of the study focusing on justification, statement of the problem and purpose of study which includes research questions that guided the study. The chapter concludes by outlining the significance of the study to the education sector, operational definitions of terms and limitation of study.

CHAPTER 2

LITERATURE REVIEW

2.0 Chapter overview

This chapter presents a review of literature on community participation in education. It presents scholarly work and research findings on community participation by first giving an overview of what community participation entails in education and then exploring the conceptualisation of community participation. The chapter then proceeds by highlighting research findings on community participation in school governance and management, community partnerships in mathematics achievement, mathematics attitudes and achievement and challenges to parental involvement in mathematics. The last section of this chapter discusses the general considerations that guided this study by analysing the parents' and mathematical reforms, parents' beliefs and attitudes towards mathematics and finally findings of parental involvement in some interventions.

2.1 Introduction to community participation

Education takes place not only in schools but also within families, communities, and society. Despite the various degrees of responsibilities taken by each group, none can be the sole agent to take full responsibility for educating children. Parents and families cannot be the only group of people for children's education as long as their children interact with and learn from the world outside their families. Communities and society must support parents and families in the upbringing, socialising, and educating of their

children. Schools are institutions that can prepare children to contribute to the betterment of the society in which they operate, by equipping them with skills important in society. Schools cannot and should not operate as separate entities within society. Since each group plays a different role in contributing to children's education, there must be efforts to make a bridge between them in order to maximize the contributions. Education takes place most efficiently and effectively when these different groups of people collaborate. Accordingly, it is important to establish and continuously attempt to develop partnerships between schools, parents, and communities (Uemura, 1999).

2.2 The conceptualisation of community participation

The idea to use community participation in order to increase access and equity to quality basic education through creation of learner friendly schools is not new. Community participation has received increased attention in international and national policy in recent years (Rose, 2003a). The contemporary thinking about community participation is influenced by the participatory paradigm, which rests on devolution of decision-making power. The shift towards community approaches is also facilitated by the failure of externally driven projects, the lack of project sustainability and resource constraints (Jimu, 2008). To conceptualise 'community participation', a definition of community and of participation is necessary. Participation can be defined in amounts which can differ, just as the nature of participation can. Community participation can therefore be seen on a scale, with an extreme at both ends (Bray, 2000). Two extremes of participation are on the one hand 'genuine' participation, implying the ability to take part in real decision-making and governance. All members have equal power to determine the outcome of

decisions and share in a joint activity. This form of participation is voluntary and spontaneous. On the other hand, 'pseudo-participation' is, at best, a consultative process whereby citizens are merely kept informed of developments at the school level, and are expected to accept decisions that have already been made. Pseudo-participation is extractive, often limited to contributing resources for school construction and maintenance. To be truly participatory, community members should themselves choose their roles, and would need the appropriate skills to carry out their functions effectively (Rose, 2003b).

A similar classification of community participation can be made with the distinction planner-centred and people-centred. In this classification planner-centred stands for the type of participation that focuses on administrative and financial efficiency. This type of participation facilitates local acceptance of new policies and technologies promoted by outsiders (Mfum-Mensah, 2004). Therefore it can be compared with the concept pseudo-participation described above. In a people-centred approach, participation becomes a means to meet locally felt needs and redistribute scarce resources. It also possesses the inherent value as a process empowering the poor through enhancing local management capacity, increasing confidence in indigenous potentialities and raising collective consciousness (Mfum-Mensah, 2004). Epstein (1995, 1997) seeks ways to help children succeed in school and later life, and focuses on partnerships of schools, families, and communities that attempt to: improve school programs and school climate; provide family services and support; increase parents' skills and leadership; connect families with others in the school and in the community; and help teachers with their work. She

summarizes various types of involvement to explain how schools, families, and communities can work productively together: Parenting – to help all families to establish home environments that support children’s learning at schools; communicating – to design effective forms of school-to-home and home-to-school communication that enable parents to learn about school programs and their children’s progress in schools as well as teachers to learn about how children do at home; volunteering – to recruit and organize parent help and support; learning at home – to provide information and ideas to families about how to help students at home with home-work and other curriculum-related activities, decisions, and planning; decision making – to include families in school decisions, to have parent leaders and representatives in school meetings and collaborating with the community – to identify and integrate resources as well as services from the community in order to strengthen school programs, family practices, and student learning. That typology provides schools with a structure to help organize specific activities to involve parents in their children's education. Because there are many possible activities for each type of involvement, schools must choose which partnership practices are likely to produce specific goals and how to implement the selected activities effectively. For each type of involvement and practice, there also are challenges that schools must meet to reach all families, not just those who are easiest to involve (Epstein et al., 2002). For example, schools may be faced with the challenge of making sure that parents who cannot read or understand English have access to the information in languages or forms they can understand. Also, schools may be faced with the challenge of providing ways for all parents to contact and communicate with teachers and administrators so that information about students flows in two directions, from school to

home and from home to school. The success of a school's partnership program to affect student achievement may depend on the degree to which the activities that are implemented meet serious challenges to involve families who are the most difficult to reach. In designing programs of home-school-community partnerships, schools cannot assume that one type of involvement or a single activity will affect student achievement positively in all subjects. Studies indicate that each type of involvement activity leads to some different results (Epstein, 1995). If researchers produce better information about the results of specific involvement activities, more educators should be able to select and implement the activities most likely to produce the goals that they have set for their students. Many similar formats for conceptualising community participation have been made over the years (Dekker, 2010).

The concept 'community' is also widely discussed in scientific literature (Dill, 2009; Prew, 2009 & Rose, 2003b). However, a clear definition cannot be made, given the diverse nature of communities over the world. Most literature on development policy uses the term community without much qualification to denote a culturally and politically homogeneous social system or one that at least implicitly is internally cohesive and more or less harmonious (Manusri & Rao, 2004). The concept community implies a network of shared interests and concerns. The actors are however not necessarily a homogenous group of people with a common voice and a shared set of views (Ansell, 2005; Rose, 2003b). Communities can also be defined by characteristics that the members share, such as culture, language, tradition, law, geography, class, and race. As Shaeffer (1992) argues, some communities are homogeneous while others are heterogeneous; and some

united while others conflictive. Some communities are governed and managed by leaders chosen democratically who act relatively autonomously from other levels of government, and some are governed by leaders imposed from above and represent central authorities.

Bray (1996) presents three different types of communities, applied in his study on community financing of education. The first one is geographic community, which is defined according to its members' place of residence, such as a village or district. The second type is ethnic, racial, and religious communities, in which membership is based on ethnic, racial, or religious identification, and commonly cuts across membership based on geographic location. The third one is communities based on shared family or educational concerns, which include parents associations and similar bodies that are based on families' shared concern for the welfare of students.

The term "participation" can be interpreted in various ways, depending on the context. Shaeffer (1994) clarifies different degrees or levels of participation, and provides seven possible definitions of the term, including: involvement through the mere use of a service (such as enrolling children in school or using a primary health care facility); involvement through the contribution (or extraction) of money, materials, and labor; involvement through 'attendance' (e.g. at parents' meetings at school), implying passive acceptance of decisions made by others; involvement through consultation on a particular issue; participation in the delivery of a service, often as a partner with other actors; participation as implementers of delegated powers and participation in real decision making at every stage, including identification of problems, the study of feasibility, planning,

implementation, and evaluation. Shaeffer stresses that the first four definitions use the word ‘involvement’ and connote largely passive collaboration, whereas the last three items use the word ‘participation’ instead, implying a much more active role.

Participation allows community members as principal stakeholders to influence their own development. Community development is supposed to reflect people’s actions and attributes of self-consciousness. Hence, commitment to community development should recognize interconnectedness between individuals and the societies to which they belong (Jimu, 2008).

2.3 Community participation in educational governance and management

The existing literature identifies parents and community members as key stakeholders in school management programs and decentralisation measures in education. It is strongly argued that parental and community involvement is key to ensure access and quality education provision. In the Dakar Framework for Action, a document that reaffirms the goal of ‘Education for All’, governments pledge to develop responsive, participatory and accountable systems of educational governance and management. The devolution of authority to schools and local communities is seen by many as a means to this end. Moves towards greater school autonomy are often accompanied by the creation of formal structures, such as school committees, village education committees and parent-teacher associations, to facilitate parental and community involvement in school management (EFA, 2008). While schools may officially have formal structures designed to facilitate community and parental involvement, there is often a large gap between intent and

outcome. Even when parents nominally participate in school management, they may have a limited say. In some contexts ‘participation’ is confined to raising money, with limited influence over how it is used. Participation is viewed by many as a goal in its own right, but for most parents the ultimate aim of any involvement in school management is to improve children’s education (EFA, 2008). Formal participation and consultative arrangements may not facilitate achievement of this goal. Participants may have limited knowledge about issues under discussion, such as school performance and teaching practices. Parents may lack the expertise or confidence to appraise approaches to pedagogy or curriculum effectively. Poor, illiterate parents with limited school experience are at a particular disadvantage. The idea that the devolution of authority to parents, schools and communities is inherently pro-poor, is not well grounded. One of the defining characteristics of poverty and marginalisation in many contexts is precisely that those affected lack an effective voice (EFA, 2008). Decentralisation often involves a shift of responsibility onto local communities and these communities are then expected to provide resources and pay for teachers. It can thereby exacerbate inequalities in education systems, rather than improving the situations of remote and marginalised communities (Ansell, 2005).

In addition, formal opportunities for parental involvement and community participation are neither always implemented nor necessarily translated into influence (OECD, 2006). Dunne et.al (2007) refer to a review of decentralisation policy and practice in six sub-Saharan African countries (Ghana, Mali, Nigeria, Uganda & Zimbabwe) and conclude

that core education decisions are hardly ever decentralised in a way that encourages genuine local community participation in decision-making.

Several studies in different contexts, such as Indonesia (Chen, 2011), show that when accountability systems are weak at both the school and district level and there is little information shared with parents or parent awareness about how to hold schools responsible, decentralisation measures are ineffective as a means to involving parents in improving the management and quality of schools (Kingdon et.al, 2014). A recent report based on case studies of community's role in transparency and accountability of educational initiatives in US, some South American and Asian countries, highlights the important role communities can play in the ownership of schools and in ensuring accountability practices, transparency, and compliance with policies (UNESCO, 2014). The report highlights that community presence and participation in school display boards, local transparency committees, appeal mechanisms, social audits, and informal whistleblowing, are among key actions taken in the battle against corruption in education (UNESCO, 2014).

It is furthermore important to note that while parental and community involvement in school governance is widely promoted, little empirical evidence exists to show a direct relationship between parental involvements in governance and enhanced learning outcomes. Empirical studies in India and in Latin America suggest perverse or neutral effects (Banerjee et al., 2010, Mundy 2008). Based on the data from 12 cases, Neilson (2007) notes that none of the cases is there any evidence that community empowerment

has helped improve the quality of the teaching and learning in the classroom. However, it is argued elsewhere that parents can support education quality and learning outcomes through their role as instructional partners. A small body of evidence shows that interventions that include parents to support their children's learning are promising and valuable (Nag et al., 2014). Parental involvement may also positively affect teachers, as research shows that people who have close contact with schools – such as parents who assist in classrooms– often have much more positive attitudes towards teachers than people with little direct contact. This suggests that building stronger links between the schools and the community can help to enhance the status of teaching and, indirectly, teacher motivation and commitment (OECD, 2011).

In both developed and developing countries, there is also a gap between the structures that could in principle exist for parental participation and the extent to which they actually exist – a problem of implementation (OECD, 2006). In cases where such bodies and structures are created there are many barriers to effective participation for parents and community members, especially the poor. Research in various African and South Asian contexts has shown how there is unequal access to participation in bodies such as SMCs and PTAs according to socio-economic status, race, caste, social class, location, political affiliation and gender (Dunne et al., 2007). In poor rural locales in countries such as Ghana, the local elite and relatively more educated community members tend to take on the role of being the new brokers of decision-making and, through their actions, close up the spaces for representation and participation by a more inclusive group of community members in the affairs of schools (Kingdon et al., 2014). In addition, lack of

teacher and school leadership support in promoting parental and community engagement in school decision-making are also cited as significant barriers to effective participation. It is important to remove barriers at the most basic level and this means that all parents are informed about their rights and opportunities to have a say. The need for school leader training and teacher professional development in ways to encourage and facilitate parent involvement in school governance and in children's learning are emphasized in a few studies (OECD, 2006; USAID, 2011; Nielson, 2007; Save the Children, 2013).

2.4 Community partnerships in mathematics achievement

In every school across the country, students are taught and expected to learn mathematics, beginning with number recognition in kindergarten. Yet, international studies suggest that by the middle grades, U.S. students understand and know less mathematics than do their peers in many Asian and European countries (National Center for Education Statistics [NCES], 1999). Studies have shown that in the United States, female and minority students have lower achievement in mathematics and take fewer mathematics courses than do male and white students and that the gender and racial gaps are not narrowing (Hall, Davis, Bolen, & Chia, 1999; Mitchell, Hawkins, Jakwerth, Stanavage, & Dossey, 1999). Problems associated with students' mathematics proficiency are particularly serious in poor urban schools and in school systems (NCES, 1999). Concerns about the status, quality, and equity of mathematics education in many countries have fueled many mathematics reform initiatives at the national, state, and local levels. Explanations of why students in the United States struggle in mathematics concern; curriculum and instruction in classrooms, student attitudes about mathematics,

student readiness and background characteristics, and level of support for mathematics in home environments (Secada, 1992; Stevenson, Lee, & Stigler, 1986; Stodolsky, Salk, & Glaessner, 1991). Efforts to improve students' mathematics learning have focused on improved teacher education, modified curriculum, and school-wide and district-wide programs (Ball, 1993; Cuevas & Driscoll, 1993; Knapp, 1997; Smith & Hausafus, 1998). Professional groups have developed new standards for mathematics education that have influenced changes in mathematics instruction in many U.S. classrooms (Connected Math Project, 1995; National Council of Teachers of Mathematics [NCTM], 1991). In comparison with efforts to improve mathematics instruction in schools, researchers and practitioners have given relatively little attention to developing connections between schools, families, and communities as components of mathematics reform. Historically, parents have played important roles in some aspects of education reform (Bloch & Tabachnick, 1994). However, efforts to change mathematics education have positioned parents on the sidelines, leaving educators and other professionals to decide how mathematics learning should take place (Peressini, 1998). In some cases, parents have been characterized more as enemies to reform than as allies. For example, in his presidential address to the NCTM, Price (1996) suggested that parents are among the greatest threats to the implementation of the organization's new mathematics education standards. Although parent support for mathematics reform is desired, parent involvement in developing these reforms is not. At the school level, teachers are likely to support the concept of parent involvement; some educators encourage and guide parents to participate in their children's mathematics education and learning. Those efforts are supported by research that reports positive relationships between parent involvement and

diverse student outcomes including, but not limited to, mathematics (Cai, Moyer, & Wang, 1997; Epstein, 1991; Epstein, Simon, & Salinas, 1997; Henderson & Berla, 1994; Ho & Willms, 1996; Keith et al., 1993; Lee, 1994; Van Voorhis, 2001).

2.5 Mathematics Attitudes and Achievement

It is well accepted that children's home environments affect their attitudes toward mathematics (Balli, 1998; Parsons, Adler, & Kaczala, 1982). Researchers have shown that parents' beliefs and expectations for their children in mathematics predict student achievement in elementary and middle school mathematics (Entwisle & Alexander, 1996; Gill & Reynolds, 1999; Halle, Kurtz-Costes, & Mahoney, 1997; Holloway, 1986). Similarly, even after researchers controlled for students' prior achievement, learning activities and parent-teen discussions conducted at home predicted higher student mathematics achievement in middle and high schools (Cai et al., 1997; Ho & Willms, 1996; Keith et al., 1993; Pong, 1997). For all students to attain higher achievement, educators must support and facilitate parent involvement in mathematics. Sanchez and Baquedano (1993) showed that students whose parents met with a mathematics teacher and a counselor to discuss ways to help at home gained more in mathematics than did students whose families did not receive training in such meetings. Similarly, students whose parents attended training and information workshops and obtained materials to help their preschool children at home (Starkey & Klein, 2000) and elementary students at home (Shaver & Walls, 1998; Westat and Policy Studies Associates, 2001) made greater gains in mathematics achievement than did students whose parents did not attend the workshops. Those studies suggest the importance of providing families with support to

help their children succeed in mathematics. Schools also can use homework assignments to guide and strengthen home-school partnerships. For example, home work can be designed to encourage parent-child activities in specific subjects and to enable families to communicate more easily with teachers about homework assignments (Epstein, 2001; Epstein & Van Voorhis, 2001). Studies on the effects of interactive homework have reported increased homework completion and improved achievement in language arts and science in inner-city and suburban middle schools (Epstein, Simon, & Salinas, 1997; Van Voorhis, 2001). Interactive homework also has been associated with increased family involvement in students' mathematics learning at home (Balli, Demo, & Wedman, 1998). Overall, studies suggest that use of homework that requires parent-child interactions can; create a line of communication between parents and teachers, increase family involvement, and help improve student achievement.

2.6 Challenges to Parent Involvement in Mathematics

Compared with other school subjects, home-school partnerships in mathematics may be more difficult to organise and implement. Gal and Stoudt (1995) suggested at least three reasons why parents might not be involved in their children's mathematics education. First, as mathematics becomes increasingly more complex across the school years, parents may not have the content knowledge or teaching skills needed to help their children. Second, changes in the way that mathematics is taught in schools may result in parents' confusion or resistance to some of the new or non-traditional aspects of their children's mathematics schoolwork. Third, teachers are not trained to teach adults how to work on mathematics with their children. The three factors present significant obstacles

for some schools and may affect whether most or all parents are able to help their children learn mathematics at home. Teachers can help parents overcome the obstacles. For example, one elementary school teacher working in an urban setting realized that to help their children in mathematics, many parents first needed to become more fluent English speakers (Carey, 1998). The teacher began by helping parents improve their general English skills and vocabulary and then become familiar with vocabulary related to mathematics. She later asked parents to help their children with mathematics problems and made it clear on which skills the students would be tested. The example is noteworthy because it highlights the importance of teachers having thoughtful communication strategies that overcome challenges often present in large urban schools and which may otherwise hinder parent mathematics involvement.

2.7 Theoretical Background

The idea to use community participation in mathematics education in order to promote access and equity to quality basic education dates back to 1980s. This section is explicated in order to learn more about mathematics interventions rationale in technical terms by first elaborating on the different views on the momentum of mathematics reforms. In the second section of the theoretical framework, there will be zoomed in the general attitudes and beliefs parents have toward mathematics and the last section consists of an overview of the findings from actual research experience in the field of community participation in mathematics development.

2.7.1 Parents and mathematical reform

The initiatives identified in the literature and described in this paper occurred in the context of a wider mathematical reform movement. The momentum for reform in mathematics education began in the early 1980s (Van de Walle, 2004), with a change of focus from mathematics content to how students can best learn mathematics. Advocates of reform urged a move away from traditional teaching approaches which emphasised telling and practice of procedures (Olson & Barrett, 2004), to approaches which supported a constructivist view of learning (Van de Walle, 2004), in helping students construct meaningful conceptions of mathematical topics (Fraivillig, Murphy & Fuson, 1999). The reform movement was based on the recommendations of the NCTM Standards document (1989), and despite reform documents and organisations such as the NCTM advocating the need to work with parents (NCTM, 2000), Peressini (1998) maintained that parents have traditionally been seen as “impediments to the reform of mathematics education” (p. 14). He argues however, that parents have their own expertise and unique knowledge about their children and thus can contribute to their children’s mathematical development. Furthermore, those parents who had negative experiences in their own mathematical education may view reform recommendations in mathematics education as welcome changes that could result in more engaging and meaningful mathematical experiences for their children (Peressini, 1998).

As previously mentioned, the momentum for reform in mathematics education began in the early 1980s (Van de Walle, 2004), in response to a “back to basics” call to address community concerns about the state of mathematics education. Although “basic” means

different things to different people, it typically consists primarily of arithmetic or computation based on drill and practice (Cavenagh, 2006) and is the mathematics that parents and legislators recognise as the subject they were taught in schools. Reform-oriented approaches, on the other hand, are based on the recommendations made by the NCTM (1989) and involve a range of processes, such as problem solving, reasoning and proof, communication and reflection (Bobis & Anderson, 2006). Reform advocates want students to value mathematics and be confident in their ability to do mathematics (Van de Walle, 1999).

Consistent with the reform approach, is an increased emphasis on the need for students to develop a conceptual understanding of important mathematical ideas and an ability to connect these ideas, in order to build up a network or foundation on which to base future learning. According to Van de Walle (1999), reform and basics are not opposite ends of the same continuum; rather, the basics tend to be about content (specifically content that was common when today's adults were in school), whereas reform is much more about how children learn. The implications of establishing working partnerships between home and schools in the context of the reform movement mean that careful consideration needs to be given to the ways in which reform practices are communicated to parents and the extent to which teachers can expect parents to follow, implement and support reform practices. Edward & Warin (1999) found, for example, that there were considerable discrepancies between approaches recommended to 'volunteers' and their actual practice. In addition, they found that teachers were often unaware of the demanding nature of the tasks they were expecting parents to do and tended to under-estimate the professional

expertise of teachers. It is also important to acknowledge the tension that exists between how mathematics is taught today compared with how it was learned by parents (e.g., Civil, 2006; Marshall & Swan, 2010; Peressini, 1998). Many parents tend to value their own forms of doing mathematics (Quintos, Bratton & Civil, 2005) over ‘school mathematics’, while many children value schools’ form of knowledge over the parents’ knowledge, hence demonstrating the potential tensions that may arise when engaging in mathematical tasks and assignments at home. Adding to the potential for creating tensions, parents in Civil’s (2006) project expressed concerns that they were not familiar with the homework tasks set, and therefore unsure about the best ways in which to help their children. Similarly Muir (2009) found that only 36% of parents surveyed indicated that they had a good understanding of how their child was taught mathematics, and McNamara et al. (2000) also found that parents often expressed the desire for more help and direction from school with regard to how to help their child. Pritchard (2004) also found that many parents felt uninformed about the mathematics curriculum and the teaching methods used in their child’s school, thereby limiting the ways that they could be involved in their child’s mathematics education (Peressini, 1998). Without being informed about the rationale or purpose behind contemporary practices, there is a danger that parents may view practices, such as the use of games and manipulative materials, as time wasting and unproductive (Marshall & Swan, 2010; Onslow, 1992).

2.7.2 Parental attitudes and beliefs

Pritchard (2004) synthesised a number of studies that concluded there were links between parents' attitudes, perceptions and beliefs about mathematics and children's attitudes and performance in mathematics. Hall & Davis (1999; as cited in Pritchard, 2004), for example, claimed that parental attitudes influenced students' performance in mathematics and that parents communicated their beliefs and attitudes about mathematics through their individual practices. McNamara et al. (2000) found that parents' own lack of skill, knowledge and confidence was a recurring theme, with mathematics in particular being a source of much family worry. Other research findings indicate that many adults, in relation to mathematical tasks, admit to feelings of anxiety, helplessness, fear and dislike (Haylock, 2007). Issues of lack of confidence, of feeling inadequate at mathematics, and of feeling alienated were common among Civil's (2001) participants in the 'Mathematics for Parents' course. This is of concern as presumably many of these adults are parents who will potentially pass these feelings on to their children. Although many parents do consider mathematics to be important, they also tend to think it is dull and boring and based on the memorisation of rules and procedures (Onslow, 1992). Students' attitudes have been found to be strongly influenced by the attitudes of their parents (Onslow, 1992) so it would seem beneficial, therefore, to invest time and resources into addressing parents' perceptions of mathematics education. The other evolved when it was recognized that parents may be more willing to become involved in their child's mathematical education if they more fully understood the mathematics, along with being more informed about current mathematical pedagogical practices.

2.7.3 Parental involvement in mathematics projects

Studies have shown that students performed better academically and had more positive school attitudes if they had parents who were aware, knowledgeable and involved (Epstein, 1992, as cited in Anthony & Walshaw, 2007). Rich learning environments that incorporate meaningful mathematical experiences are associated with higher achievement and genuine home/school collaboration has also been found to lift children's achievement significantly (Biddulph, Biddulph & Biddulph, 2003). Results from a study conducted by Cai (2003) indicated that parental involvement is a statistically significant predictor of their children's mathematical achievement and also promoted positive behaviours and emotional development. Cai (2003) identified five parental roles in middle school students learning of mathematics: motivator, monitor, resource provider, mathematics content advisor, and mathematics learning counsellor. He concluded that the roles of motivator and monitor seemed to be the most important influences on children's problem solving performance. Cai's study also looked at the differences in parental support provided by Chinese and US parents; interestingly, only about 36% of Chinese parents indicated that they "knew enough about mathematics to help my child" (Cai, 2003, p. 97), supporting other findings that parental involvement tends to diminish with grade level, which could be attributed to the increasing complex nature of mathematics as students move through grades, with parents lacking the content knowledge or teaching skills needed to help their children (Sheldon & Epstein, 2005). In the United States, Civil (1998) has attempted to address lack of parental involvement through recognising that parents are valuable resources who can be utilised for mathematical instruction. Her research has focused on linking home and school, particularly in the context of working

class and immigrant families. A series of workshops, conducted in a similar way to professional learning provided to teachers, combined with home visits and interviews, provided valuable information about parents' everyday practices and experiences. Furthermore, the workshops contained reform-based activities which encouraged the use of non-traditional approaches with a focus on investigation – a contrast to what many of them experienced in their own schooling. Math and Parent Partnerships in the Southwest (MAPPS) aimed to assist parents to help their children with their school mathematics work and to develop leadership capital among parents (Quintos, et al., 2005), while Project BRIDGE (Linking home and school: A bridge to the many faces of mathematics) focused on parents learning mathematics with understanding (Civil, 2001). Both projects have realised the potential that parents have in terms of contributing positively to their children's mathematical education. Two major UK projects that are well documented in the literature are the IMPACT project (Merttens & Vass, 1993) and the Ocean Mathematics Project (Bastiani, 2004; Bernie & Lall, 2008). The IMPACT project began in London in 1985 and involved children and parents sharing regular mathematics activities together, with the results returned to the classrooms to inform the following week's work (Merttens & Vass, 1993). According to one of the teachers involved in the project, IMPACT helped make parents more confident in being involved in school activities and that they valued being an integral part of their child's education (Tye, 1993). Participating teachers viewed it as a way of showing parents the kind of mathematics that takes place in schools and reported that parents were now better informed about the need for practical experience, the power of games to motivate practice and the importance of paying attention to children's attitudes (Bristow, 1993). One of the

features of the program was the inclusion of a built-in facility for parents to respond to the activities, making them “no longer passive and compliant to the diet of learning that the school is feeding their children” (Morgan & Tremere, 1993, p. 66). The Ocean Mathematics Project began in 2001 and sought to “address under-achievement in mathematics by changing the attitudes and practices of schools, parents and children, specifically through involving their parents in their child’s mathematics learning process” (Bernie & Lall, 2008, p. 4). The project involves delivering workshops to parents and giving pupils specially designed homework, usually focused on games that children and parents or caregivers can play together. In contrast with IMPACT, the homework is given every two weeks, or five activities per term. Reports of the project have indicated an increase in pupil achievement (Bastiani, 2004), improvements in parents’ own mathematical understanding, transfer of methodology from teachers to parents and increased parental involvement in school life and in their child’s education generally (Bernie & Lall, 2008).

2.8 Chapter summary

The literature review has revealed that policy makers, educators and others involved in education have realised the significance and benefits of community participation in education. The review has recognised community participation as one of the strategies to utilise limited resources efficiently and effectively in order to identify and solve problems in the education sector and to provide quality education for children. However, it has been established that there are many gaps in the way community participation in education is being practiced. The formal opportunities for parental involvement are

neither always implemented nor necessarily translated into influence (OECD, 2006). There is limited evidence that community participation has helped improve the quality of teaching and learning in the classroom. The documentation of internationally implemented educational interventions which involve communities, particularly in the area of mathematics is limited. Although community participation in education is fundamental in Malawi, there is little attention paid to it especially in numeracy as evidenced by lack of documented cases.

CHAPTER 3

RESEARCH METHODOLOGY

3.0 Chapter overview

This chapter discusses how the study was carried out. It presents the research approaches that were employed during the study and the rationale for the choice that were made. Further, the chapter outlines the study area, sampling methods, data collection instruments that were used and how the data were analysed. This chapter concludes by highlighting the ethical considerations that were taken into account.

3.1 Research paradigm

In this study, the qualitative research methods were used to capture relevant information and understand stakeholders' experiences with the Numeracy Boost intervention. The study collected experiences, perceptions, opinions and views of the respondents in regard to the questions that guided the study. Therefore, qualitative approach was deemed appropriate for this study as subjects were observed, interviewed in their natural settings. Narman (1995) agrees that qualitative researchers tend to study things in their natural settings, attempting to make sense of, or interpret phenomenon in terms of the meanings people bring to them.

Within the qualitative approach, the study employed a case study design. A case study design is an exploration of bounded system overtime through detailed, in depth data collection involving multiple sources of information rich in context (Creswell, 1998). In this vein, the researcher found himself in the right environment, for him to understand how communities implement Numeracy Boost intervention in mathematics camps and observe why things are being done the way they are. Qualitative data was analysed by clustering common themes and writing stories as well as tallying and ranking of key informant responses to uncover main issues that were arising.

3.2 Study area

The research was carried out in the 56 primary schools and 550 villages of TA Chikowi in Zomba district. Zomba is in the southern region of Malawi which is a country in the sub-Saharan Africa. It is boarded by Tanzania to the north and north- east, Mozambique to the east, south and south -west and Zambia to the west and north- west. It is a land locked country with land area of 94,080 square kilometres. The country is divided into three regions: north, centre and south. The regions are sub-divided into districts with the north having six districts, the centre having nine and south having fourteen districts. Schools in the south suffer from high dropout rate, repetition, pupil classroom ratio and high pupil teacher ratio. The south has the lowest literacy levels of women (59.1%) and 79.1% (men) (ACEM, 2007).

Zomba district was chosen for this research because it is where the intervention is taking place. Another justification is that it is in TA Chikowi where the researcher has access to

information as Cresswell (1998) noted that ‘studying one’s backyard provides easy access to informants and information at a minimal cost (p. 115). Another justification for the choice was that the site was accessible because it was closer to the researcher’s residential area in which case the study was conducted without much economic stress as would have been the case if another area was chosen.

The majority of the population in this area speaks Chichewa as their native language. The rural areas from which children were sampled are very economically disadvantaged, with most of the population relying on agriculture for a living. Furthermore, there are also often not enough classrooms to accommodate the surging learner population and many classes are held outside under the shade of trees, often over 100 learners in the class. Shortage of teaching and learning resources is again one of the major challenges.

3.3 Sampling

The sample for the assessment was drawn from the 550 villages (where mathematics camps were established) in and around the 56 primary schools in TA Chikowi in Zomba district. The sample was selected using a stratified, two stage cluster design, with schools being sampling units for the first stage. A total of 12 intervention schools were purposely selected to represent all the 56 primary schools covered by the intervention. In the second stage, a listing of all villages (where mathematics camps were found) in and around the 12 selected schools were used to randomly select a total of 48 mathematics camps; at least 4 mathematics camps from around each of the 12 primary schools. Purposive sampling was used to select the 12 intervention schools because these were the schools

which started the implementation of Numeracy Boost before it was scaled up to 56 primary schools and that the respondents will have more to say about the intervention. Random sampling was used to select the camps because according to Gay (1987), all individuals in the defined population have an equal and independent chance of being selected for the sample. Below is the sample of respondents for the qualitative research instruments that were used in this study:

- 2 national level respondents – one from the Ministry of Education (Appendix 1), and one from Save the Children Country Office (Appendix 2).
- 2 district level respondents – one from the District Education Manager’s Office (Appendix 3) and one from Save the Children, Zomba field office (Appendix 4).
- School community level respondents included 2 PEAs and 12 Head teachers (Appendix 5), 12 teachers (camp supervisors) (Appendix 6), 48 camp facilitators (Appendix 7) and 12 Focus Group Discussions with parents, traditional leaders and camp facilitators (Appendix 9).

In total, there were 90 respondents sampled for interviews in this study.

3.4 Data collection instruments

A number of data collection instruments, in correspondence with the research questions and the qualitative research design were employed. There was a combination of tools to strengthen the credibility of the data and to collect a variety of information that addresses the specific questions of the study. The following are the data collection instruments that were used:

3.4.1 Checklist

A checklist (Appendix 7) was administered to camp facilitators in the 48 sampled mathematics camps (villages) to solicit information on the availability of resources and characteristics of camps. This included information on the enrolment, learner characteristics, attendance, and availability of resources among other things. This information contributed to the analysis of how operational mathematics camps look like.

3.4.2 Key informant interviews

The interview method was chosen because, “an interview is a useful way to get a large amount of data quickly,” (Marshall & Rossman, 1999, p. 108). However, interviews are highly subjective and therefore, there is a risk of being partial. This is why a variety of methods were used for triangulation purposes. A key informant guide was used to collect data from key informants. Key informants are key stakeholders that hold vital information concerning an intervention. According to this intervention, these were at national, district, school and community levels. At national level officials from Ministry of Education headquarters and Save the Children country office were targeted. The interviews focussed mainly on their involvement with Numeracy Boost mathematics camps, their views of the key activities of the camps and views on contribution and sustainability of such camps. At district level, the key informants included the District Education Manager (DEM) and the official from Save the Children, Zomba office. The questions again focussed on their involvement in the mathematics camps and activities, their views on the content, methodology, community involvement of the camps, the contribution of the camps to the mathematics ability of learners and sustainability.

Similarly at school level, head teachers, camp supervisors (teachers) and PEAs were talked to. This instrument collected additional information on the factors impacting on the functioning of the mathematics camps including the challenges encountered and sustainability issues. The information gathered through this instrument also assisted in identifying good practices.

3.4.3 Focus group discussions (FGDs)

Focus group discussions are a more systematic approach to group interviews where a facilitator seeks to focus the group discussion on specific themes of research interest and can serve to quantify data. The FDGs are conducted several times with similar types of participants, in order to identify trends and patterns in perceptions. FDGs are carefully planned series of relaxed discussions designed to obtain perceptions on a defined area of interest, in this case community participation in children's numeracy development, in a permissive, non-threatening environment. Each group is conducted with five to ten people, led by a skilled interviewer. These FDGs work when participants feel comfortable, respected and free to give their opinion without being judged (Krueger, 2009).

The FDGs in this study were formed using the existing structures that the intervention had already set and were done at school level. In total, there were 12 FDGs which included the traditional leaders, the parents and camp facilitators. Each FDG comprised 4 traditional leaders, 4 parents and 4 camp facilitators making a total of 12 participants. Purposive sampling was used to select these people because of their positions and roles

they play in the intervention. The FDG took place in a free building or under a tree. The participants were gathered by the head teacher and at the beginning of each FDG, they were introduced to the study and researcher and thereafter sensitized on the ethical issues surrounding the study. Each focus group took between one and two hours.

However, in focus groups, some people may be uncomfortable to speak in front of others. Not everyone can contribute and other people may not respect other people's views. Through the FGDs, respondents were engaged to articulate issues and opinions on the features of their camp activities, successes and challenges of mathematics camps and sustainability of the camps.

3.4.4 Mathematics camp lesson observation

Lesson observation is the most obvious way to identify good or bad practices since it is a valuable tool for improving the quality of teaching and learning (MoEST, 2006). Observation method is fundamental and highly important in all qualitative inquiry (Marshall & Rossman, 1999). The observations were conducted in each of the selected mathematics camps in the area. Camp supervisors arranged with camp facilitators on the day and time these lesson observations will take place in sampled villages/ camps. Each lesson observation took about one hour and after the observation, a 10 minute debriefing meeting was conducted. In total, 48 lesson observations were conducted. The observation schedule (Appendix 9) was used to collect information on the structure of the camps including the process of what goes on at the camp. Camp sessions were observed with emphasis on facilitator knowledge, attitudes and practice; student experience and

materials set up and space. The session delivery focussed on the following areas: Free play, attendance and bar graph, reading aloud the story, reinforcing activity, reflection and discussion and mental mathematics. The information collected helped to link the practices in camps to the learning that takes place in schools. It also assisted in identifying the good practices that need to be encouraged and those that need improvement. Observation of lessons enabled the researcher to capture what people actually do rather than what they say they do.

3.4.5 Document reviews

The desk review of Numeracy Boost manuals developed by Save the Children was made in order to understand the key issues and procedures intended by the project as noted by Cresswell, (2003) that during the process of research, the qualitative investigation may collect document. These were used to make comparisons with what happens with the camps in practice. This analysis helped to identify any gaps between the intentions and the practice.

3.5 Data analysis

Data analysis began as soon as data collection started as Cresswell, (2003) stated that data analysis is an on-going process which needs to be carried out alongside data collection. Without on-going analysis, the data can be unfocussed, repetitious and overwhelming in terms of large volume of material that needs to be processed. Given that only qualitative methods were used, the data collected was analysed qualitatively. The data was analysed by clustering common themes and writing stories as well as tallying

and ranking key informant responses to uncover main issues that were arising. The analyses of the data were triangulated to enable a more robust assessment of the camps.

3.6 Researcher's perspectives

Before ending this chapter, it is important to note that this study was influenced by a perspective that the researcher was charged with the responsibility to oversee the implementation of Numeracy Boost intervention as a Numeracy Boost officer for three years from January, 2013. The experience on how the intervention was being implemented helped the researcher to recognise if indeed the Numeracy Boost approaches were being used as expected or to see if the community stakeholders were just claiming to be using them. As an insider, however, the researcher collected data which was free from bias. In order to ensure credibility of the findings, the researcher played the role of a complete observer during the data collection process which was done by trained personnel and used multiple instruments which assisted in triangulating the data.

3.7 Ethical consideration

Ethical issues are fundamental in any research planning and implementation process. Ethical issues considered in conducting this study included obtaining an introductory letter from the Head of Education department giving confirmation to conduct the research; seeking permission or informed consent from all the respondents to participate in the research, and an explanation from the researcher as to the nature and purpose of the research. Confidentiality issues were adhered to throughout the process. Letters and

number codes were used to identify the respondents who participated in the study so as to ensure privacy and confidentiality.

3.8 Chapter summary

This chapter has looked at the methodologies which were employed in order to answer the research questions which guided the study. It has presented issues on the research approaches which were used, the area where the study was conducted, the research designs which helped to collect data and the data collection instruments used. Finally, the chapter outlined how the data was analysed and ethical issues which were accounted for.

CHAPTER 4

PRESENTATION AND DISCUSSION OF FINDINGS

4.0 Chapter overview

In this study, an investigation of community involvement in the implementation of Numeracy Boost was made in sampled schools of TA Chikowi in Zomba district. The presentations and discussions of findings are made in this chapter following the research questions that guided the study.

4.1 Involvement of communities in Numeracy Boost activities

The study found out that communities actively participate in the implementation of Numeracy Boost intervention in a number of ways. Table 1 below displays a summary of responses from traditional leaders, parents, camp facilitators, teachers and head teachers on how they get involved in mathematics camp activities.

Table 1: A summary of responses on how communities get involved

No.	Roles
1	Teaching mathematics to their children in camps and at home
2	Providing and producing teaching and learning resources
3	Supervising what goes on in mathematics camps
4	Encouraging each other to send children to mathematics camps
5	Monitoring attendance of camp facilitators and children in camps
6	Tracking learners to go to camps and schools
7	Constructing shelters for camp sessions and ensuring the safety of the place

The study revealed that traditional leaders, parents, camp facilitators and teachers play a number of roles in the implementation of Numeracy Boost intervention. For instance, responses from traditional leaders indicated that they are mainly involved in encouraging parents to send their children to camps and school and supervising what goes on in camps. They also monitor attendance of learners and camp facilitators as well as assist in provision of manipulatives. On encouraging parents to send their children to camps, most traditional leaders indicated that they conduct meetings with parents where they encourage one another on the importance of sending their children to mathematics camps as traditional leader TL 7 was quoted saying;

"I conduct meetings with my subjects and during these meetings we make by-laws and one of it is that parents who do not send their children to schools and later to camps should pay a fine of K1 000 per school day" (Traditional leader TL 7).

However, it was also established that during this study that some traditional leaders keep a distance on anything to do with mathematics camps. Some of such Traditional leaders claimed that they were not oriented and hence they did not want to interfere with whatever happens in camps. This is what traditional leader TL 2 had to say;

"Village heads do not know what happens in mathematics camps. It is therefore important that they should also be invited to meetings or trainings of camp facilitators so that they should also enjoy a bottle of Fanta which is given there while being oriented for them to participate fully in Numeracy Boost activities" (Traditional leader TL 2).

To the contrary, Save the Children official reported that before any activity is implemented in the area, sensitisation meetings are held to fully orient traditional

leaders and communities at large about the new intervention. However, there have been reports that some traditional leaders demand a share of the lunch allowance once the camp facilitators attend their trainings implying that these leaders want a stipend for them to participate fully.

On the other hand, parents also play their important part in the implementation of Numeracy Boost activities. It was mentioned by most of them that they assist in developing manipulatives for use in mathematics camps. There was evidence of locally made manipulatives like counters, 2 - D and 3 – D models, number cards, number lines and many more, made by parents with the assistance from camp facilitators and camp supervisors. The parents also get involved in monitoring learning at the camps as well as help solve problems that may deter the success of the mathematics camps. It was also learnt that other parents go as far as teaching the learners when the camp facilitators are absent. Parents also get involved in the teaching of their own children at home, a component known as ‘mathematics at home.’

Despite the fact that parents take an active role in the implementation of Numeracy Boost activities, this study discovered that some of the camps stopped operating for a long time due to laxity of camp facilitators who only appear to camps when training are close by. Some parents also do not see the importance of sending their children to camps and prefer to engage them in income generating activities during camp sessions although some positive achievements from camp activities are discernible.

The findings above are in line with what Zellman & Waterman, (1998), as cited by Pishghadam & Shayesteh, (2013), found out. They contend that the concept of parents' involvement appears to be a complex construct relying on the premise that parents may display a wide variety of behaviors in responding to their children's schooling and education. Pishghadam & Shayesteh, (2013) also argued that since behaviors reflect beliefs and influence individuals' ultimate intentions, parents' underlying beliefs concerning schooling and different didactic issues may be an indispensable key to understanding the diverse activities that parents engage in with their children.

It was also observed that traditional leaders are central to any successful project in the communities. In villages where the leaders were vibrant and in support of the intervention, parents were also excited and very willing to render their efforts. Any attempt which bypasses the traditional leaders at any stage of development is not supported fully and eventually dies out before bearing good fruits.

Head teachers and teachers also play their advisory and supervisory roles in the implementation of Numeracy Boost activities. It was established that teachers act as the link between the school and the community and provide anchorage to the intervention. Teachers provide mentorship and coaching skills to camp facilitators and parents for them to ably support their children in camps and at home. They assist parents on how to produce locally available manipulatives and in some cases

share the little resources available from schools. However, teachers also needed to be closely monitored to make sure that they do not bring the classroom climate into the mathematics camps where children are stress - free and learn joyfully in a relaxed environment. It was also noted that a tension there exists between how mathematics is taught in mathematics camps compared with how it is learned by children at school.

The findings above are in consistent with several research findings. Various studies points that learning does not occur exclusively in schools. Parents can embark on encouraging their children's learning by valuing and underscoring education as a path toward a better life (Korkmaz, 2007). Parents can contribute insights and knowledge that complement the professional skills of school team (Comer & Haynes, 1991). Parents' meaningful involvement in their children's education is a sort of investment made by parents for the future prosperity of their children (Smits & Hosgor, 2006). Although, there are multiple causes for low academic achievement of students, lack of cooperation among schools, parents, and their communities has been found to have a critical role in this vein (Scribner, Young, & Pedroza, 1999). Nowadays, the productive partnerships between parents and teachers are considered rather vital in educational attainment. In a learning community, students, teachers, administrators, and parents are deemed as equal participants to mingle the in-and-out-of-school learning experiences (Day, 2000). The rationale behind developing this mode of partnership is to boost learning opportunities (Warren & Young, 2002). Several studies (Purcell-Gates, 2000) have

documented the link between parent involvement and a broad range of schooling outcomes, claiming that when children's learning is supported at home, a positive academic achievement is shown at school.

4.2 Factors that have enabled communities to get involved in Numeracy Boost activities

The study found out that there are a multiplicity of factors behind the community involvement in numeracy development in mathematics camps and mathematics at home activities. The table 2 below gives a summary of some responses from teachers, traditional leaders, camp facilitators and parents in the school community.

Table 2:A summary of enabling factors for communities to get involved

No	Enabling factors
1.	Improved learner achievements in mathematics at school
2.	Increased understanding of community support to children's education
3.	Provision of incentives
4.	Mitigation to long distances to school for young children
5.	Increased understanding that education is essential in life
6.	Passion to improve the poor standards of educational outcomes
7.	As pass time due to unemployment

The discussion above clearly indicates that communities give support to Numeracy Boost activities for a wide range of reasons. Most parents cited improved learner achievement

in mathematics as the greatest factor followed by the increased understanding of community support towards their children's education, the increased understanding that education is essential for life and then mitigation to long distances for young children. The other reasons included passion for the lowering educational standards, poor performance of children in schools as parent P4 lamented;

“In the past, children were able to read, write and solve simple mathematics in Standards 1 and 2, but these days our children are reaching even Standard 8 without attaining the necessary competencies for them to go for further education or be productive citizens in the society.”(Parent P 4).

Further, some camp facilitators and teachers mentioned the provision of incentives like lunch allowances during trainings and provision of promotional materials like T – shirts and caps as some of the motivating factors. Only very few camp facilitators participate to these events as pass time because they have not yet found something to do for them to earn a living.

However, the research revealed that the main reason for camp facilitators and teachers to engage themselves in Numeracy Boost activities could be the provision of incentives because oftentimes they have been pressing for frequent trainings not because they want to acquire more skills per se but because it is during these trainings they get monetary benefits. Many parents were excited with the improved performance of their children at school due to the establishment of these camps, so they felt the need to take part to maintain the trend. Traditional leaders thought if they actively take part in the implementation of this project, later on permanent structures would be constructed in their villages which might also be used for other purposes as well. This culminated in the

way Traditional leaders pushed for the moulding and burning of bricks and consistently asking for help to construct permanent structures. This is what Group Village Headman TL5 said:

“I have tasked all my village heads to mould and burn bricks by the end of this year so that your organisation and others serious in education assist us with permanent and beautiful infrastructures like those I saw at”(Group Village Headman TL 5)

These results concur with what other studies reported. Extensive literature by World Bank, (1995b), has shown that the goal of any kind of activity that attempts to involve communities in education is to improve education delivery so that more children learn better and are well prepared for the changing world. Furthermore, parents are usually concerned about their children’s education, and often are willing to provide assistance that can improve the educational delivery, ensuring that teachers are arriving at schools on time and perform effectively in the classrooms. Other studies also note that parent involvement in children’s learning is associated with increased achievement and academic performance, improved self-regulation, fewer discipline problems, stronger homework and study habits, improved work orientation, more positive attitudes toward school, and higher educational aspirations (Fan & Chen, 2001). These benefits are evident even after taking into account students’ abilities and socioeconomic status (Domina, 2005).

4.3 Challenges communities are facing as they implement Numeracy Boost activities

This study found that although communities are keen to assist in the numeracy development of their wards, they face lots of challenges which prevent them from achieving their intended purposes. The table 3 below gives a summary.

Table 3: A summary of challenges faced by communities

No	Challenges
1.	High illiteracy levels of community members
2.	The notion that educating children is the government's role
3.	Their busy schedule to fend for their families
4.	The notion that mathematics is difficult
5.	Laxity of some camp facilitators
6.	Lack of materials for use in camps and at home
7.	Religious and cultural interferences
8.	Resistant communities / families

The study revealed that communities encounter some obstacles as they make efforts to improve the educational status of their children. Some parents and camp facilitators pointed to their own demanding schedules and say they don't have enough time to volunteer or even attend schools activities because they have to fend for themselves and their families. Other parents reveal that they themselves did not go far with school and they feel uncomfortable to assist their children because they don't know what and how to help them. Some say mathematics used to be a problem during their own schooling time and to be asked to assist their own children in this subject area makes many feel uneasy. Other parents say they lack knowledge about what goes on in the school system and resources to help their children as parent P8 was quoted saying;

"I myself did not go to school and do not know what happens there. It is really difficult to assist in the teaching of my own children. That is why

many of us here just look on except when the work involves the supply of labour.”(Parent P8).

Some parents complain that they rarely hear from the school unless there is a problem with their child’s behaviour or performance due to poor relationships between school and community. Resisting communities, religious and cultural interferences were also mentioned as ingredients to challenges that affect the implementation of numeracy development in communities.

Camp facilitators reported that their main obstacles are inadequate teaching and learning resources, learner absenteeism and un-favourable learning environment. It was noted that most camp sessions take place in open sky which becomes difficult to conduct lessons during adverse weather conditions. It was also mentioned that although every camp is assigned to two camp facilitators, preferably, one male and the other female, it was mainly the female facilitator who frequently comes at the camp to assist the learners while males hardly fail to attend the trainings, probably because of the allowance they get.

It should also be noted that while some schools have made great strides in engaging communities in the educational process, there is still much more that can be done because some parents are still hesitant to take part in the education of their children. This research found out that many challenges in this area had their roots in the cultural aspect particularly because of the matrilineal marriage system. It was noted that female participation dominated male participation because where the matrilineal marriage system is practiced, husbands stay at their spouses’ homeland and have no much powers

over their own children and it becomes worse with step - children. As a result, they don't support much in the education of their children especially girls who are considered important helpers in the household.

The results discussed above are in support with what Bushell and Esgles, (2007), also stated. They noted that education as a phenomenon of affluent contemporary societies is particularly a difficult concept in communities in developing countries to grasp. As a consequence, community participation may be unacceptable for educational development. Hence building capacity is necessary for stakeholders involved in educational planning and development. Although community participation can be a strong tool to tackle some educational problems, it is not a universal remedy that it can solve all the problems encountered in the education sector. Any strategies to achieve a high degree of community participation require a careful examination of communities because each community is unique, and complicated in its nature.

4.4 Sustainability plans for Numeracy Boost activities without external support

The study also intended to establish if communities are prepared to take over and continue implementing the intervention without external support. During the study issues of sustainability could be seen from the procedures followed in the implementation of the intervention. The table 4 below shows a summary of responses from various stakeholders as regards how communities are going to sustain mathematics camps and mathematics at home activities:

Table 4: A summary of responses on sustainability plans for Numeracy Boost activities

No	Sustainability plans
1.	Whole community involvement to ensure ownership of the intervention
2.	Selection of camp facilitators from within the community
3.	Capacity building of all community structures
4.	Use of locally available resources as manipulatives
5	Payment of salaries or provision of incentives
5.	Involvement of parents in production of manipulatives
6.	Encourage the spirit of volunteerism among community members
7.	Use of permanent structures as learning centres
8.	Strong linkages between schools and camps through camp supervisors
9.	Involvement of traditional leaders at all levels of development
10.	Robust monitoring of Numeracy Boost activities in collaboration with school staff

The study revealed that community ownership was one of the major requirements for several groups of respondents namely head teachers, teachers, traditional leaders, camp facilitators and parents. There is indeed need for communities to own the intervention because the Ministry of Education seemed to be not ready to have these camps mainstreamed into the education system. The Ministry of Education official from the ministry's headquarters had this to say:

“The mathematics camps are not yet within the Ministry’s jurisdiction, they belong to the community which is outside the school system. However, I would want to encourage teachers and other stakeholders to get any lessons learnt and see how they can incorporate the good practices from the intervention into the formal education system.”(Official, MoEST).

Payment of salaries or some sort of incentives to camp facilitators emerged another major issue although it is against the spirit of volunteerism. It was noted that most teachers, traditional leaders, and parents pointed at it as another major priority for sustainability of camps. Surprisingly, very few camp facilitators mentioned this perhaps because they understand the concept of volunteerism. Ironically, the camp facilitators kept on asking for frequent trainings because that’s where they could get allowances. They also asked for increased lunch allowances and transport re-imbursements and also wished they received bicycles as incentives.

The study also revealed that teachers, parents and traditional leaders saw construction of permanent shelters for the mathematics camps as another recipe for sustainability since learning under the tree has proved difficult during adverse weather conditions. For camp facilitators, provision of durable teaching and learning materials was another top issue for sustainability. This requirement, however, was also supported by parents who themselves are expected to take part in the making of locally available materials. The head teachers, on the other hand, added that increased supervision of camp facilitators by school staff was essential for sustainability purposes since some camp facilitators report existence of camps which are in fact not functional.

This study found out that the payment of stipends and/or provision of other incentives are the major ingredients in poverty stricken areas where the spirit of volunteerism has diminished due to misunderstandings of democratic values. The researcher noted that it would be difficult for communities to sustain mathematics camps in the absence of the monetary benefits, although there were all those sustainability strategies put in place. It appears all the sustainability issues which have been raised above are far from being absorbed by the different stakeholders in the community despite a positive general agreement among them.

Lovell, 1992, agrees with these results by pointing out that one of the major factors to ensure sustainability of programmes is the availability of funds, whether from governments, private institutions, or donor organisations. In this regard, community participation in education cannot ensure the sustainability of schools by itself since communities oftentimes have to rely on external funding to keep the programme persistent. However, involving community is a way to ensure that the benefits brought by a development programme will be sustained after the external interventions are stopped. Thus, sustainability is dependent on the degree of self-reliance developed in target communities and on the social and political commitment in the wider society to development programmes that support the continuation of newly self-reliant communities. Community members are expected to be actively involved in the process of interventions through planning, implementation, and evaluation. Furthermore, they are expected to acquire skills and knowledge that will later enable them to take over the project or programme.

4.5 Numeracy Boost activities that are supportive of the teaching and learning in schools

In this study camp sessions were observed to establish the extent to which they were being implemented. The observation tool (Appendix 8) was designed to capture the following elements: Facilitator knowledge, attitude and practice; children experience and material setup and space.

4.5.1 Facilitator knowledge, attitude and practice

The study revealed that most camp facilitators in the sample used guides and followed strictly well all the steps as stated therein like stating the topic of the day's session, the objectives to be achieved and the title of the story to be read. It was also noted that in the camp sessions that were observed the camp facilitators prepared materials for teaching and learning and the majority of the mathematics camps gave their learners adequate time to play with items in the book bank (a kind of mobile library) before the actual start of the sessions. Camp facilitators distributed questions in random order to both girls and boys. In almost all the camp sessions that were observed, camp facilitators used a story to read to children from the story books. Where individual help was not practically possible due to large numbers, camp facilitators used buddy system to maximise learning as lamented by camp facilitator CF2 below:

"I normally have 123 to 150 children per session and this makes it difficult to reach out to every learner, hence I attach learners who are struggling to higher performing learners to assist them."(Camp facilitator CF2).

This is what buddy system is all about and is extended even to family and school levels. It was also learnt during the study that the methodologies used such as songs, mathematics games, dances, plays, group work, and others were responsive and suitable to the abilities of the learners as evidenced by the joyful learning observed in camps visited.

However, some camp facilitators still had problems to follow what was stipulated in the guide book due to several factors like low education, substitute facilitators replacing those who were adequately trained and unpreparedness. The study found out that the majority of the camp facilitators were not selected following the procedures as stipulated in the guide book but were simply handpicked by those with authority, hence, it was doubtful if those selected had the required qualifications.

4.5.2 Children experiences

Under this element, the study revealed that learners start playing either with balls or other games while waiting for actual camp sessions to begin. It was also established that there was active participation of children throughout the camp session because they were given a variety of exercises or games to practice numeracy skills; girls and boys were mixed and interacted freely during camp sessions. In terms of reinforcement, it was noted that the camp facilitators praised both boys and girls in ways that also brought fun and encouragement to learners as evidenced by the keenness that the learners showed in raising hands so as to be chosen to respond to questions raised. In situations where some learners displayed bad behaviour, the camp facilitators corrected the bad behaviours

immediately by either talking to the offender not to continue with that behaviour or by relocating the offender.

The findings above revealed that there is a lot of excitement in most mathematics camps which varied from one camp to another depending on the artistic nature of the facilitators. While children flocked to camps in their large numbers in many camps, in some camps they shunned the sessions because the camp facilitators were incompetent to handle a multi – grade class as they were trained despite having all the resources at their disposal.

4.5.3 Material set up and space

It was also observed that there were a variety of clean and attractive displays at appropriate height in most of the camps visited. Generally the camp content especially the stories were culturally relevant and familiar to the everyday lives of learners. It was seen during this study that the majority of the camp sessions used relevant locally available resources although not adequate enough to suffice the learners' enrolment.

The findings of this research have established that there is a strong link between what is practised in mathematics camps and the learning that takes place in schools. Interviews with various stakeholders including head teachers, teachers and camp facilitators revealed that the content of the curriculum in mathematics camps is similar to what is taught in schools, the only difference is the playful manner in which mathematics sessions are conducted. Apart from that, most head teachers and teachers also reported that learners who attend mathematics camps perform much better in schools, do not cause problems in class and are very active. This is what teacher T7 from school 204 had to say;

“My work is made easier with the establishment of these mathematics camps. I can tell which learners attend camps because they are quick at answering questions correctly, they are active in class and are even eager to teach other children. I don’t have many problems with them.”(Teacher T7).

Most teachers in schools visited reported that the performance of learners at school has generally improved due to camps. This is an indication that what learners do in mathematics camps is very supportive to the learning that takes place in schools because learners find it easier to understand what they are taught at school.

4.6 Chapter summary

This chapter has presented and discussed the findings of the study in the light of the analysis of data collected. The major findings of this study include that the Numeracy Boost intervention is having an effect on the development of mathematics skills among learners in schools where it is being implemented. These results concur very well with interview findings from various respondents in the study. The study has also uncovered the factors which have enabled communities to positively contribute towards the success of the initiative, the challenges encountered and what they plan to do to sustain the intervention. The study then revealed the practices in mathematics camps that are supportive of the teaching and learning in schools.

CHAPTER 5

CONCLUSIONS AND IMPLICATIONS

5.0 Chapter overview

In this chapter an attempt has been made to present a conclusion to the study. In addition, it has given the implications of the study should the intervention be replicated to other places and areas for further studies.

5.1 Conclusion

The attainment and fine-tuning of numeracy skills in children are influenced by a number of associations, practices, individual persons and children themselves. Schools, markets, churches, parents, peers and the wider community are all involved in influencing children's advancement towards their self-actualization and social responsibility. This is obviously what has come out from this study.

The general findings from this study clearly show that community involvement in the implementation of Numeracy Boost intervention is having a positive effect on the development of mathematics skills among learners in schools where it is rolled out. It has been noted from the interview data findings from various respondents in the study that children who attend mathematics camps, in most cases, are active in class activities and outperform those who do not attend these camps. This finding can be attributed to fact

that communities also impacted positively to the performance of their children through what is called ‘mathematics camps’ and ‘mathematics at home’ sessions. In addition, the study has also uncovered the factors which enabled communities to positively contribute towards the success of the intervention and they include a general positive learning outcome from their wards and the provision of incentives. However, the study also noted that there are a lot of challenges that hinder the effective implementation of the intervention and these include high illiteracy levels among community members, inadequate teaching and learning resources and loss of the spirit of volunteerism. The study also found out that some communities have devised strategies of coping with the challenges like construction of permanent structures for mathematics sessions and producing locally available resources for use in camps in order to sustain the intervention. The study then revealed the practices in mathematics camps which are supportive of the teaching and learning that takes place in schools.

All in all, community involvement in their children’s practices positively affects their academic performance and is a more powerful force for academic success. Parents have the greatest influence on the achievement of their children through supporting their learning at home rather than supporting activities at school (Uemura, 1999). It is therefore important to encourage communities to support numeracy education of their children in their localities if they are to acquire solid educational foundations for future successes. The study therefore established that with creativity, interest and positive attitudes, community participation is practical in Malawi, of course, with some adaptations in view of the practical realities on the ground.

5.2 Implications of the study

In view of the findings, it is suggested that camp facilitators must be provided with incentives in the form of stipend, increased lunch allowances, T-shirts and bicycles. Communities can be engaged in some ways to motivate the camp facilitators. Permanent structures for conducting camp sessions should be constructed wherever possible. There is need to intensify training for community structures for them to internalize techniques and improve their implementation in camps. SCI staff and other partners should ensure a robust monitoring and supervision framework to ensure that camps are functioning accordingly and that records are appropriately updated. There is need to encourage interactions between schools and communities to ensure that practices from both sides are supporting each other. There is need for traditional leaders to implement measures to ensure that the whole community is involved in their children's education. There is need for appropriate measures with various stakeholders before phasing out support to enhance community ownership. There is need to develop and pass community – friendly policies and laws for communities to participate in education related activities.

5.3 Areas for further study

Conducting research and evaluation on community participation in education are fundamental both for the organisation working in the areas and for the overall development of the communities. There is need to conduct a cost – effective study on parent and community influence on mathematics curriculum and how that affects curriculum relevance and children learning. Finally, there is need to conduct a

comparative research on the merits of different types of interventions, particularly in mathematics, that involve parents and communities in education.

5.4 Chapter summary

This chapter has presented the grand conclusion of the study. It has also given suggestions for improvement of community involvement in the implementation of Numeracy Boost intervention. Areas that need further research have also been highlighted in this chapter.

REFERENCES

- ACEM, (2007). *Promoting access and equity through community participation*. Lilongwe: ACEM, Basic Education Support Program.
- Afridi, M., Anderson, S., & Mundy, K. (2014). *Parent and community involvement in Education: A rapid review of literature*. Ontario: Ontario Institute for Studies in Education. University of Toronto.
- Ansell, N. (2005). *Children, youth and development*. USA: Routledge (Taylor & Francis Ltd)
- Anthony, G., & Walshaw, M. (2007). *Effective pedagogy in mathematics/Pangarau*. Wellington, NZ: Ministry of Education.
- Ball, D. L. (1993). With an eye on the mathematical horizon: Dilemmas of teaching elementary school mathematics. *Elementary school journal*, 93, 373-397.
- Balli, S. J. (1998). When mom and dad help: Student reflections on parent involvement with homework. *Journal of research and development in education*, 31(3) 142-146.
- Balli, S. J., Demo, D. H., & Wedman, J. E (1998). Family involvement with children's homework: An intervention in the middle grades. *Family relations*, 47, 149-157.
- Banerjee, et al. (2010). Pitfalls of participatory programs: Evidence from a randomized evaluation in education in India. *American economic journal: Economic policy* 2010, 2, 1, 1–30.

- Barnett, E. (2013) An analysis of community involvement in primary schools in Malawi. *International journal of educational development*, 33, 497-509
- Bastiani, J. (2004). Ocean mathematics project: A follow-up review. In T. Muir, (Eds.) *Numeracy at Home: Involving parents in Mathematics Education*, (pp. 1 – 13) Wellington, NZ: University of Tasmania.
- Bernie, J. & Lall, M. (2008). Building bridges between home and school mathematics: A review of the ocean mathematics project. In T. Muir, (Eds.) *Numeracy at Home: Involving parents in Mathematics Education*, (pp. 1 – 13) Wellington, NZ: University of Tasmania.
- Biddulph, F., Biddulph, J., & Biddulph, C. (2003). *The complexity of community and family influences on children's achievement in New Zealand: Best evidence synthesis*. Wellington, NZ: Ministry of Education.
- Bloch, M. N., & Tabachnick, B. R. (1994). *Improving parent involvement as school reform: Rhetoric or reality?* Albany: SUN Y Press.
- Bobis, J. & Anderson, J. (2006). Reform-oriented teaching practices and the influence of school context. In P. Grootenboer, R. Zevenbergen & M. Chinnappan (Eds.), *Identities, cultures and learning spaces* (Proceedings of the 29th annual conference of the Mathematics Education Research Group of Australasia, Canberra, pp. 92-98). Adelaide, SA: MERGA Inc.
- Bray, M. (1996). *Decentralization of education: Community financing*. Washington DC: World Bank
- Bray, M. (2000). *Community partnerships in education: dimensions, variations and implications*. (EFA thematic study, Dakar). Washington DC: World Bank...

- Bristow, D. (1993). *IMPACT in the urban authority*. In R. Mертtens & J. Vass (Eds.), *Partnerships in maths: Parents and schools the IMPACT project*. London, UK: Falmer Press.
- Bushell, R., & Eagles, P. eds. (2007). *Tourism and protected areas: Benefits beyond boundaries*. London: CAB International, UK.
- Cai, J. (2003). Investigating parental roles in students' learning of mathematics from a cross-national perspective. *Mathematics education research journal*, 15(2), 87-106.
- Cai, J., Moyer, J. C, & Wang, N. (1997, March). Parental roles in students' learning of mathematics: An exploratory study: Paper presented at the annual meeting of the American Educational Research Association, Chicago.
- Carey, L. (1998). Parents as math partners: A successful urban story. *Teaching children mathematics*, 4, 314-319.
- Catsambis, S. (2002). Expanding knowledge of parental involvement in children's secondary education: Connections with high school seniors' academic success. *Social psychology of education*, 5, 149-177.
- Catsambis, S., & Beveridge, A. A. (2001). Does neighborhood matter? Family, neighborhood, and school influences on eighth grade mathematics achievement. *Sociological focus*, 34, 435-457.
- Cavanagh, M. (2006). Mathematics teachers and working mathematically: Responses to curriculum change. In P. Grootenboer, R. Zevenbergen & M. Chinnappan (Eds.), *Identities, cultures and learning spaces: Proceedings of the 29th annual conference of the Mathematics Education Research Group of Australasia*, Canberra, (pp. 115-122). Adelaide, SA: MERGA Inc.

- Chen, D. (2011). *School-based management, school decision-making and education outcomes in Indonesian primary schools. Policy Research Working Paper Serie 5809*. Washington, DC: The World Bank.
- Chimombo, J., Mwale, L., & Ndalama, L. (2006). *An assessment of schooling conditions and standard one achievement levels in pre- literacy, pre- numeracy, basic literacy and numeracy in Malawi primary schools PCAR standard 1 baseline study*. Lilongwe: Ministry of Education.
- Civil, M. (2006). Working towards equity in mathematics education: A focus on learners, teachers, and parents. In S. Alatorre, J.L. Cortina, M. Sáiz, & A. Méndez (Eds.), *Proceedings of the twenty eighth annual meeting of the North American chapter of the international group for the psychology of mathematics education* (Vol. 1, 30-50). Mérida, Mexico: Universidad Pedagógica Nacional.
- Comer, J. P., & Haynes, N. M. (1991). Parents involvement in schools: An ecological approach. *The elementary school journal*, 91(3), 271-277.
- Connected Math Project. (1995). *Getting to know CMP: An introduction to the Connected Mathematics Project*. East Lansing: Michigan State University.
- Cresswell, J. W. (2003). *Research design: Qualitative, quantitative and mixed approaches*. London: SAGE Publications, Inc.
- Cresswell, J. W. (1998). *Qualitative inquiry and research design: Choosing among five traditions* (2nd ed.). London: SAGE Publications, Inc.
- Cuevas, G., & Driscoll, M. (1993). *Reaching all students with mathematics*. Reston, VA: National Council of Teachers of Mathematics.

- Day, C. (2000). Teachers in the twenty-first century: Time to renew the vision. *Teachers and teaching: Theory and practice*, 6, 101-115.
- Desimone, L. (1999). Linking parent involvement with student achievement: Do race and income matter? *Journal of educational research*, 93, 11-30.
- Dill, B. (2009). The paradoxes of community - based participation in Dar es Salaam. *Development and change*, 40, 717-743.
- Domina, T. (2005). Leveling the home advantage: Assessing the effectiveness of parental involvement in elementary school. *Sociology of education*, 78, 233-249.
- Dunne, M, Akyeampong, K. & Humphreys, S. (2007). *School processes, local governance and community participation: Understanding access*. CREATE, Research Monograph, No.6 London: University of London.
- Edward, A. & Warin, J. (1999). Parental involvement in raising the achievement of primary school pupils: Why bother? *Oxford review of education*, 25(3), 325-341.
- EFA (2009). *EFA global monitoring report: Overcoming inequality: why governance matters*. Oxford: University press; UNESCO publishing
- Entwisle, D. R., & Alexander, K. L. (1996). Family type and children's growth in reading and math over the primary grades. *Journal of marriage and family*, 58, 341-355.
- Epstein, J. (1995). School/family/community partnerships: Caring for the children we share. *Phi Delta Kappan*, 76(9), 701-711.

- Epstein, J. (2001). *School, family, and community partnerships: Preparing educators and improving schools*. Boulder, CO: Westview Press.
- Epstein, J. L. (1991). Effects on student achievement of teacher practices of parent involvement. In S. Silvern (Ed.), *Literacy through family, community, and school interaction*. (pp. 261-276). Greenwich, CT: JAI.
- Epstein, J. L. (1995). School/Family/Community partnerships: Caring for the children we share, *In Phi Delta Kappan*, 76 (May), 701-712.
- Epstein, J. L., Lucretia, C., Karen, C. S., Mavis, G. S., & Beth S. S. (1997). *School, family, and community partnerships: Your Handbook for Action*. Thousand Oaks, ERIC: ED 415 003
- Epstein, J. L., Sanders, M. G., Simon, B. S., Salinas, K. C, Jansorn, N. R., & Van Voorhis, F. L. (2002). *School, family, and community partnerships: Your handbook for action (2nd ed.)*. Thousand Oaks, CA: Corwin.
- Epstein, J. L., Simon, B. S., & Salinas, K. C. (1997). Involving parents in homework in the middle grades (Research Bulletin No. 18). Bloomington IN: Phi Delta Kappa /CEDR.
- Fan, X., & Chen, M. (2001). Parental involvement and students' academic achievement: A meta-analysis. *Educational Psychology Review*, 13, 1-22.
- Fraivillig, J. L., Murphy, L. A., & Fuson, K. C. (1999). Advancing children's mathematical thinking in everyday mathematics classrooms. *Journal for research in mathematics education*, 30(2), 148-171.

- Gal, I., & Stoudt, A. (1995). *Family achievement in mathematics*. NCAL Connections. Philadelphia: National Center on Adult Literacy, University of Pennsylvania.
- Gay, L. R. (1987). *Education research competencies for analysis and application*. Toronto: Merrill Publications Company.
- Gill, S., & Reynolds, A. J. (1999). Educational expectations and school achievement of urban African American children. *Journal of school psychology, 37*, 403-424.
- Groves, S., Mousley, J., & Forgasz, H. (2006). Primary Numeracy: A mapping, review and analysis of Australian research in numeracy learning at the primary school level. Canberra, ACT.
- Hall, C. W, Davis, N. B., Bolen, L. M., & Chia, R. (1999). Gender and racial differences in mathematical performance. *The journal of social psychology, 139*, 677-689.
- Halle, T. G., Kurtz-Costes, B., & Mahoney, J. L. (1997). Family influences on school achievement in low-income, African-American children. *Journal of educational psychology, 89*, 527-537.
- Hanushek, E. A., & Woessmann, L. (2012). Schooling, educational achievement, and the Latin American growth puzzle. *Journal of development economics, 99*, 4512. doi: 10.1016/j.jdeveco.2012.06.004
- Haylock, D. (2007). *Mathematics explained for primary teachers (3rd ed.)*. Thousand Oaks, CA: Sage Publications.

- Henderson, A. T., & Berla, N. (Eds.). (1994). *A new generation of evidence: The family is critical to student achievement*. Columbia, MD: National Committee for Citizens in Education.
- Ho, E. S., & Willms, J. D. (1996). Effects of parental involvement on eighth-grade achievement. *Sociology of education*, 69, 126-141.
- Holloway, S. (1986). The relationship of mothers' beliefs to children's mathematics achievement: Some effects of sex differences. *Merrill palmer quarterly*, 32, 231-250.
- Jimu, I. M. (2008). Community development: a cross-examination of theory and practice using experiences in rural Malawi. *Africa Development*, 33, 23-35.
- Johnson, D., Hayter, J. & Broadfoot, P. (2000). *The quality of learning and Teaching in Developing Countries: Assessing Literacy and Numeracy in Malawi and Srilanka*. London: DFID.
- Kazima, M., & Mussa, C. (2011). Equity and quality in mathematics education in Malawi schools. In B. Atweh, M. Graven. W. Secada, & P. Valero (Eds.), *Mapping Equity and Quality of Mathematics Education* (pp. 163- 176). Dordrecht: Springer.
- Keith, T. Z., Keith, P. B., Troutman, G. C, Bickley, P. G., Trivette, P. S., & Singh, K. (1993). Does parental involvement affect eighth-grade student achievement? *Structural analysis of national data. School Psychology Review*, 22, 474-496.
- Kendall, N. (2007). Parental and community participation in improving educational quality in Africa: current practices and future possibilities. *International Review of Education*, 53, 701-708.

- Kingdon GG, Little A, Aslam M, Rawal S, Moe T, Patrinos H, Beteille T, Banerji R, Parton B and Sharma SK (2014). *A rigorous review of the political economy of education systems in developing countries. (Final Report, Education Rigorous Literature Review)*. London: Department for International Development.
- Knapp, M. S. (1997). Between systemic reforms and the mathematics and science classroom: The dynamics of innovation, implementation, and professional learning. *Review of Educational Research*, 67, 227-266.
- Korkmaz, I. (2007). Teachers' opinions about the responsibilities of parents, schools, and teachers in enhancing student learning. *Education*, 127(3), 389-399.
- Krueger, R. A., & Casey, M. A. (2009). *Focus Groups: A Practical Guide for Applied Research (4th edition)* Thousand Oaks: SAGE Publications.
- Lee, S. (1994). Family-school connections and students' education: Continuity and change of family involvement from middle grades to high school. Unpublished doctoral dissertation, Johns Hopkins University: Baltimore.
- Lovell, C. H. (1992). *Breaking the cycle of poverty: The BRAC strategy*. West Hartford, Connecticut: Kumarian Press, Inc.
- Mansuri, G., Rao, V. (2004). Community-based and -driven development: a critical review. *The World Bank Research Observer*, 19, 1-39.
- Marshall & Rossman (1999). *Designing qualitative research (3rd ed.)*. London: SAGE Publications.
- Marshall, L. & Swan, P. (2010). Parents as participating partners. *APMC*, 15(3), 25-32.

- McNamara, O., Hustler, D., Stronach, I., Rodrigo, M., Beresford, E., & Botcherby, S. (2000). Room to manoeuvre: Mobilising the “active partner” in home-school relations. *British educational research journal*, 26(4), 473-489.
- Merttens, R. & Vass, J. (Eds.) (1993). *Partnerships in maths: Parents and schools in the IMPACT project*. London, UK: Falmer Press.
- Mfum-Mensah, O. (2004). Empowerment or impairment? Involving traditional communities in school management. *International review of education*, 6, 125-146.
- Mitchell, J. H., Hawkins, E. F., Jakwerth, P. M., Stancavage, F. B., & Dossey, J. A. (1999). *Student work and teacher practices in mathematics (NCES 1999-453)*. Washington, DC: U.S. Department of Education/National Center for Education Statistics.
- MoEST, (2004). *National strategy for community participation in primary school management: The move beyond bricks towards community involvement in whole school development*. Lilongwe: MoEST
- MoEST, (2006). *Malawi primary education curriculum and assessment framework, draft*. Lilongwe: Ministry of Education.
- Muir, T. (2009). At home with numeracy: Empowering parents to be active participants in their child’s numeracy development. In R. Hunter, B. Bicknell & T. Burgess (Eds.), *Crossing divides* (Proceedings of the 32nd annual conference of the Mathematics Education Research Group of Australasia, (pp. 395- 402). Wellington, NZ: MERGA.

- Muir, T. (2011). Join the club: Engaging parents in mathematics education. In J. Clark, B. Kissane, J. Mousley, T. Spencer, & S. Thornton (Eds.), *Mathematics: Traditions and [new] practices* (Proceedings of the 2011 AAMT-MERGA Conference (pp. 531-539). Alice Springs, NT: MERGA.
- Muir, T. (2013). *Numeracy at Home: Involving parents in Mathematics Education*. Wellington, NZ: University of Tasmania.
- Mullis, I. V. S., Martin, M. O., Foy, P., & Arora, A. (2012). *TIMSS 2011 international results in mathematics*. Chestnut Hill, MA: TIMSS & PIRLS Study Centre, Boston College.
- Mundy, K. (2008). "Civil society and its role in the achievement and governance of Education for All." Background paper prepared for the UNESCO *education for all global monitoring report 2009*.
<http://unesdoc.unesco.org/images/0017/001780/178020e.pdf> 7
- Nag, S, Chhat, S, Torgerson, C and M.J. Snowling (2014). Literacy, foundation learning and assessment in Developing Countries. *Final report. Education rigorous literature review. London: Department for International Development*.
- Narman, A. (1995). *Manual for Qualitative Research in Education*. DSE: Germany.
- NCES. (1999). *Highlights from TIMSS: Overview and key findings across grade levels*. Washington, DC: Office of educational research and improvement, U. S. Department of Education.
- NCTM. (1991). Professional standards for teaching mathematics. Reston, VA: NCTM.
- NCTM, (1989). *Curriculum and evaluation standards*. Reston, VA: NCTM.

NCTM, (2000). *Principles and standards for school mathematics*. Reston, VA: NCTM.

Neilson, HD (2007). Empowering communities for improved educational outcomes: Some evaluation findings from the World Bank. *Prospects*, 37(1), 81-93.

OECD (2006). Chapter 4: Parent and community voice in schools. *In demand sensitive schooling: Evidence and issues*.

<http://www.oecd.org/site/schoolingfortomorrowknowledgebase/themes/demand/parentandcommunityvoiceinschools.htm>

OECD. (2011). Building a high-quality teaching profession: Lessons from around the world. Paris: OECD, Center for Educational Research and Innovation.

Olsen, J., & Barrett, J. (2004). Coaching teachers to implement mathematics reform. *Mathematics teacher education & development*, 6, 73-91.

Onslow, B. (1992). Improving the attitude of students and parents through family involvement in mathematics. *Mathematics education research journal*, 4(3), 24-31.

Parsons, J. E., Adler, T., & Kaczala, C. M. (1982). Socialization of achievement attitudes and beliefs: *Parental influences*. *Child development*, 53, 310-321.

Peressini, D. (1998). The portrayal of parents in the school mathematics reform literature: Locating the context for parent involvement. *Journal for research in mathematics education*, 29, 555-582.

- Peressini, D. (1998). The portrayal of parents in the school mathematics reform literature: Locating the context for parental involvement. *Journal for research in mathematics education*, 29, 555-572.
- Pishghadam, R., & Shayesteh, S. (2012). Conceptions of assessment among Iranian EFL students. *Iranian EFL journal*, 8(3), 9-23.
- Pong, S. (1997, March). Other people's parents: The contextual impact of single-parenthood and social capital on tenth-grade achievement. *Paper presented at the annual meeting of the American educational research association, Chicago.*
- Prew, M. (2009). Community involvement in school development: modifying school improvement concepts to the needs of South African township schools. *Educational management administration leadership*, 37, 824-846.
- Price, J. (1996). President's report: Building bridges of mathematical understanding for all children. *The journal of research in mathematical education*, 27, 603-608.
- Pritchard, R. (2004). Investigating parental attitudes and beliefs in mathematics education. In T. Muir, (Eds.) *Numeracy at Home: Involving parents in Mathematics Education*, (pp. 1–13) Wellington, NZ: University of Tasmania.
- Purcell-Gates, V. (2000). Family literacy. In M. Kamil, P. Mosenthal, P. D. Pearson, & R. Barr (Eds.), *Handbook of reading research* 3, 853-870). Mahwah, NJ: Laurence Erlbaum Associates.

- Quintos, B., Bratton, J., & Civil, M. (Feb,17-21,2005).). *Engaging with parents on a critical dialogue about mathematics education*. Paper presented at the fourth congress of the European society for research in mathematics education, Sant Feliu de Guíxols, Spain.
- Ramsenger, J. (2004). *The concept of learner centred constructivist teaching and learning in primary schools and teacher training*. Berlin: Free University of Berlin, Centre for research in primary education.
- Rose, P. (2003a). *Communities, gender and education: evidence from sub-Saharan Africa*. Paris, UNESCO international institute for educational planning.
- Rose, P. (2003b). Community participation in school policy and practice in Malawi: balancing knowledge, national policies and international agency priorities. *Compare*, 33, 47-64.
- Sanchez, R. P., & Baquedano, M. M. (1993, April). Curriculum of the home and mathematics achievement. *Paper presented at the fifth annual international roundtable on families, communities, schools, and children's learning*. Atlanta
- Sanders, M. G. (1999). School membership in the national network of partnership schools: Progress, challenges and next steps. *The journal of educational research*, 92, 220-230..
- Save the Children (2013). The right to learn: Community participation in improving learning. *The_right_to_learn.pdf school level*. Canberra, ACT.
- Scribner, J. D., Young, M. D., & Pedroza, A. (1999). *Building collaborative relationships with parents*. In P. Reyes, J. D. Scribner, & A. Paredes (Eds.), *Lessons from*

high performing Hispanic schools: Creating learning communities (pp. 36-60). New York: Teachers College Press

Secada, W. G. (1992). *Race, ethnicity, social class, language, and achievement in mathematics*. In D. Grouws (Ed.), *Handbook of research on mathematics teaching and learning* (pp. 623-660). New York: Macmillan.

Shaeffer, S. (Ed.). (1992). *Collaborating for educational change: The role of teachers, parents and the community in School Improvement*. Paris: UNESCO, International Institute for Educational Planning.

Shaeffer, S. (Ed.). (1994). *Partnerships and participation in basic education: A series of training modules and case study abstracts for educational planners and managers*. Paris: UNESCO, International Institute for Educational Planning.

Shaver, A. V., & Walls, R. T. (1998). Effect of title 1 parent involvement on student reading and mathematics achievement. *Journal of Research and Development in Education*, 31, 90-97.

Simon, B. S. (2000). Predictors of high school and family partnerships and the influence of partnerships on student success. Unpublished doctoral dissertation. Department of Sociology, Johns Hopkins University, Baltimore.

Smith, E M., & Hausafus, C. O. (1998). Relationship of family support and ethnic minority students' achievement in science and mathematics. *Science Education*, 82, 111-125.

Smits, J., & Hosgor, A. G. (2006). Effects of family background characteristics on educational participation in Turkey. *International Journal of Educational Development* 26(5), 545-560.

- Starkey, P., & Klein, A., (2000). Fostering parental support for children's mathematical development: An intervention with Head Start families. *Early education and development*, 11, 659-680.
- Stephens, M., & Steinle, V. (2005). *Numeracy research and development initiative 2001-2004*. Canberra, ACT: Commonwealth of Australia.
- Stevenson, H. W, Lee, S., & Stigler, J. W (1986). Mathematics achievement of Chinese, Japanese, and American children. *Science*, 231, 693-699.
- Stodolsky, S. S., Salk, S., & Glaessner, B. (1991). Student views about learning math and social studies. *American educational research journal*, 28, 89-116.
- Tye, C. (1993). IMPACT and the early years classroom. In R. Merttens & J. Vass (Eds.), *Partnerships in maths: Parents and schools the IMPACT project*. London, UK: Falmer Press.
- Uemura, M. (1999). *Community participation in education: What do we know?* HDNED. World Bank.
- UNESCO (2014). *Achieving transparency in pro-poor education incentives*. International institute for educational planning: Paris, France.
- UNESCO. (2000). *EFA 2000 Assessment report: Malawi*. Lilongwe, Malawi: Ministry of education.
- UNESCO. (2008). *EFA global monitoring report 2008—Education for all by 2015: Will we make it?* UNESCO, Paris.

UNICEF. (2007). Education for some more than others. Geneva, Switzerland: UNICEF regional office for central and eastern Europe and the Commonwealth of independent states.

USAID, (2011). Community engagement in education programs. Accessed at http://www.equip123.net/docs/E1-FP_CommEng_Comp_Web.pdf

Uwezo at Twaweza. (2014). Are our children learning? Literacy and numeracy across East Africa. Nairobi, Kenya: Uwezo East Africa at Twaweza

Van de Walle, J. (1999). *Reform mathematics vs. the basics: Understanding the conflict and dealing with it*. Boston, MA: Pearson Education Inc.

Van de Walle, J. (2004). *Elementary and middle school mathematics* (5th ed.). Boston, MA: Pearson Education Inc.

Van Voorhis, F. L. (2001). Interactive science homework: An experiment in home and school connections. *NASSP Bulletin*, 85, 20-32.

Warren, E., & Young, J. (2002). Parent and school partnerships in supporting literacy and numeracy. *Asia-Pacific Journal of Teacher Education*, 30(3), 217-228.

Westat and Policy Studies Associates. (2001). The longitudinal evaluation of school change and performance in Title 1: Schools, (Vol I)(Executive summary). Washington, DC: WPSA.

World Bank. (1995b). Madagascar: *Towards a school- based strategy for improving primary and secondary education*. Washington, DC: World Bank.

APPENDICES

Appendix 1: Interview guide for Ministry of Education official

This document has been designed by Vincent Thauzeni who is a student at Chancellor College and is conducting research on “Community involvement in children’s numeracy skills development in Malawi.” This research is being carried out in partial fulfillment of Master of Education in Policy, Planning and Leadership. I am asking you to fill the document so that it helps in the attainment of information that will be helpful in the research. The researcher will respect your privacy whereby you will not be required to write your name or any other form of identification. Your views are strictly confidential. Your name will in no way be connected to the findings of this important study. Your cooperation will be greatly appreciated.

No	Question	Response
1.	First, I would want to know if the Ministry is aware of the existence of Numeracy Boost (NB) intervention in TA Chikowi, Zomba.	
2.	How was/is the Ministry involved in the NB’s key activities?	
3.	What is the Ministry’s view on the content, approaches and community involvement in mathematics camps?	
4.	Are mathematics camps making a contribution to the mathematics ability of learners?	

5.	What is the Ministry's stand on the use of communities to assist to children learn mathematics?	
6.	Are there any plans for the Ministry to sustain the camps, should the intervention phases out?	
7.	Any other comment on the use of communities?	

Thank you very much for sparing your time to respond to this questionnaire. God bless.

Appendix 2: Interview guide for senior official from Save the Children country office

This document has been designed by Vincent Thauzeni who is a student at Chancellor College and is conducting research on “Community involvement in children’s numeracy skills development in Malawi.” This research is being carried out in partial fulfillment of Master of Education in Policy, Planning and Leadership. I am asking you to fill the document so that it helps in the attainment of information that will be helpful in the research. The researcher will respect your privacy whereby you will not be required to write your name or any other form of identification. Your views are strictly confidential. Your name will in no way be connected to the findings of this important study. Your cooperation will be greatly appreciated.

No	Question	Response
1.	First, I would want to know why Save the Children thought of introducing Numeracy Boost (NB) intervention in TA Chikowi, Zomba.	
2.	What does it take for an organisation to introduce an intervention like NB in a country?	
3.	How was / is the Ministry of education involved in the implementation of NB?	
4.	Why did you think of involving communities in the activities of NB?	
5.	What challenges have you registered in using communities to	

	implement such interventions as NB?	
6.	What evidence is there to prove that mathematics camps are making a difference in the education of learners?	
7.	How is the organisation preparing the communities so that they continue with NB activities when the intervention phases out?	
8.	Any word to stakeholders?	

Thank you very much for sparing your time to respond to this questionnaire. God bless.

Appendix 3: Interview guide for Zomba District Education official

This document has been designed by Vincent Thauzeni who is a student at Chancellor College and is conducting research on “Community involvement in children’s numeracy skills development in Malawi.” This research is being carried out in partial fulfillment of Master of Education in Policy, Planning and Leadership. I am asking you to fill the document so that it helps in the attainment of information that will be helpful in the research. The researcher will respect your privacy whereby you will not be required to write your name or any other form of identification. Your views are strictly confidential. Your name will in no way be connected to the findings of this important study. Your cooperation will be greatly appreciated.

No	Question	Response
1.	First, I would want to know if the Ministry is aware of the existence of Numeracy Boost (NB) intervention in TA Chikowi, Zomba.	
2.	How many mathematics camps have been established so far which support the learning of mathematics by children?	
3.	Who is charged with the responsibility of running these camps? What support do you give them?	
4.	What factors motivated communities to accept helping their own children?	
5.	How often do you monitor what goes on in these camps to	

	make sure they align with what is in school?	
6.	Are the camps making any difference in the learning of mathematics at school?	
7.	What challenges are there which affect the smooth running of these camps?	
8.	What are you doing to make sure that these camps are retained should the intervention phases out?	
9.	Any other comment on the use of communities?	

Thank you very much for sparing your time to respond to this questionnaire. God bless.

Appendix 4: Interview guide for Save the Children official, Zomba office

This document has been designed by Vincent Thauzeni who is a student at Chancellor College and is conducting research on “Community involvement in children’s numeracy skills development in Malawi.” This research is being carried out in partial fulfillment of Master of Education in Policy, Planning and Leadership. I am asking you to fill the document so that it helps in the attainment of information that will be helpful in the research. The researcher will respect your privacy whereby you will not be required to write your name or any other form of identification. Your views are strictly confidential. Your name will in no way be connected to the findings of this important study. Your cooperation will be greatly appreciated.

No	Question	Response
1.	First, I would want you to give a brief overview on the introduction of Numeracy Boost (NB) intervention in TA Chikowi, Zomba.	
2.	Why did you think of using the community to assist in its implementation?	
3.	What contribution is the community making in order to achieve the goals of the intervention?	
4.	What are the motivating factors for communities to take the leading role in the implementation of this intervention?	
5.	What role do you play to assist communities run mathematics camps?	
6.	What challenges are encountered as you roll out this	

	intervention?	
7.	Are there any plans for the community to sustain the mathematics camps, should the intervention phases out?	
7.	Any other comment on the use of communities?	

Thank you very much for sparing your time to respond to this questionnaire. God bless.

Appendix 5: The PEA's or Head teacher's questionnaire

This document has been designed by Vincent Thauzeni who is a student at Chancellor College and is conducting research on “Community involvement in children’s numeracy skills development in Malawi.” This research is being carried out in partial fulfillment of Master of Education in Policy, Planning and Leadership. I am asking you to fill the document so that it helps in the attainment of information that will be helpful in the research. The researcher will respect your privacy whereby you will not be required to write your name or any other form of identification. Your views are strictly confidential. Your name will in no way be connected to the findings of this important study. Your cooperation will be greatly appreciated.

No	Question	Response
1.	When did Numeracy Boost (NB) intervention start being implemented in your schools or zone?	
2.	Which classes are targeted? How many learners and teachers are involved?	
3.	What are the teachers’ view on the content, approaches and community involvement in mathematics camps?	
4.	Are mathematics camps making a contribution to the mathematics ability of learners? How have learners responded to this intervention?	
5.	What challenges are there as you get involved in the implementation of NB activities?	

6.	What are the communities' attitudes toward this intervention?	
7.	In what ways is the intervention sustainable without external support?	
8.	Any other comment on how best the intervention can be done to profit many learners?	

Thank you very much for sparing your time to respond to this questionnaire. God bless.

Appendix 6: Teachers' interview guide

My name is I welcome you to this interview. Feel free. I am conducting a research on “Community Involvement in children’s numeracy development in Malawi.” This research is being conducted in partial fulfillment of Master of Education in Policy, Planning and Leadership. I will be asking you questions on the topic, wherever you don’t understand, do not hesitate to ask me for clarification. Your name will in no way be connected with the findings of this research. Once again feel free to contribute, for your ideas will be of great help.

1. What class do you teach and for how long have you been teaching in this class?
2. Which other classes have you been teaching?
3. Numeracy Boost is being implemented in your classrooms, how do you feel?
4. Are the mathematics camps making any difference in the children you teach?
5. What should be done to make mathematics camps of great importance to children in schools?
6. What should be done to make mathematics camps continue even without any external support?
7. Any other comments on the functionality of camps to enhance learning in schools?

Thank you very much for your precious time. God bless you.

Appendix 7: Camp Facilitator Checklist

Part 1: School details

School code: Camp code: Date:

Enrolment: Boys: Girls: Total:

Attendance: Boys: Girls: Total:

Part 2: Camp leader skills

No	Funso	Yankho
1.	Kodi ntchito yophunzitsa kutsimba mudayamba liti?	
2.	Chidakupangitsani ndi chiyani kuti mudzipereke pantchitoyi?	
3.	Bungwe la SAVE limakuthandizani bwanji pantchitoyi?	
4.	Mwachitapo maphunziro angati okhudza ntchitoyi?	
5.	Makolo ndi mafumu amakuthandizani bwanji pantchitoyi?	
6.	Ndimavuto oti amene mumakumana nawo pantchitoyi?	
7.	Kuti mudziyimire panokha pantchitoyi ndi ziti zikufunika?	
8	Muli ndi mawu ena owonjezera?	

Gawo 3: Supplementary materials and community participation

No	Funso	Yankho
1.	Kodi muli ndi zipangizo zokwanira zogwirira ntchitoyi?	
2.	Kodi zipangizo zimenezi mumazipeza bwanji?	

3.	Kodi patsimba ndipotasuka ndi paukhondo?	
4.	Kodi madzi, zimbudzi ndi zina zoseweretsa zilipo patsimba?	
5.	Mafumu ndi makolo amakuthandizani bwanji?	
6.	Kodi mumasamala bwanji zipangizo za patsimba?	
7.	Kuti zimene mukuchitazi zidzapitirire zikufunika ndi ziti?	
8.	Muli ndi mawu ena owonjezera?	

Gawo 4: Children enjoyment and participation

No	Funso	Yankho
1.	Kodi ana amabwera mochuluka bwanji kutsimba?	
2.	Chomwe chimapangitsa ana kuti azibwera motere nchani?	
3.	Ana amabwera kangati kutsimba pasabata imodzi?	
4.	Phunziro lakutsimba limatenga nthawi yochuluka bwanji?	
5.	Ndi ana amakalasi oti amene amabwera kutsimba?	
6.	Mafumu ndi makolo amathandiza bwanji za ana kustimba?	
7.	Kuti matsimba ana adzawakonde mpaka mtsogolo tingatani?	
8.	Muli ndi mawu ena owonjezera?	

Appendix 8: Mathematics Camp Observation and Evaluation Form

Supervisor's Code: Village Code: School Code:

Facilitator Code: Camp session: Date:

Key: Excellent – 4; Good – 3; Average – 2; Needs Support – 1

Component	Items	4	3	2	1
Facilitator knowledge, attitude and practice	Used guide book to read the session				
	Prepared materials for sessions before hand				
	Was confident in teaching the subject matter and explained the concepts well				
	Interacted well with learners				
	Was able to answer learners' questions				
	Used materials from mathematics tool kit during session				
Children experience	Learners were interested and actively engaged				
	Learners asked questions				
	Learners seemed to enjoy the session				
	Learners worked together either in pairs or groups				
Materials set up and space	Adequate, safe and comfortable space				
	Materials were available during the session				
	Learners using materials during activity time				
	Overall Grade				

Action items for follow-ups					
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Appendix 9: Interview Guide for Parents and Traditional Leaders

Dzina langa ndine Takulandirani kumsonkhano uno omwe cholinga chake ndikufuna kudziwa mmene mukugwirira ntchito yanu yolimbikitsa ana pamaphunziro a masamu. Choncho khalani omasuka pazokambiranazi zomwe zithandize bungwe la SAVE kudziwa zina ndi zina makamaka mavuto amene mukukumana nawo kuti potero tithandizane nawo mmene tingawathetsere ndi kupitiriza kupititsa patsogolo maphunziro a ana athu. Ndidzakufunsani mafunso kuti mundiyanke, ndipo khalani omasuka kufunsa pomwe simunamvetse. Khalani omasuka chifukwa pano sititengana mayina ndipo maganizo anu sadztuluka ngati anuanu koma a gulu basi. Tiyeni tiyambepo ndipo maganizo anu ndi ofunika kwambiri pamsonkhano uno.

1. Mudayamba liti kuthandiza ana anu paphunziro lamasamu?
2. Ndi chani chimene chidakulimbikitsani kuti mutenge nawo gawo pamaphunziro amasamuwa?
3. Ndi zinthu ziti zomwe mumachita pofuna kuthandiza ana anu kutsimba ndi panyumba pomwe?
4. Ndi mavuto oti amene mumakumana nawo pamene mukulimbikitsa kuthandiza ana anu paphunziro la masamuwa?
5. Dongosolo lanu ndi lotani pofuna kuti mudzapitirize ntchitoyi ngakhale mabungwe ataleka kutithandiza?
6. Kutu matsimba athu aziyenda bwino pakufunika zinthu ziti?
7. Mau anu otsiriza ndi otani ku anthu osiyanasiyana

Zikomo kwambiri,msonkhano wathu wathera pamenepa.