

UNIVERSITY OF RWANDA



**AN IMPACT EVALUATION OF EARLY CHILDHOOD DEVELOPMENT CENTRES IN RWANDA
(A CASE STUDY OF HUYE DISTRICT, SOUTHERN PROVINCE)**

JUNE 2019 – OCTOBER 2019

BY

AYENI SOLOMON AYODELE

REG NUMBER: 218014090

**THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
AWARD OF THE DEGREE OF MASTERS OF ARTS IN DEVELOPMENT STUDIES
COLLEGE OF ARTS AND SOCIAL SCIENCES
SCHOOL OF GOVERNANCE
UNIVERSITY OF RWANDA**

ADVISOR: PROFESSOR MASENGESHO KAMUZINZI

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MASTERS OF ARTS IN DEVELOPMENT STUDIES

DECLARATION

This research study is an original work and has not been presented to any other University or College for a Diploma or Degree. Sources of information other than my own have been acknowledged and a reference list has been appended.

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This research study has been submitted with my approval as the University Research Advisor.

SIGNATURE:

DATE:

Prof. Masengesho Kamuzinzi

University of Rwanda

DEDICATION

I dedicate this thesis to the children at the ECD centers across Huye District (particularly Maraba Sector) in the Southern Province of Rwanda who were bright and eager sponges to all of their experiences. Thank you for your innocence, honesty, and contagious laughter. You all are an inspiration to ensure we care for our young ones today to create a better tomorrow.

ACKNOWLEDGMENT

This has been an exciting journey and I would like to thank my research advisor Professor. Masengesho Kamuzinzi for his guidance and support throughout the course of this research; and Prof. Ismael Buchanan, the earlier encounter with you at the start of my program made a big difference. I would like to thank all my lecturers for their guidance through all the courses, for believing in my class, understanding our passions, and encouraging us to keep asking questions! I would like to further thank the departmental secretary, Twizere Chantal for her kind support and assistance towards me as an international student. You all challenged me to become a better student beyond my own expectations. Thanks to the University of Rwanda Development Studies Department for providing me with one of the most valuable experiences that a postgraduate student could have.

I would like to extend a great deal of gratitude to the executive secretary of Maraba Sector in Huye district, staff of the ECD centers I visited, parents, and children at the centers as well. I would like to thank all the families who participated in the study for their willingness and immense support for the success of the research work. My sincere appreciation also goes to the leadership of UNICEF Rwanda for the opportunity to volunteer and subsequently intern. The invaluable experience from the Communication, Advocacy, and Partnership (CAP) section where I served cannot be quantified. My deepest gratitude goes to Rajat (Chief of CAP), Justin, and Veronica for the guidance, tutelage and wonderful hands-on experience.

Special thanks go to my cohort. We began the program together with the vigor to become a catalyst for change and development in Africa. We became each other's home away from home, family away from family, and a motivating force in surviving postgraduate school. Thank you all for making my time at the University of Rwanda a great experience.

I would like to thank my family and friends for their encouragement and support. Thanks to my mum and siblings for their prayers and for inspiring me to not relent. And very specially, a very big thank you to my beautiful wife Emiola and lovely son Oluwashindara. Your unyielding love kept me going to turn my dreams into reality.

And above all, all praise to God, for with God nothing is impossible!

ABSTRACT

The Convention on the Rights of the Child (CRC) clearly spells out the significance of early child development (ECD). Its document shows that a child has a right to develop to “the maximum extent possible” (Article 6), and that “State parties recognize the right of every child...” (Article 27). This is an affirmation that the right to a child’s development has been accepted and embraced by the international community.

Through a descriptive comparative study, and by randomized control trial, the researcher investigates if ECD centers in Maraba Sector of Huye District in Rwanda as an intervention have high quality, acceptable or poor impact in terms of performance on the children and the community as a whole by looking at the program popularity, enrolments, learning approach and other selected factors. Data was collected from from 127 participants’ representatives of the 6 Cells in the Sector where 65 were composed of the experimental group and 62 comprised the control group. Survey Questionnaire and Observation were the primary methods employed to collect the data. The quantitative data have been analyzed by adapting the techniques employed by Al Rubaish (2010) in the analysis of SES in addition to other excel operations and use of cumulative percentage; whereas the qualitative data were analyzed along with the quantitative results.

The study found noteworthy popularity of the intervention above 98% with the experimental group. 97% of the beneficiaries agreed that the ECD program adequately prepares the child for primary education. 95% agree that the programs helped parents on parenting abilities and development of the child. It showed school feeding program, free tuition, and a clean, safe and secure environment contribute immensely as motivations for parents to enroll their children. The results of the learning approach showed high quality in relation to the curriculum, delivery, and cognitive development. The study recommends amongst others caregivers compensation, school feeding program and free tuition to be maintained.

Key Terms: Early Childhood Development, Popularity of Intervention, School Feeding Program, Learning Approach, Cognitive Development, School Readiness, Experimental Group, Control Group, Caregivers, ECD Policy, Key Evaluation Question

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LIST OF ABBREVIATIONS AND ACRONYMS

CRC	Convention on Rights of the Child
ECD	Early Childhood Development
ITT	Intention-to-treat
KEQ	Key Evaluation Question
MIGEPROF	Ministry of Gender and Family Protection
MM	Mixed method
MSC	Most Significant Change
NECDP	National Early Childhood Development Program
PIES	Program Impact Evaluation Survey
QUAL	Quality
QUANT	Quantity
QuIP	Quality Impact Assessment Protocol
RCT	Randomized Control Trials
RDD	Regression Discontinuity Design
RQ	Research Question
SCM	Success Case Method
TBIE	Theory-based Impact Evaluation
TOT	Treatment-on-the-treated
UNDHR	United Nation Declaration on Human Rights

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Over 200 Million children from least developed and developing countries in Africa under the age of five are often at risk of falling behind from reaching their optimum development potential as a result of poor nutrition, poverty and poor learning facilities (Lancet, 2007). According to a UNICEF (2019) global report on pre-primary education, half of the world's children ages within the pre-school age don't have access to early childhood education during this vital period of their lives. The report further showed that about 8 in 10 children (78%) are missing out on this opportunity. This reality is a huge challenge for future educational development. Currently, researchers in Early Childhood Development (ECD) are proving with scientific evidence the determining influence of early development on the chances of success later in life.

For the sake of clarification and for the purpose of this research work, it is important to note that the terms early childhood development, early childhood education, early childhood care, and preschool education are used interchangeably. In any of the context in this study, the research refers to developmental and scholastic efforts for children from ages 1months to 72months or 6 years which is targeted at nurturing their social, motivational, emotional and cognitive development so as to provide them with a solid foundation for formal primary education.

The Convention on the Rights of the Child (CRC, 1989) clearly spells out the significance of early child development. The document shows that a child has a right to develop to “the maximum extent possible.” (Article 6) and that “States Parties recognize the right of every child to a standard of living adequate for the child's physical, mental, spiritual, moral and social development” (Article 27). This is an affirmation that the right to a child's development has been accepted and embraced by the international community.

The National Early Childhood Development Program (NECDP) in Rwanda has the mandate to manage all ECD program implementation in the country with a covering from the Ministry

of Gender and Family Promotion (MIGEPROF). The current ECD Policy (Uburere buruta ubuvuke) was produced in 2016 under the MIGEPROF, and it is in consonance with the vision of the Government of Rwanda towards the transformation of the economy into a knowledge-based economy. The notion is the improvement of human skills and knowledge development especially for the young generation through ECD interventions. The first ECD policy was adopted by the government in September 2011 and it went through several reviews before the existing one so as to accommodate identified constraints. The revised document involves a framework through which government and stakeholder interventions are well-defined and through which the government commits to continuous engagement with stakeholders. It also contained mechanisms to remedy some of the identified gaps from previous ECD policies.

The core mission of the ECD policy lay emphasis on the provision of quality interventions to enhance the development of Rwandan children up to 6 years old. This supports the ultimate vision of providing children with learning opportunities that will cater for their comprehensive development and with the participation of the communities as well. Its general objectives highlight equity, access, and quality of ECD services.

The Rwanda ECD policy by Ministry of Gender and Family Promotion (2016) maintains a Strategic Implementation Plan which includes five special areas of focus and with implementation from 2016 to 2021:

- Parenting Education and Support
- School Readiness and Transition
- Child Protection and Family Promotion
- Health, Nutrition, and WASH
- Coordination, Governance, resourcing, Monitoring, and Evaluation

Based on Rwanda's national Integrated Child Rights Policy (ICRP, 2011-2016) with its corresponding Child Care Reform Strategy (CCRS, 2012), early child development is increasingly being put on the agenda for children's rights. Ensuring the healthy cognitive, social and emotional development of young children merits the highest priority of every responsible government, organization, community, family, and individual for the sake of

raising healthy children in the country. Reaching children in a holistic manner and incorporating health, nutrition, water and sanitation, education and interventions that support their full development is crucial (ncc.gov.rw)

In response to the Education for All (EFA) action plan challenges, the Education Sector Policy set as its primary objective the assurance that education is available and accessible to all Rwandans, including pre-primary aged children (Rwanda Ministry of Education, 2003). Moreso, in line with EFA framework, through the Education Sector Strategic Plan (ESSP) 2005-2010, the Ministry of Education identified nine objectives for the implementation of the Nine Year Basic Education Program; the first objective was to extend the provision of early childhood care and development (Rwanda Ministry of Education, 2005).

This study seeks to assess the impact of Early Childhood Development (ECD) centers in Rwanda with particular attention to Huye District in the Southern Province of Rwanda as a case study. The research will look at the efforts of the Government of Rwanda and its partners in the provision of ECD centers in the district, measure the extent of the impacts the ECD centers have had on the direct and indirect beneficiaries, and also come up with relevant recommendations as to gaps identified in the process of the research.

1.2 Problem Statement

ECD focuses on the first years of a child through an all-inclusive provision of child protection, healthy nutrition, proper hygiene and early learning. The first 1,000 days from conception to age two are increasingly being recognized as very important to the development of neural pathways that lead to linguistic, cognitive and socio-emotional capacities that are also predictors of labor market outcomes later in life (Atinc & Gustafsson-Wright, 2013). Cognitive development in a child is essential and also serves as a significant factor in the welfare of the child (Case and Paxson, 2008).

According to the general objective of the revised National Early Childhood Development Program, as managed by the Ministry of Gender and Family Promotion (MIGEPROF), the

program policy seeks to ensure improved quality and access to ECD services by all the intended beneficiaries in a clear coordinated and sustainable manner (Ministry of Gender and Family Promotion, 2016). This is also reflected in the Economic Development and Poverty Reduction Strategy (EDPRS, 2010) II of the government development agenda. The NISR (2012) estimated 15% of the total child population of 5 million as potential ECD services beneficiaries. And one of the NECDP's desired goal is to provide model ECD centers in each of the 14,837 villages in Rwanda to cater for the children.

However, the reality is that majority of the pre-primary schools are found in cities and other urban areas. According to the Ministry of Education (MINEDUC, 2014), even though pre-primary education enrolment rate including ECD centers increased from around 6% to about 13% from 2010 to 2014 respectively, the Education Sector Strategic Plan (ESSP) target of 17% as at that period was not achieved. This shortfall also impacted negatively the targeted 2018 33% pre-primary school Gross Enrolment Rate (GER) (MINEDUC, 2017). Also, the current number of preschool or centers available nationwide and providing ECD services is still a far cry from the original ambition of 1 preschool per Cell (i.e. 2,148 total) by 2017 or 1 model ECD center per village. Apart from the inadequacy of the number of ECD centers, the challenge of the quality of services provided is also a fundamental issue. Inadequate funding, limited professional caregivers, access to remote communities, minimal community participation and poverty are some of the other challenges that pose substantial threats to the availability of ECD facilities in Rwanda. All of these limit the opportunity of an all-inclusive development for the child.

In response to these shortcomings, this study proposes to investigate several options for making ECD centers more effective and efficient especially with respect to the provision of services that enhances the holistic development of the child. The researcher plan to carry out a comparative study of the impact evaluation of ECD centers in Maraba sector of Huye District in order mitigate some of the identified gaps in service provision with respect to the popularity of the program, accessibility, learning approach, impact on parenting and childcare, and scale-up of intervention.

1.3 Research Objectives

The overall objective of the research work is to evaluate the impact of ECD centers in Rwanda considering the efforts of the Government of Rwanda in collaboration with other relevant stakeholders by answering questions of whether the program is working or not, and hence assist with recommendations of scaling-up where necessary.

More specifically the study aims to:

- Examine popularity or acceptance of the ECD centers in host communities
- Assess the level of enrollment by children
- Evaluate the approaches towards learning and cognitive development
- Ascertain graduation/transition rate into elementary school
- Determine the impact on parenting and childcare
- Provide mechanisms or strategies for scale-up of ECD programs, improve designs, and advance the centers for further progressive impact

By providing feedback to help improve the design of programs and policies, the result of this study will be valuable to the ECD strategic plan of the Government of Rwanda as well as related agencies like the National Early Childhood Development Program (NECDP) which has oversight responsibilities on ECD Programs in Rwanda.

1.4 Research Questions

The following are research questions (RQs) or Key Evaluation Questions (KEQs) the study attempts to answer:

1. How popular are the ECD centers within their host communities?
2. What are the factors that determine the enrollment of children at the ECD centers?
3. Does the learning approach at the centers have a significant impact on program quality outcomes and cognitive development?
4. Do the ECD centers improve elementary school readiness upon entry into grade P1?

5. Are there significant changes in parenting practices and time spent with children in educational activities?
6. How can the ECD programs/centers scale-up for continuous impact in the host communities?

1.5 Justification for the research work

The research will focus on the efforts of the Government of Rwanda and relevant partners in the establishment of ECD centers across Huye District and specifically in Maraba Sector. The research will seek to determine the level of impact (if any) of the ECD centers with respect to the popularity of the program, enrollment of children from the communities, learning approaches in relation to cognitive development, school readiness, and graduation rate, and also indicate if there are any reasonable impact on parenting practices. In the end, the researcher hopes to come up with practical, relevant and executable strategies for the scale-up of existing services of the centers.

In Rwanda, there is currently a considerable amount of challenges facing attention to early childhood development, education and care especially from a standpoint of the government policy in its National Early Childhood Development Policy Strategic Plan (2016-2021). The strategic plan was introduced to address current and expected challenges in ECD whilst providing interventions that will make children healthy, well developed and adaptable socially, emotionally balanced, and in the long run productive citizens. These problems and inadequacies call for a pragmatic approach so as to obtain progressive results from the policies and strategic plans on ECD.

This research seeks to draw attention to identified gaps within the more specific objectives and also provide room for careful consideration of what implementation of programs at the ECD centers actually looks like in practice. In addition, the research will come up with practical sustainable strategies to fill some of the identified gaps and observed challenges.

The end-result the researcher strongly believes will also serve as an opportunity to consider other progressive approaches to scale-up service provisions at the ECD centers.

1.6 Significance of the Study

The provision of ECD services in Rwanda is not a new occurrence as the program has been operational since 2011 when the first policy on ECD was approved by the country's cabinet (NECD Policy Strategic Plan, 2016). The implementation of the current ECD program over the next 5 years (2016/2021) under the revised ECD policy strategic plan has five focus areas: i) Parenting Education and Support, ii) School Readiness and Transition, iii) Child Protection and Family Support, iv) Coordination, Governance and Resourcing, and v) Monitoring and Evaluation (Ministry of Gender and Family Promotion, 2016)

In correlation with the fifth focus area of monitoring and evaluation from the thematic area, this study underpins the importance of evaluating the impact of Center-Based ECDs and their activities on the development of the child. The fundamental idea here is that the study will shed light on identified gaps in the program but also proffer recommendations through its findings that will be beneficial to the implementation of the program, all stakeholders, and the development of Rwandan children.

1.7 Scope of the Study

Children between the ages of 0 and 6 may seem like they are just beginning life's journey. The fact is that more than 85% of their brain development is already nearly in place. These early years provide a critical window of opportunity for children in order to help them build a strong foundation of learning and develop skills that can help them succeed in school and through the course of their lives.

The research covers the impact of Center-Based ECD with particular attention on the development of the child. The study conducted from June 2019 to October 2019 takes the case of Huye district (specifically Maraba Sector) in the Southern Province of Rwanda. A point to note here is that even though there are a few Community-Based or Home-Based

centers, they are “improvised centers” usually organized by interested members of the community. Temporary structures or selected homes are turned into learning areas for young children from 3 to 6 years. These improvised centers are not of high priority in this study.

1.8 Limitations of the Study

Out of the 30 districts in Rwanda, the study was conducted with the consideration of only 1 district as a case, and only 1 sector from the district. Though the district has 14 sectors that were all taken into the sample consideration, the use of one case study may limit the ability to generalize the result of the findings.

Second, the study did not take into consideration the activities of a community or home-based centers. These centers may not have the standard to provide quality ECD services like the Center-based ECD, however, they still contribute in a minimal way to ECD.

Also, the challenge of assessing relevant literature on the subject matter also posed a bit of problem as very few books and literature are currently available on impact evaluation of ECD centers or related studies.

Lastly, there are some reservations about the reliability of data collected from some of the respondents as the researcher believes to the extent that some of the responses given were provided based on sentiments. Though the researcher tried as much to educate respondents on the essence of the research, this wouldn't have stopped respondents from reacting to sentiments in their responses.

1.9 Organization of the Study

The study is organized in five chapters. Chapter One consists of the background of the study, statement of the problem, objectives of the study, research questions, significance of the study, limitations, and organization of the study. Chapter Two contains the theoretical framework and review of literature which is a critical appraisal into the works of previous researchers who have made studies in the same area and summary of the study. Chapter Three is the research methodology containing a description of the study area, population and

sample, data collection procedures and tools, and techniques of data analysis and interpretation. In Chapter four the data collected is presented, analyzed and results of the findings discussed. Finally, Chapter Five presents conclusions and recommendations of the study.

CHAPTER TWO

THEORETICAL FRAMEWORK AND REVIEW OF LITERATURE

The researcher discusses the concepts of impact evaluation and early childhood development. Particular attention is given to the approaches of impact evaluation and several works of literature are also reviewed on early childhood development and on impact evaluation of ECD.

2.1 Definition of Concepts

2.1.1 Impact Evaluation

Impacts can be described as the long term results of a program, project or policy, usually in conjunction with other factors and activities by other agencies. They include intended and unintended results, positive and negative, direct and indirect impacts (Rogers P., Hawkins A., McDonald B., Macfarlan A., & Milne C., 2015). The Commonwealth of Australia's Resource Management Guide No. 131 (2015, p. 49) defines impact as:

“The ultimate difference made by fulfilling a purpose defined in an entity's corporate plan. Compared to the combined outcome of activities contributing to a purpose, impacts are measured over the longer term and in a broader societal context.”

The OECD Development Assistance Committee further emphasized that impacts the positive and negative, intended and unintended, direct and indirect, primary and secondary effects produced by an intervention.

According to the United Nations Evaluation Group guidance document (UNEG, 2013) attempts to establish one universally agreed definition of impact evaluation has not been productive. This is because different, but overlapping elements of such evaluations have been emphasized by various stakeholders. Furthermore, methodological discussions around impact evaluation have raised fundamental and sensitive issues of the relationship between qualitative and quantitative methods in the social sciences, which cannot be resolved in the evaluation arena.

In a more general sense, impact evaluation may be described as a research process whereby a researcher conducts a study to determine the effect of a particular intervention. The essence is to help determine if the intervention has made any measurable success in some way which may then provide the opportunity for expansion. The World Bank definition of impact evaluation hinges on two main emphases. First, it is conducted to assess changes in the well-being of individuals, communities or firms that can be attributed to a particular project, program or policy. And second, it provides feedback to help improve the design of programs and policies.

In carrying out impact evaluation, it also seeks to determine the longer-term results that are generated by policy decisions, often through interventions, projects or Programs. Impacts may be positive or negative, intended or unintended, direct or indirect (Rogers et. al, 2015). According to Baker (2000) evaluation is an assessment of how the intervention being evaluated affects outcomes, whether these effects are intended or unintended. The proper analysis of impact requires a counterfactual of what those outcomes would have been in the absence of the intervention.

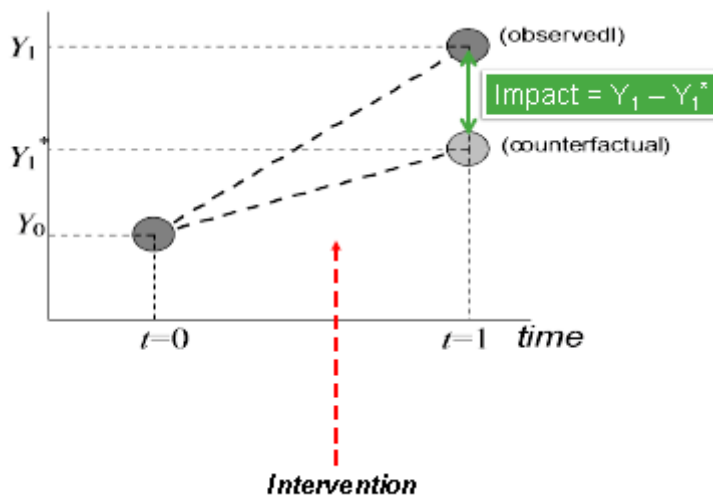
The design of an impact evaluation procedure is quite important as it will help to answer the question of whether a particular program is working or not, and providing the ground for a

decision regarding scaling up. A good design Impact evaluation serves both objectives of evaluation: lesson-learning and accountability (OECD, 2001). Impact evaluation often involves a mixed-method i.e contextual and qualitative analysis. The main purpose is to improve evidence-based policymaking by means of providing effectiveness evaluations of interventions.

2.1.2 The Counterfactual

More recently, several arguments have supported the inclusion of counterfactuals in impact evaluations. The counterfactual in impact evaluation is a method of comparison where the outcomes of interest of those having benefitted from a policy or program (the “treated group”) with those of a group similar in all respects to the treatment group (the “comparison/control group”), the only difference being that the comparison/control group has not been exposed to the policy or program. The comparison group provides information on “what would have happened to the members subject to the intervention had they not been exposed to it”, the counterfactual case.

Fig. 1: The Counterfactual case



Source: IHME Impact Evaluation and Study designs to Measure Effectiveness (Ng. 2013)

The case for counterfactual impact evaluation is based on the need to collect evidence and

determine whether policy objectives have been met and, ultimately, whether the resources were used efficiently. This generates feedback into the design and implementation of future interventions and budgetary decisions. In light of this, the European Commission is committed to making impact evaluation part of a policy implementation life-cycle (EU Science Hub).

Although measurement of outcomes is a major issue in evaluation, the counterfactual does not appear often in the evaluation literature. In the evaluation field, Mohr (1995) points out that the use of the counterfactual is essential in impact evaluation, as it provides the alternative against which the program's impact can be measured. The counterfactual is particularly relevant when the outcomes for a program are expressed in terms of change.

2.1.3 Early Childhood Development (ECD)

Early childhood is the period when a human develops the fastest. This period of development is very fundamental to a complete and healthy cognitive, emotional and physical growth of a child. Evidence from science has proven that if the brain does not receive the essential stimulation during this critical period, it then becomes quite challenging for the brain to rewire itself at a later time (Shonkoff, J.P & Phillips, D.A (Eds), 2000)

Early Childhood Development popularly known as ECD refers to an all-inclusive approach to policies and programs for children from 0 – 6 years of age, parents, and caregivers. The approach promotes and protects the rights of the young child to survival, growth, and development. Experiences from ECD Programs around the world demonstrate the promise for children's well-being and for that of their families and communities (UNICEF, 2001). During this period, when brain development is most active, lifetime behavior patterns are formed. Therefore it is pertinent to take cognizance of what happens or does not happen at these early years of a child's life. The activities the children involved in during their early years do have an impact on their growth, development outcome and also opportunities as they grow up.

It is well established that disadvantaged children, especially those children living in poverty experience greater levels of environmental and psychosocial stressors than their higher-income counterparts (Crockett & Haushofer, 2014). The experiences they have could highly place them in a position where their physical development and mental capacity are hampered as they grow up (Shonloff et al, 2012). A child's early development plays a vital part in subsequent school performance, health, socialization, and future livelihood. For children born into and affected by poverty, the opportunities that interventions in early childhood provide hold the promise of overcoming social disadvantages and breaking the intergenerational transmission of poverty.

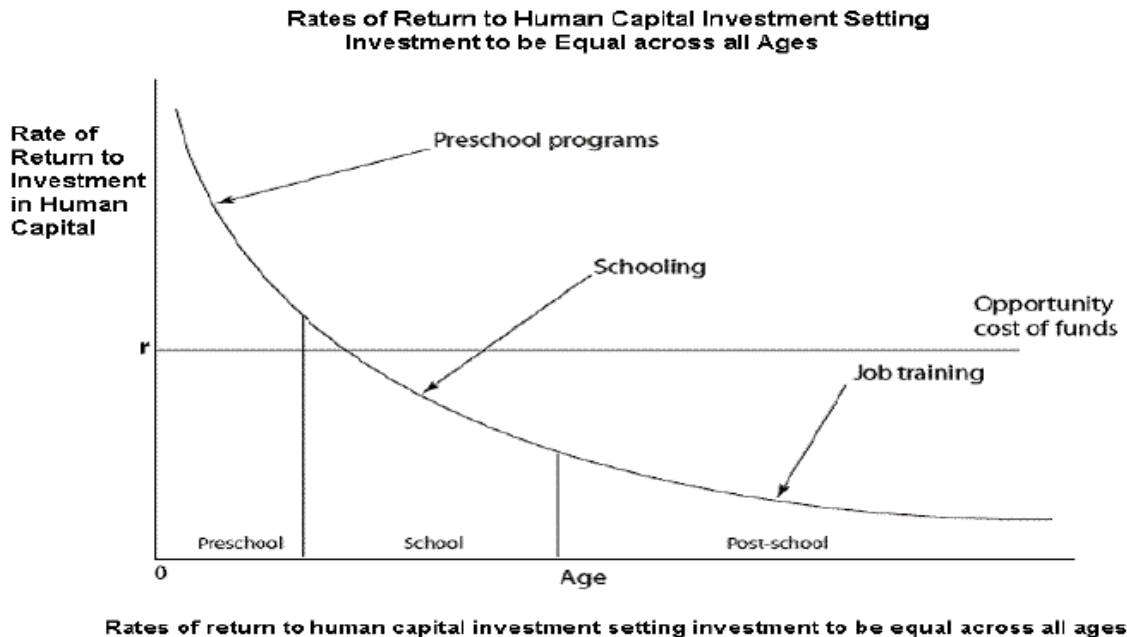
Why invest in ECD?

It is quite obvious especially from several types of research that early childhood is a very important period where rapid transformation in cognitive, physical, emotional and language development takes place in a child. This period provides an opportunity for a person's lifetime development (UNESCO, 2010). It lays the foundation for lifelong learning where skills and attitudes are acquired and lay the foundation for lifelong learning (Cunha F., Heckman J.J, Lochner L., & Masterov D.V, 2006). At this stage of a child's life, the development of the brain is faster than any other stage in life (Woldehanna, 2011). Halfon et al (2001) explained that by age two, a child already has most of the brain's structure and biochemical routes developed. It is to this end that Heckman (2009) reiterated the position that the process of skill formation would be easier at an early period as it is possible for this skill to grow along with the development of brain neurons. Cunha et al (2006) showed that investment is done at different stages of development i.e. at preschool age, during school age and during the post-school period (see fig 7). This indicates that the formation of skill and development of human capital is a multi-stage process that is very much hinged on proper investment in early childhood development.

Woldehanna (2011) explained that education learned at one stage is an input into the learning process of the next stage, implying that skills are self-reinforcing. Also, there is a multiplier effect to adequate early childhood investment. Investment in one stage directly improves

development at that stage and also indirectly positively impacts development and or productivity at later stages (Carneiro & Heckman, 2003; Woessmann, 2006, Cunha et al 2006)

Fig. 2: Rate of return to human capital development



Source: Cunha et al. (2006)

The figure above easily shows that a higher rate of return is experienced at an early period for the same amount of investment throughout a person’s life cycle. It underlines the fact that learning is easier in early life and that cognitive stimulation in the early stages is very important for long term development (Shonkoff et al., 2000; Cunha and Heckman, 2003)

Woessmann (2006) and Cunha et. al. (2006) from the human capital perspective advanced that there are particular stages in a person’s life cycle where investment is very crucial, and that when a person misses out on the desired investment like that required in early childhood, such deprivation may be costly and very difficult to regain later on in life. This description explains the crucial relevance of adequate investment in early childhood in terms of cognitive and behavioral development. This is further reiterated by Heckman & Masterov (2007) in their argument on productivity from investing in early childhood when they stated that:

“Skill begets skill; learning begets learning. An early disadvantage, if left untreated, leads to academic and social difficulties in later years. Advantages accumulate; so does disadvantage. That is why a large body of evidence shows that post- school remediation programs like public job training and General Educational Development (GED) certification cannot compensate for a childhood of neglect for most people”

2.1.4 ECD Center

An early childhood development program may either be a center-based ECD or an informal ECD center. A non-center-based ECD program is an intervention targeted at the children of 0-6years, their parents or caregivers. An example of an informal ECD center is home or community-based Programs.

A center-based ECD is a formal ECD care center where a toddler or child or pre-school children gets the training and support and care that’s appropriate for their age and stage of development. It may also be described as a premise providing an alternative physical and social environment to the home. ECD centers cater to children between the ages of 0 to 6 years. They are properly looked after while their parents or guardians are out on their daily business. It is very important that the centers provide age-appropriate stimulation and learning for the children’s cognitive and socio-emotional development.

A typical ECD center or facility should provide:

- An inclusive, safe and secure environment: the facility should be in a safe, clean and well looked-after building or premise, with constant adult supervision. It must have facilities to accommodate children with disabilities who may need special attention as well.
- A registered learning program: it must have a structured and developmental stage appropriate Programs for different age groups. These must encourage development through self-discovery, communication, and sensory skills, along with the promotion of self-control and independence.

- Qualified Early Childhood Development Facility principals: It is ideal to have properly qualified ECD facility practitioners or principals for oversight functions.
- Nutrition: An ECD facility must provide healthy meals for different age groups.
- Play: All children must have access to creative play at their ECD premises in order to help them learn through play.
- Enough space and ventilation: the facility must have enough ventilation and light.
- Safe drinking water: safe and clean drinking water must always be available.
- Clean and adequate toilet facilities: toddlers must have access to potties, toilets and washbasins and children over the age of 3 years must be able to reach the washbasins and toilets. Every child under 3 years must have his or her own potty. There must be adult supervision at all times when children use the toilet.
- Food prepared in a hygienic area: the food preparation area must be separate, clean and safe for food preparation.
- Measures for the separation of children of different age groups: where possible children must be separated into age groups i.e. 18 months and younger; 18 to 36 months; 3 and 4 years; 5 to 6 years. Children of school-going age must be kept separate from the other children.
- Emergency action plan: reasonable precautions to protect children from fire, accidents and other hazards must be taken. Emergency procedures with relevant contact details must be visibly displayed. Children must be made aware of emergency procedures.
- Policies and procedures regarding health care at the ECD facility: these processes involve dealing with the medical needs of sick children and children with chronic illnesses

2.1.5 Cognitive Development

According to Rao et al (2014), cognitive development may be described as advances in mental processes associated with perception, memory, reasoning, problem-solving, language-learning and other aspects of brain development that occur with increasing age. They observed from history that ‘children’s cognitive development was usually assessed through

intelligence quotient (IQ) tests' (Rao et.al, 2014) and several other appropriate tools are available to conduct a similar assessment in young children. There is currently no globally accepted test or assessment tool for early cognitive development. Rao et al (2014) further explained that “typical cognitive development can be defined as expected gains in language, thinking and understanding all of which encompasses intelligence, literacy, numerical ability, memory, problem-solving, learning ability, academic attainment, and cognitive control”. Atypical development can be characterized as a delay in expected gains.

2.2 Discussion of Existing Theories

The relevant concepts of impact evaluation and the various approaches to carrying a quality impact evaluation under different situations will be discussed under this section, and with particular to the framework for selecting appropriate designs and methods. Also, relevant literature over the works of Gottlieb and Blair & Raver is explored to provide a background understanding with respect to the holistic development of a child through the different developmental periods and the implications.

2.2.1 Discussion of Existing Approaches to Impact Evaluation

High-Quality research involves a scientific process and well-defined research plans covering questions, the analyses that will be reported before the beginning of data collection on the outcome, procedures, and techniques from the identification of sample, selection and assignment, inference, the statistical analyses and dissemination of information. All of these contribute to the success of any research endeavor including impact evaluation.

In a document “Impact Evaluation: methodological and operational issues”, the Asia Development Bank (2006) defined impact evaluation as an assessment of how the intervention being evaluated affects outcomes, whether these effects are intended or unintended. The proper analysis of impact requires a counterfactual of what those outcomes would have been in the absence of the intervention (Baker, 2000)

In the most general sense, impact evaluation is a research process whereby a researcher conducts a study to determine the effect of a particular intervention. Studies are often distinguished by various designs rather than different outcomes e.g., randomized design, QED (quasi-experimental design), or a pre-post design.

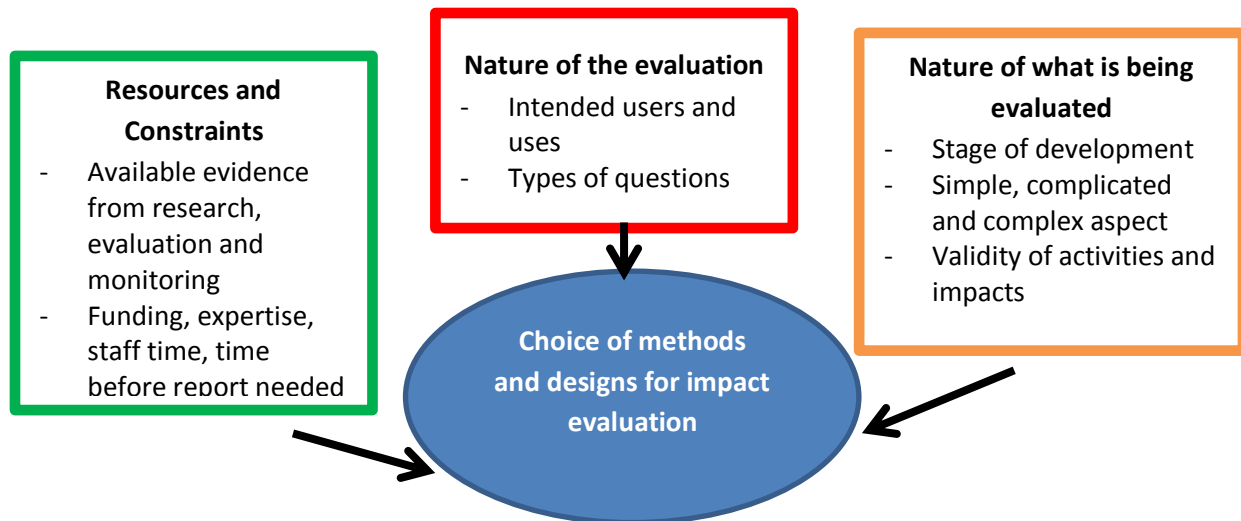
The approach employed in carrying out an impact evaluation on any intervention is largely dependent on three core elements (Stem et al., 2012). These include

1. The available resources and constraints - including time, timing, expertise, and existing data, as well as organizational standards and definitions for evaluation.
2. The nature of what is being evaluated—important features of the project, program or organization being evaluated, often described by program logic or theory of change, also considering the stage of the policy or program in its lifecycle, and whether it has aspects that are simple, complicated or complex.
3. The nature of the evaluation—in particular, its purpose, the key evaluation questions it is intended to answer and the requirements of key stakeholders.

The basic organizing principle for any good evaluation of an intervention is to ask the question: what would have happened in the absence of the intervention? What would have been the welfare levels of particular communities, groups, households, and individuals without the intervention? Evaluation involves an analysis of cause and effect in order to identify impacts that can be traced back to interventions (Ezemenari et al. 1999). It has been observed that millions of children, especially from developing countries within the preprimary age, are at the risk of not reaching their full development potential because they suffer from the negative consequences of poverty, nutritional deficiencies and inadequate learning opportunities (Lancet 2007). Poverty, malnutrition, and lack of proper interaction in early childhood can exact large costs on individuals, their communities and society more generally. The effects are cumulative and the absence of appropriate childcare and education in the three to five age range can exacerbate further the poor outcomes expected for children who suffer from inadequate nurturing during the critical first 1,000 days (Atinc & Gustaffson-Wright, 2013). All the risk factors are sufficient “to warrant interventions for malaria, intrauterine growth restriction, maternal depression, exposure to violence, and exposure to heavy metals,” (Walker et al. 2007).

It is not that ECD programs have not been operational or implemented at various levels and stages in different countries all over the world. There exist numerous ECD interventions. However, there is a need to do more and not only that, measures should be put in place to help determine how much impact these programs are making, what are the identifies gaps and how can the challenges be mitigated. The ability to monitor progress must be part of the central focus of interventions. This helps to provide an effective feedback mechanism for practitioners, stakeholders, and policymakers. It also helps to spur needed support especially from the political arena for the particular intervention.

Fig. 3: Framework for selecting appropriate design and method



Source: Adapted from Rogers et al., 2015

There are several methods that can be used in carrying out impact evaluation. A point to note here is that there is no single best method for all cases. What is however important is that the selected method or methods for a particular evaluation will depend on factors like design of the intervention, objectives of the evaluation, scope, and availability of data.

Why Evaluate ECD Programs or Interventions?

Engel et al. 2007 mentioned that:

“Awareness of child development is increasing in developing countries. The health sector has advocated for early child development programs for children with low birth weight, developmental delays, and low-income disadvantaged environments. Child development information is often incorporated into growth monitoring charts. Government-supported Preschool Programs for children are increasing; in the past 15 years, at least 13 developing countries have instituted compulsory preschool or pre-primary Programs. By 2005, the World Bank had financed loans to 52 developing countries for child development Programs, for a total of US\$1680 million, at least 30 developing countries had policies on early child development, and UNICEF was assisting governments in supporting parenting Programs in 60 countries.” (Engle *et al.* 2007)

The European Commission sees evaluation as a core discipline that supports the design, delivery, and performance of Programs. INTERact (2016) in a publication “Approaches, TOR and Methods for Impact Evaluation” considered as a working paper, observed that referring to past good evaluation work helps us understand where and how risk might be mitigated in the design of our new Programs, and ex-ante evaluation provides us with a good understanding of where we start from with our new initiatives. The publication also noted that evaluations during the implementation phase can help us understand whether Programs are doing what they are supposed to and at the end of a program life, ex-post evaluation helps us understand the changes and added value we have brought – ‘have we done the right things, and have we been doing things right?’

The challenge then is how much of these investments in ECD across the beneficiary countries undergo systematic impact evaluations, and needless to also say that the investments are even higher now.

Impact evaluation designs or approaches provide a holistic view of how an ECD intervention is working and will enable building a persuasive case for its impact, based on both qualitative and quantitative evidence. The various designs can also encourage team members to engage

more meaningfully in the planning, design, and implementation of ECD services, which will boost morale and ensure clarity about project goals. The results will provide a useful resource to draw upon when communicating with stakeholders and service users.

According to OECD (2001) “Evaluation Feedback for Effective Learning and Accountability Report”, impact evaluation serves both objectives of evaluation: lesson-learning and accountability. When it is appropriately designed, impact evaluation can answer the question of whether an ECD program is making the desired impact or whether it is not working. The insight on why and how a program works, and not just if it works, will also help support the choice or decision on scaling up of such an intervention.

With respect to ECD program design, impact evaluation can provide answers to raised questions on the design. Relevant information can be generated to answer questions on what works and what doesn't work.

The report for the DAC Evaluation Network (2000) buttressed that by identifying if development assistance is working or not, impact evaluation is also serving the accountability function. Hence impact evaluation is aligned with results-based management and monitoring the contribution of development assistance toward meeting the Millennium Development Goals.

2.2.2 Discussion of existing literature on Early Childhood Development (ECD)

In determining the relationship between ECD programs, cognitive development, and socio-emotional development, there is the need for a thorough analysis of literature that will help provide a well-defined position. ECD is multidimensional, involving different aspects of a child's development and well-being. This cuts across early childhood education, stimulation, and care, protection and health, and nutrition. An important fact to note here is that despite several positive pieces of evidence and impacts observed in the developed countries as a result of ECD interventions, the knowledge on child development with regards to what works in different countries, economics and socio-cultural contexts is still an evolving one.

The importance of providing quality ECD services

Where biological parents or guardians become unavoidably absent probably for a short period of time, ECD centers provide care and education to children. Hence it is paramount that, as the starting point in the value chain of education, the ECD services provided at the centers should be integrated and all-inclusive with components of health, nutrition, hygiene, safety, recreation, and education. This will form the substance for an appreciative level of achievement and cognitive capabilities for the child. The economic benefits especially for women includes the opportunities for parents to take up jobs or engage in commercial activities to enhance their economic status.

The relevant government institution or department with the oversight function to manage and coordinate the service provisions has a responsibility to ensure that conditions are created and adhered to for the optimum development of all children and their families through the provision and support of appropriate ECD services. According to Melhuish (n.d), the potential contribution to society of individuals who grow up in disadvantaged communities is far greater than that which is often realized. There is also an extra load on society's resources as people from disadvantaged backgrounds frequently show a greater need for state resources throughout their lives. This is the more reason why children with identified disabilities and other disadvantaged children should not be sidelined or ignored in order not to derail their opportunity for proper development. Rather, these children should be adequately catered for through ECD facilities by designing programs which attend to their peculiar needs as well. They can then greatly improve their chances grow up and become responsible members of their family and society at large.

As a result of the importance of the rights of the child, many countries agreed and adopted the United Nations Convention on the Rights of the Child in 1989. This was a milestone in the protection of the rights of children. As a convention, all the countries under the agreement are mandated to obey the agreement as adopted. According to the Convention of the Rights of the Child (1989), it tells us which basic rights children need in order to survive, be protected, develop and participate; children need special protection and care; the laws of the State are needed to protect children before and after they are born; ECD services have a

responsibility to educate children about their rights and responsibilities as part of their developmental programs; Governments should ensure that children are properly cared for, and protect them from violence, abuse, and neglect by their parents, or anyone else who looks after them; children who cannot be looked after by their own family must be looked after properly by people who respect their religion, culture, and language; children who have any kind of disability should have special care and support so that they can lead full and independent lives; Children have the right to be listened to, respected, protected, educated and cared for; children also have responsibilities towards others, they have to listen to others, care for and respect their peers, siblings, parents and other members of the community. All of the above will ensure the proper development of the child to become self-reliant, rational and responsible person.

Within the community, ECD service plays an important role as a vital support system. To this end, it is very important to ensure that personnel or practitioners of ECD exhibits a positive outlook in the manner with which they render the services. Opportunities should also be provided for continuous education and skills improvement for the personnel in order to provide them with new knowledge and better insight on attending to the sensitive needs of the children. And because the success the services depends largely on concerted efforts, parents, families, guardians and the community also have a vital role to play by working in collaboration with the ECD personnel.

For this work, and in order to provide the link between early childhood development programs and cognitive development of a child, the researcher draw upon Gottlieb's Experiential Canalization Model (1991, 1997), and Blair and Raver's (2012) analysis on individual development and evolution in light of experiential canalization.

2.2.2.1 Experiential Canalization

Waddington's study conducted in 1942 (as cited in Gottlieb, 1991) showed that before now, the suggestion was that traits in behavior were genetically determined. However, in more recent studies, it is observed that several influences affect behavioral development and not

just genetic factors alone. Waddington's idea of canalization was that no matter the number of influences or pressure on the development pathway, they can only be affected momentarily. He was of the opinion that they will "return to" or "remain on" the path as a result of strong genetic characteristics. Waddington's postulations did gain ground especially in the development psychology arena, his ideas still lack empirical content.

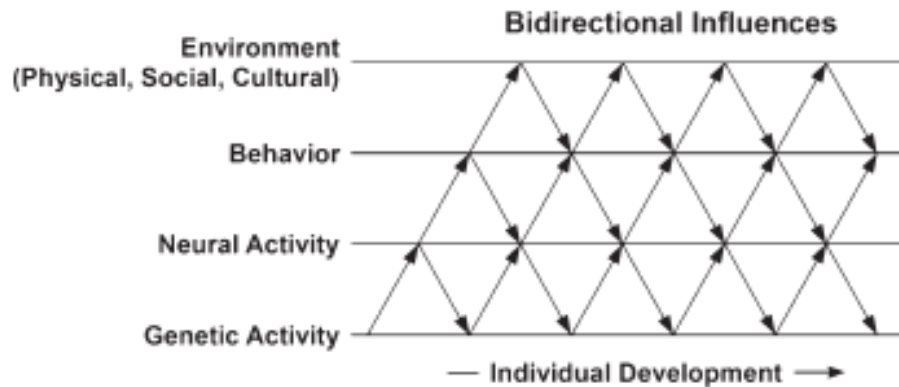
Holt (1931) was the first to introduce the concept of canalization when he referred to it as the development of a specific neural reflex for the development of the behavioral phenomenon. However, his idea was considered largely speculative. Canalization was also viewed from another angle by Kuo in 1976 (also cited in Gottlieb, 1991). Kuo was of the opinion that a person's history (with respect to chemistry, anatomy, physiology, and experience) plays a large role in the person's behavioral development. Though this view seems widely accepted, but also like Holt, Kuo fell short in providing empirical or experimental evidence of his proposition.

More recently, a more contemporary view of individual development has emerged. This observation also is known as the "systems view" of individual development considers development in multiple layers of elements that interact with one another in no particular direction. Several authors at different times have referred to the systems view with different terms and names. It is this view that Gottlieb (1970) referred to as probabilistic epigenetic.

Gottlieb countered the idea of a unidirectional model using the term 'probabilistic' with the notion that there exist a non-linear relationship and a non-deterministic relationship between different levels in the developmental system.

See figure 4 below:

Fig. 4: A simplified scheme of developmental systems showing four mutually interacting components (top-down and bottom-up)



Source: Gilbert Gottlieb’s metatheoretical model of probabilistic epigenesis (Gottlieb, 1992)

According to Lux (2013), the notion of bidirectionality and coaction originates from Gottlieb’s studies on acoustic development in avian embryos, based on natural observation and experimental work. Lux explained that Gottlieb demonstrated how the preference for the maternal assembly call after hatching, e.g. in mallard duck chicks, depends on pre-hatching experiences of embryonic species-specific vocalization, either in the form of self-vocalization or of vocalization of other chicks (Gottlieb, 1991, 1999).

Gottlieb’s work on experiential canalization which explored probabilistic epigenesis and psychobiological development is an attempt to close the gap between molecular biology and developmental psychology. Though the idea is still strongly evolving, notwithstanding, Gottlieb’s emphasis on the complexity and plasticity of the developmental process and the influence of non-genetic factors in the development process are highly relevant. He conceptualized four levels of development: genetic activity, neural activity, behavior, and environment (Gottlieb, 1991). He focused his work on the role of experience and the developmental environment as fundamental for genetic activity. And then later, he differentiated the environmental levels into physical, social, and cultural aspects (Gottlieb, 1992). This supports the fact that the environment has a significant impact on the development of the child.

2.2.2.2 Development Causality (Coaction)

Gottlieb (1991) explained that behavior in development happens as a result of the relationship between at least two particular components coaction, for example, person – person, person-environment, sensory stimulation – sensory system, activity – motor behavior. All of the parts of the system are capable of influencing all of the other parts of the system, however, indirectly that system may manifest itself (Gottlieb, 1991). The individual component (e.g genes) themselves cannot result in development but rather the interaction (coaction) between the components. It is not merely enough to know causality, it is also important as stressed by Gottlieb to emphasize the element of time to describe the coaction.

Blair and Raver's (2012) questioned the traditional evolutionary ideas of individual development by referencing Gottlieb's probabilistic epigenesis and positing that individual development is as a result of the combination of the environment and genetic activities. Their position is that this combination precedes evolutionary change. Their focus was on how experience shapes the development process in self-regulation. They see self-regulation as consisting of behavioral, cognitive, and physiological aspects of functioning which are organized by hierarchy and reciprocally integrated. Although they agree that there is an emerging fusion of the evolution and developmental approaches with regards to experience, behavior, and self-regulation, there distinction is important as well. The emphasis here is that individual differences should be edged in an experiential canalization framework. Hence in providing interventions in education, it should be considered that environments can be reformed in positive ways in order to yield neural, behavioral and physiological benefits.

Having understood what affects the development process of children and the implications as well, there is the need to consider ways to sharpen programs and make them more effective for enhanced results, especially for those children who are most underprivileged.

At the national level, a comprehensive standard of ECD programs and goals with regards to the knowledge and ability of the children over the different phases of their development progress should be readily available. An indicative evaluation of the standard should be exercised periodically in order to provide a comprehensive picture of the children's skills and abilities which then informs early childhood program delivery.

2.2.2.3 Lasting Effects of Early Childhood Development Interventions

According to the American Journal of Preventive Medicine (2003), early childhood is influenced by characteristics of the child, the family, and the broader social environment. Physical health, cognition, language, and social and emotional development underpin school readiness. Interventions or projects such as center-based ECDs with all-inclusive development programs are a community resource that enables the development of a child's wellbeing.

There is no doubt that the home environment plays a very important role in the developmental progress and proper growth of a child. However, it is noteworthy that increasing the capacities of caregivers also has a significant influence on a child. An improved knowledge and capabilities goes a long way in the provision of needed care and effective learning by the child. This invaluable opportunity further gives the child a better chance of endurance to survive with great potential for growth and optimal development.

The reach of ECD services can go far beyond young children and it is also important to stress the benefits to caregivers and society as well. It allows women to enter the workforce, and increase a sense of unity in the family and community. And it also helps cut poverty rates and break the cycle of poverty, increase GDP and public revenues.

The World Bank/Consultative Group (2000) on early childhood care and development share that inadequate nutrition before birth and in the first years of life can seriously interfere with brain development and lead to such neurological and behavioral disorders as learning disabilities. It also provided sizeable evidence show that children who are provided with better hygiene and nutrition, and who also enjoy the benefit of sufficient psychosocial stimulation display enhanced brain function at age twelve better than those children who did not enjoy similar stimulating environment.

Table 1: Reversing the real brain drain; early years study

Rethinking the Brain	
Old Thinking	New Thinking
How the brain develops depends on the genes that you were born with.	How the brain develops hinges on a complex interplay between the genes that you are born with and the experiences you have.
The experiences that you have before age three have a limited impact on later development.	Early experiences have a decisive impact on the architecture of the brain, and on the nature and extent of adult capacities.
A secure relationship with primary caregiver creates a favorable context for early development and learning.	Early interactions don't just create a context, they directly affect the way that the brain is 'wired'.
Brain development is linear: the brain's capacity to learn and change grows steadily as an infant progresses towards adulthood.	Brain development is non-linear: there are prime times for acquiring different kinds of knowledge and skills.
A toddler's brain is much less active than the brain of a college student.	By the time children reach age three, their brains are twice as active as those of adults. Activity levels drop during adolescence.

Source: Norrie M. M., & Mustard J. Fraser (1999)

With proper stimulation, the brain is half-matured when the child reaches around six months old and the brain attains nearly 90% of its final weight when the is about eight years old. The swift development is exhibited in a child's capabilities. Though it is true that every child is unique, the process and pattern of children's development are quite similar. If properly nurtured and stimulated, every child gets develop self-regulation, establish early relationships, develop in the acquisition of knowledge, and further develop specific skills.

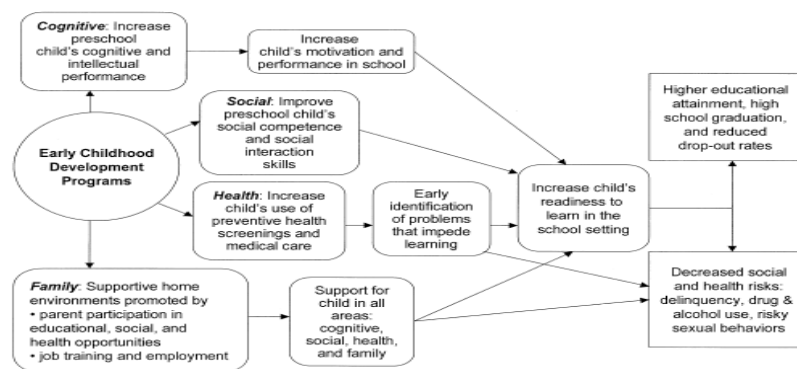
Early development opportunities establish a critical foundation for children's academic success, health and general wellbeing (VanLandeghem, Curgins & Abrams, 2002). The relation between the environment where a child lives, psychosocial exposure, the kind of caregiving the child receives and the physical activities exposed to all have some degree of influence on the development of the child in terms of suitability, readiness and impacting

school, and also on outcomes in later life especially as regards wellbeing and success (Hertzman, 1999; Brooks-Gunn J & Duncan, 1997).

The design of an all-inclusive quality early childhood development program should cater for the enhancement of cognitive and socio-emotional capabilities of preprimary children is at the core of its implementation. It should be comprehensive enough to also include the family with emphasis to provide a supportive home environment as well. Further, the intervention should be in such a way that children from poor or disadvantaged homes or communities must also benefit without making them feel inferior or in the face of any discrimination. The opportunity to provide these children a quality head-start in life goes a long way to strengthen their academic progression, provide a strong foundation for responsible behavior and help to mitigate problems of delinquency, dropping out of school, psychological problems, unemployment and physical morbidity in young adulthood (Hertzman & Wiens, 1996).

Power & Hertzman (1999) in their work “Health, wellbeing and coping skills” also assert that a strong relationship exists between measures of educational attainment and a wide range of adult disease outcomes. This means that when children enjoy quality early childhood development interventions, and they then graduate through higher education, they are likely to be cognizant of the importance of staying healthy and how best to steady healthy. This will also have a positive ripple on the economy of a nation as less pressure will be health services. Moreso, a healthy citizen will be much more productive.

Fig. 5: An analytic framework used to evaluate the effectiveness of programs for improving children’s readiness to learn and preventing developmental delay



Source: American Journal of Preventive Medicine (Anderson, 2013)

Prof. Melhuish (n.d) in his work “The Impact of Early Childhood Education and Care on Improved Wellbeing” emphasized the imperative to focus resources on early childhood development in order to improve life chances. He explained that doing this will help reduce inequality. Increase the wellbeing and enhance economic productivity.

The world is becoming increasingly complex and advanced especially with respect to desired skills and competencies needed for a good life. Poor children who do not have the opportunity or access to quality ECD interventions will miss out on chances later on in life. This may drive them to resort to crime and other societal vices for survival in adulthood. These problems are exacerbated over time as increasingly technologically advanced societies need more adaptable and technically skilled populations. In reality, the aims of equality and future productivity merge. Policies that recognized that learning capabilities are primarily formed during the first years of childhood, and which act to improve life chances, serve both of those goals (Melhuish, n.d). Therefore there is a need for proper and sufficient policies to be put in place to tackle problems of social exclusion and inequality, education and public health provision. And the policies must be able to integrate all these factors to provide a holistic service.

2.2.2.4 Impact of quality Early Childhood and Care on Cognitive and Non-cognitive Development

Atinc & Emily (2013), and Case and Paxson (2008) reiterated the significance of early childhood development and care. They emphasized that where there is a failure of adequate care for the child at the first critical moments of the child’s life, this may in the long-run impact negatively the development, impact and future economic success in adulthood.

Noticeable, children inherit some potential intelligence; however, the environment also plays a very important role in the development of a child’s full potentials. The need for adequate support and stimulation in interaction, cognitive, and socio-emotional areas early in a child’s life cannot be overemphasized. Research has shown that when these factors are duly considered and coupled with adequate nutrition and healthcare, a child most likely flourishes

with great potentials to perform well in all aspects of life while growing up having had a foundation where both the cognitive and non-cognitive skills have been developed.

According to Hughes (2011), he stated that:

“Various disciplines characterize these soft skills in different ways. Some psychologists see them as related to personality traits, while neurobiologists focus on the ability to control oneself (self-regulation) and related constructs. The cognitive components of self-regulation referred to as executive function, including the ability to direct attention, shift perspective, and adapt flexibly to changes (cognitive flexibility); retain information (working memory), and inhibit automatic or impulsive responses in order to achieve a goal such as a problem solving (impulse control)”

A typical example is where a child tries to concentrate to solve a numeracy problem in class while disregarding the noise from another classmate who has been crying for some kind of attention. It can be said that the child trying to solve a problem in class in spite of the prevailing distraction is relying very much on the abilities as posited by Hughes above. Self-regulation also includes emotional components such as regulating one’s emotions, exhibiting self-control, and delaying gratification to enjoy a future reward. Psychologists agree that skill in self-regulation

should be considered a key component of school readiness, just like emerging literacy (Blair and Diamond 2008; Ursache, Blair, and Raver 2012).

Evidence shows that appropriate investment in quality early years skills development improves productivity at other stages in later life as it tends to increase early skills with improved learning. This is from the point of view of self-productivity. Cunha & Heckman (2007, 2009) further provided strong evidence of self-productivity, especially for cognitive skills, and strong cross-productivity effects of non-cognitive skills on subsequent cognitive skills, with important implications for the timing of policy. Heckman (2008) further reiterates this when he stated, “skills beget skills”. Unfortunately, this is where children living in poverty suffer. Scientific research has shown that because of the disadvantaged and toxic environment, children living in poverty find themselves coupled with a continuous level of

stress, they lose out from enjoying sustained development. The environment impacts negatively and disrupts their ability to develop the needed cognitive and non-cognitive skills as they grow (Shonkoff et al 2012; Fernald, Marchman & Weisleder, 2013).

It can be seen that suggestions from various researches on ECD suggest that at no other time in a person's life does one learn and develop as fast and intensely as in the early years. The care and attention a child receives in the first eight years of life, particularly during the first three years, are critical and influence the child for life. Learning is not confined to children of a certain age or to a formal school environment. In fact, babies learn rapidly from the moment of their birth. They grow and learn the most when they receive affection, attention, and stimulation in addition to good nutrition and proper health care. Investments in early child development through early learning activities and improved school readiness along with health and nutrition interventions increase the likelihood that boys and girls will complete primary school.

Children learn how to behave by imitating the behavior of those closest to them and, as such, parents and caregivers need the knowledge and skills necessary to provide the child with the best early learning environment and interaction.

A wide body of research in the fields of anthropology, developmental psychology, medicine, sociology, and education points to the critical impact of development in the early years of childhood in the formation of intelligence, personality, and social behavior. The effects of neglect in these formative years can be cumulative and lasting.

According to the National Commission for Children Rwanda website, focusing exclusively on targeted interventions such as health and nutrition without considering the holistic nature of Early Childhood Development risks the hindrance of children's complete growth and development. Both biological and environmental factors affect brain development and behavior. For example, young children who experience extreme stress are at greater risk for developing cognitive, behavioral or emotional difficulties. These impediments can have lasting effects on children's readiness for school and later on their impact in school.

2.3 Model of Analysis

In this study, the model employed allows the researcher not only to look at data but also at the real people involved and at the extent of the impact of the intervention on the community. The descriptive and impact analysis were conducted after the researcher collected and cleaned the data. The descriptive analysis was used to answer the KEQs. By generating an assessment between the two groups under investigation, the research draws distinct comparisons so as to determine if significant differences exist. Impact analysis examined what the implications of the observed differences are on the participants, and if these differences were as a result of the ECD intervention.

In doing this, first, a 5-point Likert scale response system is introduced in the questionnaire in order to provide participants with response options and for the purpose of analysis. The aim is to allow the participants of the survey to express themselves easily on how much they agree or disagree with a specific statement on the questionnaire. According to de Winter and Dodou (2010), when responding to a Likert scale, participants specify their level of agreement to statements ordered on response levels:

5 = Strongly agree

4 = Agree

3 = Neutral

2 = Disagree

1 = Strongly disagree

Its characteristics are discrete instead of continuous values, tied numbers, and restricted range. A typical Likert scale will compose a series of four or more Likert-type items which represent similar questions combined into a single composite score or variable

The responses are entered into an excel spreadsheet where specific analytical operations are performed on them. Also, the works of Al Rubaish (2010) was adopted to the questionnaire for further analysis. The researcher then draws his inferences from the result of the analysis.

Dichotomous questions with specific yes or no answers were also included in the questionnaire. Some of the polar questions were designed to allow for further subtle probing by the researcher in order to elicit desirable responses from the respondents.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Description of the area of study

Huye District is one of the 8 districts which make up Rwanda's Southern Province. The district has 14 Sectors, 77 Cells and a total of 509 Villages (Umudugudus). It has an estimated population of about 328,298 with an average of 540 inhabitants per square kilometer and spread across 581.5 square kilometers. The urban population of 52,768 (16.07%) are resident in Tumba, Mukura, and Ngoma sectors (4th RPHC, 2012). Its number of households is estimated at 70,000 (NISR-EICV3, 2010/11). And the rest of the population are resident in the 11 other sectors in the district (NISR, 2018; 4th RPHC, 2012, NISR-EICV 3, 2010/2011). Maraba sector is one of the 14 sectors in Huye district, and it is a rural community. Maraba has 31 villages and 6 cells. By statistics from NISR (2015), it has an estimated population of about 27,500 and just over 6000 households. The predominant occupation in Maraba is subsistence farming, and the population ratio of female to male is almost an equal split.

Fig 6: Map of Huye District



Source: Huye District

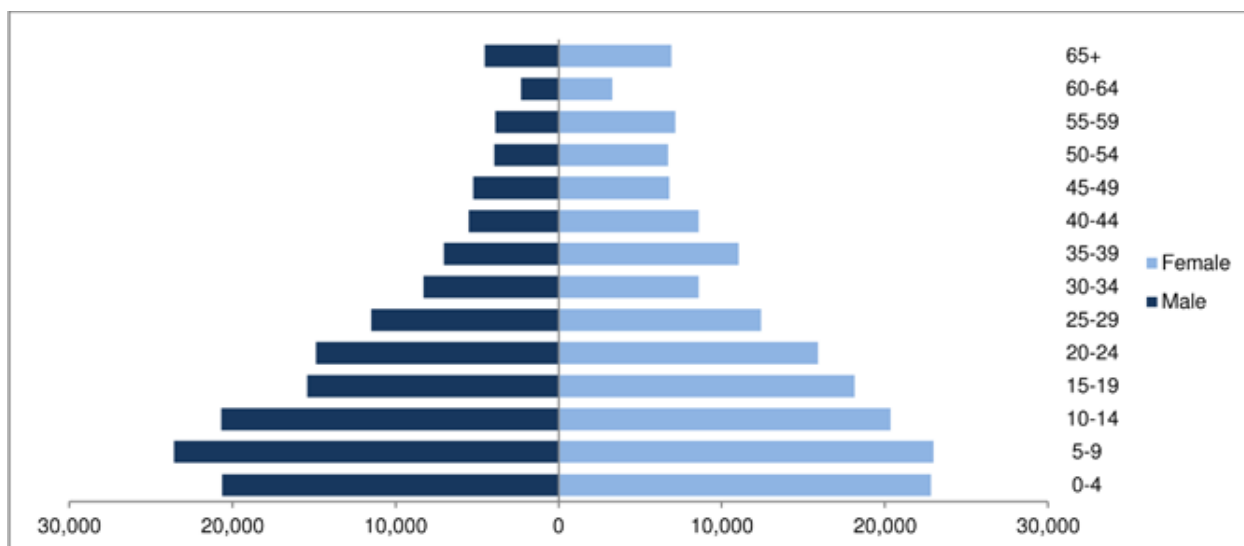
All the ECD centers in all the sectors had equal chances of being selected for the study. The rationalization for this decision is to ensure an unbiased representation from the district and to determine whether impacts (where observed) from ECD centers on beneficiaries are general or whether certain impacts are peculiar to particular settings.

3.2 Population and Sample

3.2.1 Population

A research population is often described as a large collection of individuals or objects with similar characteristics or elements, and it is also the main focus of a scientific study. Researches are often carried out for the benefit of a population. Most times, the population is too large and expensive for research hence the need to break them down into a subset called sample.

Fig 7: Distribution of the population in Huye by age groups and sex (000s)



Source: EICV 3

For the purpose of this study, the populations of interest considered are residents of Huye District as a case study. The researcher is studying a community within Huye District where ECD centers are located with focal attention on Maraba sector drawn through a simple random sample from the 14 sectors in the District. Particular consideration is on individuals and families who have either directly or indirectly been impacted by the ECD center in the community or who may not have benefitted in any way from any of the ECD centers in Maraba sector.

Table 2: Population of Maraba Sector

The population of Maraba Sector	
Total No of Household	6101
Total No. of Villages	31
Total No. of Cells	6
Total Population	27500

Source: National Institute of Statistics Rwanda, 2015

3.2.2 Sample and Sample Size

First, it is important to note that Huye district is majorly a rural area with just 3 sectors out of the 14 regarded as urban areas. For the 3 urban areas, observably they have some other educational facilities especially private institutions that provide early childhood development

services or similar services. Maraba sector was selected from the total number of 14 sectors using a simple random sampling. First, the population was divided into two clusters of urban and rural sectors. The probability sampling technique was used through a simple random sample of the rural cluster as the population of interest. The intention is to enable appropriate generalization. Other minimal factor considered in the selection of the sample included proximity, and other logistic factors, in order to serve the research purpose. From his research proposal, the researcher originally wanted to make a cluster sampling and select an ECD center for consideration from each of the 14 sectors in the district. This would have been much more inclusive, but at the same, it would have been quite expensive and would require more time and resources.

In choosing the ECD Centers, and other participants for consideration in the study, and also considering the fact that the study is comparative research, the researcher decided to work with ECD Centers from each of the 6 cells in Maraba sector. Participants or beneficiaries of the ECD centers serve as the experimental or treatment group. The control group was selected randomly from residents in Maraba sector.

The sample size for the experimental group of the study was originally 101 all of whom were randomly selected from the sample frame of beneficiaries of the ECD Program within the sector. They included parents, community leaders; ECD centers head-teacher and caregivers, sector administrators and children. Parents and ECD Heads signed consent forms allowing recording and pictures of the children for research purposes. But in order to avoid an unnecessary large variance with the control group which has ($n = 62$), the experimental group was further reduced to ($n = 65$). The reduction was done by randomly selecting a close number of participants as the control group. All selections from both groups were done randomly from all the 6 cells in Maraba sector.

3.2.3 Participants

The samples from the sector were divided into two groups:

- The experimental group and
- The control group.

Experimental Group: a final total number of 65 participants were selected for this group. All the respondents were from the 6 cells that make up Maraba sector. All of the participants consented voluntarily to partake in the research.

Control Group: The researcher also had 62 participants who were selected for the control group. Also, all the control group participants reside in Maraba Sector. It is pertinent to note that, all of the participants consented voluntarily to partake in the research as well.

3.3 Data Collection

According to Peersman (2014), for all types of evaluation, it is important to choose and implement methods for data collection and analysis in order to match the particular evaluation in terms of Key Evaluation Questions (KEQs) and with consideration for available resources. Impact evaluations should make maximum use of existing data and then fill gaps with new data, and the data collection and analysis methods should be chosen to complement each other's strengths and weaknesses. This study was conducted using a mixed-method design to inform decisions about identified gaps which can be mitigated so as to ensure continuity of the ECD interventions and also for likely scale-up.

There have been different nomenclatures given to evaluation surveys. Typical examples include the Qualitative Impact Assessment (QUIP) and Program Evaluation Survey (PES). This study particularly deals with the evaluation of the impacts of the presence of ECD centers in the communities. It seeks the benefits of such interventions on the lives of the people and to compare these benefits with those who perhaps also live in the community but are not direct beneficiaries of the program. Therefore to this end, which is the purpose of the study, the researcher chose to call give its own nomenclature for the survey as Program Impact Evaluation Survey (PIES).

Prior to study implementation, the main data collection instrument was shared with the researcher's advisor for review and further inputs. It was then given to a selected number of people in Gasororo Cell and Kinazi to complete as a trial assessment of the length of time to

complete the assessment and to identify unclear items, and other concerns with regards to correct completion of the questionnaires. Additionally, changes were made to shorten instruments and clarify questions according to trial responses. The revised questionnaire and consent form was then approved for use by the supervisor.

In the process of data collection for the study, the researcher ensured that quality was not disregarded in any way. To this end, the researcher made certain that data collected fulfilled the following commonly referred to the aspect of data quality (Peersman, 2014):

Approval: Approval to conduct the PIES study and recommendation for the same was provided by the university faculty. The document was presented to the relevant authorities both at the district office and the sector office where approval to conduct the research and also collect data was provided for the researcher.

Validity: The data measured what they were intended to measure.

Reliability: Data were measured and collected consistently according to standard definitions and methodologies; the results are the same when measurements are repeated.

Completeness: All data elements are included (as per the definitions and methodologies specified).

Precision: Data have sufficient detail.

Integrity: Data are protected from deliberate bias or manipulation for political or personal reasons.

Timeliness: Data is up to date (current) and information is available on time.

3.3.1 Questionnaire

Richard & Schmidt (2002) observed that the critical element to note when designing a questionnaire is to ensure that it is valid, reliable and unambiguous. The aim of the PIES instrument is to obtain information from beneficiaries (intended or otherwise) and non-beneficiaries who were typically 'ruled out' of the intervention. The essence is for them to share what their experience of the ECD intervention has been or otherwise.

Three main types of questionnaires are available to a researcher all with their corresponding advantages and shortcomings:

- Closed-ended or structured questionnaires (Seliger & Shohamy, 1989)
- Open-ended or unstructured questionnaires (Gillham, 2000; Nunan, 1999)
- A mixture of closed-ended and open-ended questionnaires

The researcher adopted the face-to-face method of administering the questionnaire and typically the respondents were encouraged to answer the questions in order to obtain a good rate of response return.

3.3.2 Informal Conversation

As a conversational strategy, the researcher engaged several respondents from the study at different locations in casual and informal talks around the theme of the study. The conversation were usually not in any particular format but mostly arose on the spur of the moment with the help of the data collectors. The respondents were not pressured in anyway and most of the conversations were usually started by them either as a form of further enquiry about the study or about the possibility of getting to know what the outcome of the study would be. This strategy availed the researcher the opportunity to complement qualitative data obtained with respect to specific research questions.

3.3.3 Observation

Zohrabi (2013) described observation as a preplanned research tool that is carried out purposefully to serve research questions and objectives. As for Johnson & Turner (2003), they considered observation as more importantly, enabling the researcher to combine it with questionnaires and interviews to collect “relatively objective firsthand information”. And Merriam (1998) believes that observation is a kind of data triangulation in order to “substantiate the findings.”

There are four types of observation methods that researchers can employ in any study depending on the types of research work undertaken, goals, timeframe and ethical

considerations. This ranges from detached observation with no involvement from the researcher (complete observer), to completely engaging in the research environment (complete participant) (Sauro, 2015).

The researcher took advantage of several visits to the selected communities and ECD centers to perceive activities firsthand at the ECD centers and especially also to take good notes of how beneficiaries take advantage of the intervention. Though the researcher had a few informal conversations for insights, the research was a complete observer as he did not obstruct or interrupt participants during the observation. For the study, the observation helped to also obtain relevant background information about respondents, build a good rapport and provide a good ground for cooperation in participating in the research. This formed a good starting point for the study as the researcher was able to obtain credible information that helps to explain status before ECD intervention in the community and how much impact has been derived so far from ECD programs.

3.4 Mixed Method Research Approach

Appleton & Booth (2005) posited that when considering ways to combine quantitative and qualitative methods and data, it is important to be aware of their comparative advantages and to recognize that ‘strong fences make good neighbors’.

Reality is that there is hardly any single evaluation methodology that can fully capture all the intricacies of a program. Hence, it is the responsibility of evaluators to find the best possible combo of methods in terms of designs, frameworks, tools, and techniques (Bamberger, Rugh and Mabry, 2012).

The mixed-method approach mainly integrates selected quantitative and qualitative approaches in terms of theory, data collection, data analysis, and interpretation. Though, a growing trend is the use of several methods for evaluation work by professionals in the field of evaluation, “What distinguishes mixed-method evaluation is the intentional or planned use of diverse methods for particular mixed-method purposes using particular mixed-method designs” (Greene, 2005).

The purpose is to strengthen the reliability of data, validity of the findings and recommendations, and to broaden and deepen our understanding of the processes through which program outcomes and impacts are achieved, and how these are affected by the context within which the program is implemented (Bamberger, 2012). The mixed-method evaluation approach creates the platform to not only combine data collection methods but allow a combination of hypothesis development, conceptual frameworks, data analysis and even frameworks for the interpretations of research findings. An impact evaluation that combines qualitative and quantitative methods can generate both a statistically reliable measure of the magnitude of the impact as well as a greater depth of understanding of how and why a Program was or was not effective and how it might be adapted in future to make it more effective (DFID, 2008).

The researcher is of the opinion which supports the school of thoughts that the mixed method approach to impact evaluation provides more resourceful evaluation results because it produces data that can be aggregated and analyzed to describe and predict relationships (quantitative part), and can help to probe and explain those relationships and to explain contextual differences in the quality of those relationships (qualitative part).

Bamberger (2012) showed that when planning an MM evaluation, four necessary conditions for designing a mixed-method evaluation approach are required:

1. At which stage or stages of the evaluation will mixed-method be used?
2. Will quantitative and qualitative methods be used sequentially or concurrently?
3. Will quantitative and qualitative methods are given relatively equal weight, or will one methodology be dominant? And,
4. Will the design be single- or multilevel? (Bamberger, 2012)

3.4.1 Combining methods in impact evaluation

With the view that the mixed evaluation approach is quite powerful in producing valuable results at different levels, it can be categorized via ways of combining and sequencing. Carvalho & White (1997) usefully describe three ways of combining the best of qualitative and quantitative approaches:

- i. Integrating methodologies for better measurement. For example, insights from qualitative and quantitative studies help to define population sub-group sampling frames. Also, Qualitative analysis helps determine appropriate stratification of the quantitative survey and disaggregation (along with age, gender, etc)
- ii. Sequencing information for better analysis can allow for examining, explaining, confirming, refuting, and/or enriching information from one approach with that from the other for better analysis. A perfect example here is where qualitative study generates ‘working hypotheses’ which can then be further examined through quantitative research with specific predetermined questions.
- iii. Merging findings. Garbarino & Holland (2009) showed that “during the analysis phase of impact evaluation emphasis shifts to ensuring that data are merged sufficiently for improved analysis and policy influence.”

3.4.2 Triangulation

Triangulation will be used to obtain independent QUANT and QUAL estimates for key variables (such as the use of ECD centers by residents of the communities and their attitudes toward the facilities). A key feature of triangulation is that procedures are built in to identify any inconsistencies in different estimates and to follow up to understand the reason for the differences. For example, observation of how people coming to the ECD center is received, or enquiring from members of the community and discussing informally whether and when they use the facility, will be compared with survey responses. The idea is to complement each other while reflecting responses through different perspectives. Bryman (2012) described triangulation as the use of more than one method and source of data to cross-check findings.

3.5 Randomized Control Trial (RCT)

A randomized controlled trial (RCT) is a way of doing impact evaluation in which the population receiving the program or policy intervention is chosen at random from the eligible population, and a control group is also chosen at random from the same eligible population. It tests the extent to which specific, planned impacts are being achieved.

In an RCT, the program or policy is viewed as an ‘intervention’ in which a treatment – the elements of the program/policy being evaluated – is tested for how well it achieves its objectives, as measured by a predetermined set of indicators. The strength of an RCT is that it provides a very powerful response to questions of causality, helping evaluators and program implementers to know that what is being achieved is as a result of the intervention and not anything else (White, Sabarwal & Hoop, 2014)

Using a randomization approach means that a target population is first identified by the program implementer and then program access is randomized within that population. There are two main reasons to randomize at a level larger than the individual. First, it can address contamination: where treated individuals mix and chat and potentially “share” treatment with individuals in the control group. This would “contaminate” our impact, and our control group would no longer be a good comparison. Randomizing at the village level may minimize the risk of this happening. Second, we might want to randomize at the level that the intervention would actually be implemented: for example, an intervention that provides electrification to schools. It is logistically impractical – if not impossible – to randomize electricity access over schoolchildren (betterevaluation.org).

According to Leeuw & Vaessen, (2009), a simple comparison of average outcomes in the two groups solves the attribution problem and yields accurate estimates of the impact of the intervention. But, despite the clean design, RCTs have to be managed carefully to ensure that the two groups do not have different rates of attrition and that there is a minimum of “contamination,” when the control group ends up being exposed to the intervention (either because of geographic proximity or because of the presence of similar parallel interventions affecting the control group)

3.6 Technique of Data Analysis and Interpretation

An important aspect of every evaluation is the analysis of several data so as to draw up a summary from them while looking for patterns (Peersman, 2014).

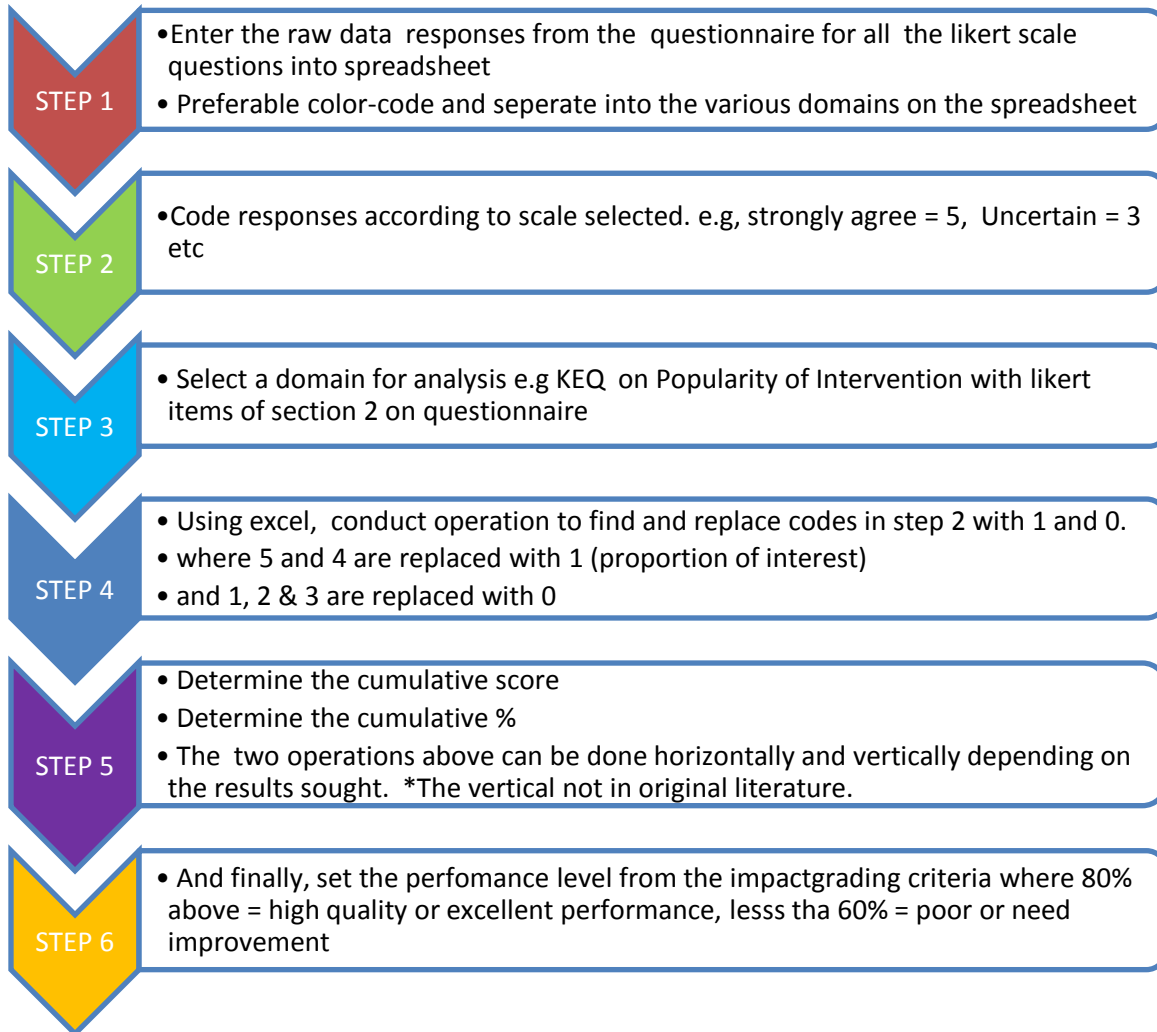
Tukey (1961) defined data analysis as: “Procedures for analyzing data, techniques for interpreting the results of such procedures, ways of planning the data gathering so as to make analysis much easier, more precise or more accurate, and all the machinery and results of (mathematical) statistics which apply to analyzing data”. More recently, (Schwandt, 2007) described data analysis as trying to make sense of data, by theorizing and interpreting it while searching for general statements among the categories of data. This takes some form of deductive and inductive reasoning or approach in order to make sense of the data (Best & Khan, 2006). Neuman (2011) suggested that no single qualitative approach can answer all qualitative data analysis. A vital point to note here is that the method employed in the process of analysis of data will somewhat depend on the strategy of the research and methods used in collecting the data.

For this study, the researcher employed descriptive data analysis during the study by the use of qualitative content analysis where unstructured textual content from the survey is reduced into manageable data relevant to the evaluation research questions. Data collected were first organized in a meaningful way. Thereafter, the organized data are entered into an excel spreadsheet for further operations. The investigation was described in an activity that includes an explanation of the various aspect of the research through the KEQs, the responses, and opinions of the participants and how the intervention activities may have influenced the participants. The last step of analysis is the interpretation phase. This process involves a thorough and clear explanation of the research findings. This is done in such a way that readers can easily make meanings from the explanations and easily draw their own interpretations. The interpretation of the research findings was in such a way as to easily help to answer the questions from the research.

For the causal KEQs which also imply analyzing the causal attribution, the researcher sought to determine what would have happened in the absence of the intervention by using the obvious status of the comparison group. Also, the researcher wanted to identify patterns that would be consistent with a causal relationship (Peersman, 2014).

Find below the process for the Likert scale spreadsheet analysis in order to determine the cumulative percentage. The operation was performed on both groups and the results compared.

Figure 8: Steps for Likert analysis to determine cumulative % and impact



Source: Researcher

See Appendix 3 for the results of the Likert analysis on the 6 domains or KEQs for both samples.

In communicating the evaluation findings, the researcher found the use of data visualization as a relevant tool to effectively serve the purpose of interpretation. The concept of using

pictures to understand data can be traced to the 17th century when maps and graphs were used and in 1800s when the Pie chart was introduced. Data visualization is the presentation of data in a pictorial or graphical format. It enables decision-makers to see analytics presented visually, so they can grasp difficult concepts or identify new patterns (www.sas.com). It helps to comprehend information quickly, identify relationship and patterns which may otherwise be unclear or difficult to discern, pinpoint trends, and enable the effective communication of the story to others. As much as possible, the researcher aims to present the conclusions of the impact evaluation in a manner that is transparent and verifiable by readers.

CHAPTER FOUR

RESULTS AND DISCUSSION OF FINDINGS

In the research work, data collection, tabulation, analysis, and interpretation is very important. This chapter presents the results of the research with regards to the KEQs or research questions, and the interpretation of the results. It describes the statistical procedure adopted to generate results and also the qualitative analysis of the responses of the participants.

4.1 Presentation and Analysis of Results

The researcher considered survey data from all the 6 cells in Maraba Sector. The idea was to have an element of representation from every portion of the population of study for the research. From each of the cells, data collected was separated into two basic groups, that is, those who have benefitted from the ECD centers as an intervention by one way or the other, and those who have not participated by any means in the intervention. This observed coverage was intended to generate some form of comparison in order to help determine the level of impact of the ECD centers on the lives of the people and the community.

Analysis of the data is as important as any other component of the research process. Regardless of how well the study is conducted, inappropriate analysis can lead to an inappropriate conclusion (Gay, 1996). According to Johnson & Christensen (2008), data analysis is described as the creation of meaning out of raw data. The authors propose a process of data analysis that involves data collection, data entry, and storage, segmenting, coding and developing category systems, identifying relationships (e.g. themes, patterns, and hierarchies), constructing diagrams, tables, and graphs and finally corroborating and validating results (Johnson & Christensen, 2008). Data analysis involves the process of bringing order, structure, and meaning to the mass of collected data. It is a messy, ambiguous, time-consuming, creative, and fascinating process. It does not proceed in a linear fashion; it is not neat. Qualitative data analysis is a search for general statements about relationships among categories of data. Hitchcock and Hughes take this one step further:

"...the ways in which the researcher moves from a description of what is the case to an explanation of why what is the case is the case."(Hitchcock and Hughes, 1995)

A quick point to emphasize here is that while an impact evaluation aims to look at the longer-term results of a program or policy, decision-makers often need more timely information and therefore data on shorter-term outcomes should also be collected. The researcher put this factor into consideration during data collection by as well looking at short term results through observation and records on the level of involvement of students in learning and the level of participation of parents and the community at the centers. The assumption here is that these short term results are predictive of the long term effects.

The questionnaire has 34 items (Appendix 1) with 3 question-type parts and these parts are the

- Likert Scale question
- Dichotomous questions and the
- Opinion-based questions

The Likert Scale component has 24 questions with a response grade of five points indicating the degree or extent of agreement with a statement in descending order: 5= Strongly Agree/A Very Large Extent; 4=Agree/Large Extent; 3=Neutral/Uncertain; 2=Disagree/Small Extent; 1= Strongly Disagree/Very Small Extent.

The dichotomous questions are basically questions that require respondents to answer Yes/No. For this study, the researcher employed its use to buttress responses within each of the 6 domains contained in the questionnaire.

In order to also seek the participants' perspectives on the subject matter, the researcher asked the respondents to make suggestions or give their opinion on the final part of the questionnaire. This is where the opinion-based question came into use.

For the data analysis, the researcher was interested in existing and more recent simplified method of analyzing Likert scale data in order to adapt it for the purpose of the PIES research

and so as to provide a streamlined interpretation which will be easy to comprehend. The idea is to build on this effort for future research purposes. The opportunity presented itself in the work of Al Rubaish (2010) where he studied the contribution of the Student Experience Survey (SES) regarding quality management in higher education in Saudi Arabia. In the study, Al Rubaish (2010) used four measures (The Arithmetic Mean, Median, First Quartile and the Cumulative Percentage).

Table 3: Criteria used for the analysis of the PIES items

Impact Grading	Mean	Median	First Quartile	Cumulative %
High Quality	3.6 & Above	4 & 5	4 & 5	80 & Above
Acceptable	2.6 - < 3.6	3	3	60 to < 80
Improvement Required	< 2.6	1 & 2	1 & 2	< 60

Source: Adapted from Al Rubaish, 2010

Having thoroughly reviewed his work, the researcher set out to find the best possible measure of analysis for this study which also helped to produce the different levels or grades of impact as indicated in Table 3. Also, in adapting Al Rubaish work for this study, and in determining the best impacts from the survey, the criteria in Figure 9 was set.

The researcher discovered that the mean in Table 3 does not represent the best option for the PIES study as the mean rating is not correct because it treats the categorical variables as if they are continuous thereby assigning them properties they do not have. Rank data do not have divisible or multiplicative ability. Hence, it is not useful for the analysis desired. In fact, in the mean, a respondent may choose not to respond to any question and still score high during the analysis. This kind of scenario will definitely produce a false result.

For the median in Table 9, the challenge arises where 3 on the Likert scale is not a response, it will indicate as non-response (neutral or uncertain) and possibly having an acceptable impact better than a poor attempt (in the form of 1 on the Likert scale). This is problematic and will definitely create a wrong result of analysis and interpretation. The operation on the quartile is also similar to that of the median but it is split into four parts. The first quartile

falls below the 25th percentile, the second quartile = 25th but less than 50th and also referred to as the median, the third quartile = 50th percentile but less than 75th percentile and the 4th quartile = 75th percentile and above. Both the median and the quartile have the same grading results.

Having explained and also considered the mean, median, and quartile analysis as insufficient to provide the desired result sought because of the identified shortcomings, the cumulative percentage appears as the most acceptable operation in order to obtain the best results.

Where the questions are positive, the cumulative percentage will be on Likert scales 4 and 5, then on 1 and 2 if they are negative. For the operation, it will equal:

number of persons who chose 4 or 5 on the Likert scale or the particular domain under consideration, divided by the total number of persons who answered the particular question.

That is,

No. of persons who chose 4 or 5 / Total number who answered the question

Considering the cumulative percentage operation, the interest is on “High Quality” or “Excellent” impact or delivery. The definition of the result in terms of intervention impact from the cumulative % is thus as follows:

Figure 9: Impact Grading



Source: Researcher (Adapted from Al Rubaish, 2010)

Regarding demographics, the population of Maraba is quite representative of the typical population of rural Rwanda. It is rural and with lower levels of income. From the most recent available statistics of the National Institute of Statistic Rwanda (NISR-EICV 5, 2017), the

total number of household at Maraba is 6,101 with a population of about 27,500. The sector comprises of 6 cells which make up 31 villages with an average of 5 villages per cell.

For the purpose of the research and to ensure representation by all the 6 cells, one village was randomly selected from each of the cells.

Table 4: Maraba Sector – Number of Cells and Villages

Villages and Cells in Maraba Sector

		VILLAGES (31)								
CELLS (6)	1	Kabuye	Murama	Gasharu	Nyamvumba	Nyarusange	Rukeri			
	2	Kanyinya	Kayeye	Bwegera	Kabirombe	Gikomero				
	3	Gasumba	Taba	Gitabure	Kinombe	Gitwa				
	4	Buremera	Buremera	Gasarabuye	Kinazi	Nkorwe				
	5	Shanga	Gasororo	Mpinga	Nyamiyaga	Rutontwe	Nyantende	Gatyazo	Kabirizi	Shyinga
	6	Shyembe	Kizi	Kagoma	Kigarama	Gisagara	Karambi	Karambo		

Source: Researcher

An initial total of N = 182 respondents completed the survey containing questions about demographics, KEQs, and opinions. Of the pool of initial total number of respondents who were screened, 166 participants' responses were eligible for evaluation based on the specified criteria (i.e., at least resident in one of the 6 cells of Maraba sector). Data was collected from these participants who qualified by compliance with the minimum criteria. 16 participants were removed from the sample due to their inability to meet the minimum criteria of residency in the sector. And 3 participants were also removed from the sample for incomplete survey documents.

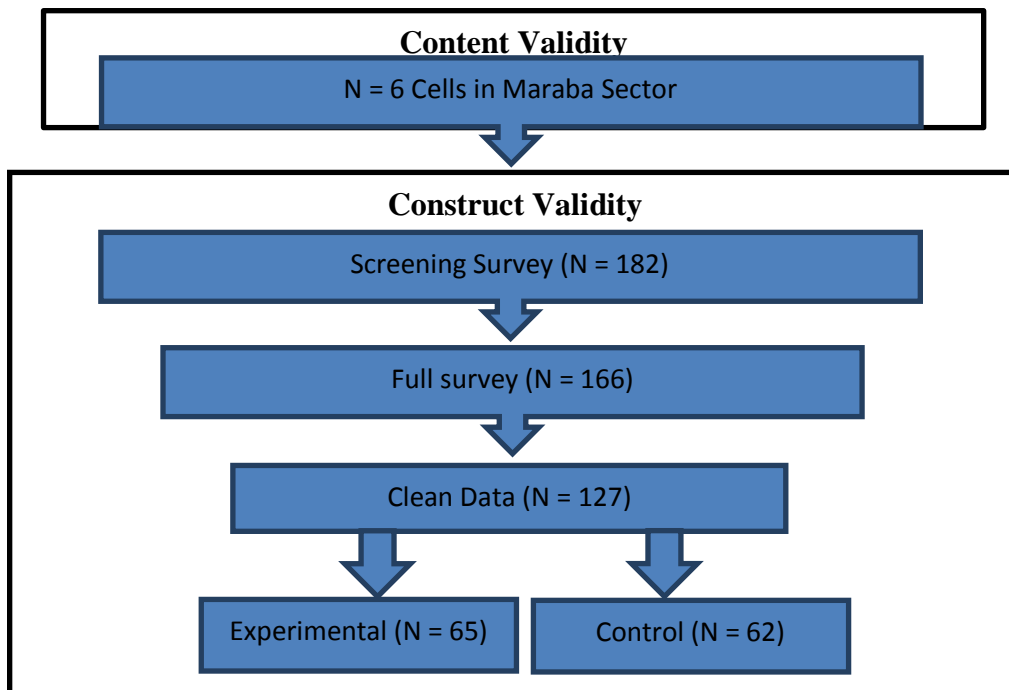
Table 5: Age bracket of respondents

Age Bracket of Respondents						
Ages	0-10	11-20	21-30	31-40	40+	Total
Experimental Group	6	8	10	24	17	65
Control Group	8	5	8	22	19	62
No. of Respondents	21	13	26	59	44	127

Source: Researcher

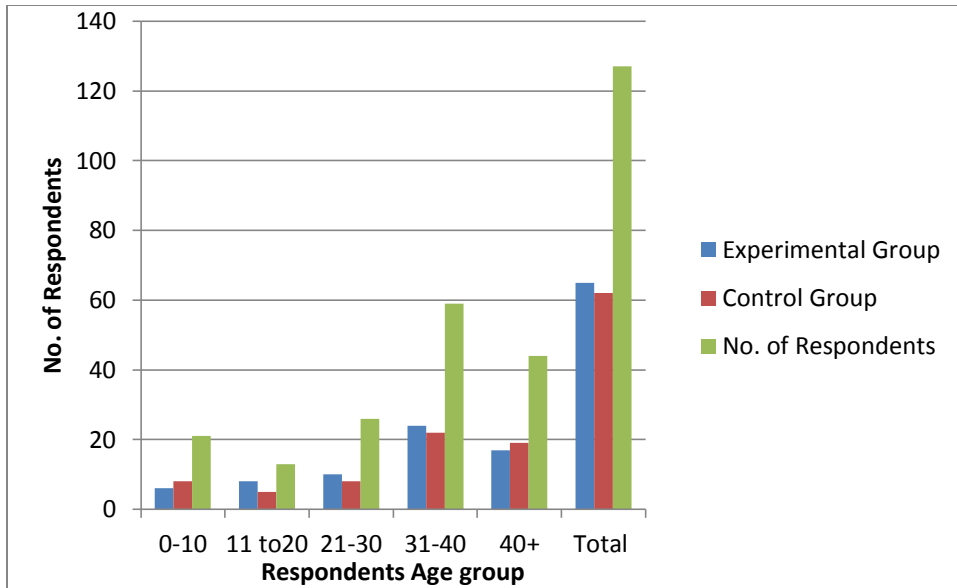
Further, to avoid the possible challenges of a large degree of variance inherent with comparing a large sample size with a small sample size in the same investigation, the researcher thought it wise to split the respondents to close sizes. Hence, the experimental group size was further reduced through random selection. Thus, a final sample of $N = 127$ participants was retained for analysis. From this number 65 respondents form the experimental group while 62 participants form the control group.

Figure 10: Visual display of sample sizes for each phase of the study.



Source: Researcher

Figure 11: Age brackets of respondents compared by groups



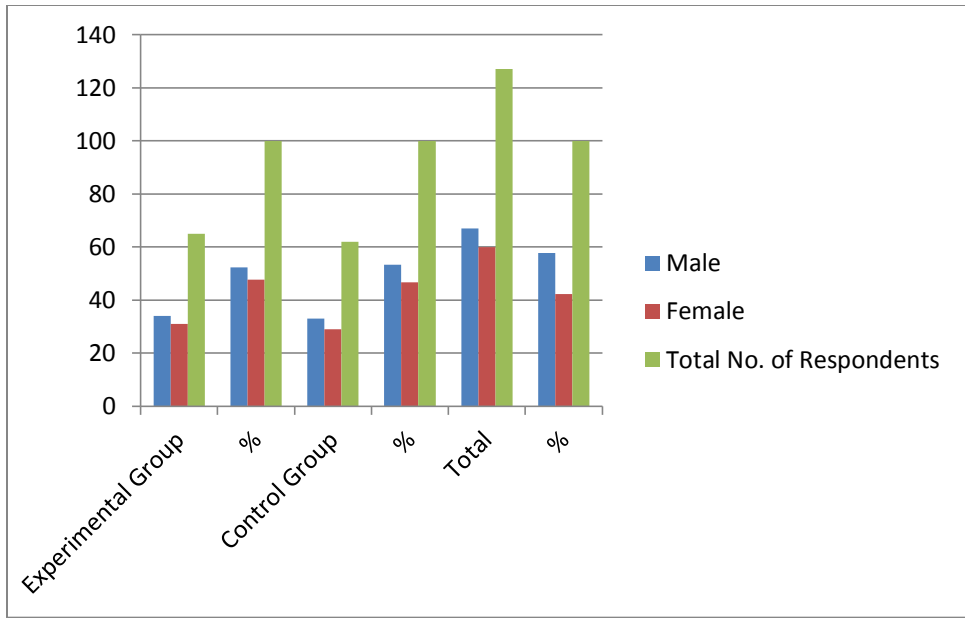
Source: Researcher

Table 6: Number of respondents by sex

Number of Respondents						
Sex	Experimental Group	%	Control Group	%	Total	%
Male	34	52.3	33	53.2	67	57.7
Female	31	47.7	29	46.8	60	42.3
Total No. of Respondents	65	100	62	100	127	100

Source: Researcher

Figure 12: Percentage representation of participants' sex



Source: Researcher

Table 7: Mean and Standard Deviation of Age

	Experimental	Control
Mean Age	13	12.4
Median Age	10	8
Standard Deviation	7.4	7.6

Source: Researcher

Doing the final analysis, from the sample, the descriptive statistics indicate a total of 67 males (57.7%) and 60 females (42.3%) with an age range of 0-10 to 40 and above. From the 65 persons in the experimental group, 52.3% were males and 47.7% were females while the 62 respondents in the control sample had 53.2% males and 46.8% females.

For the experimental group (mean age = 13, median age = 10 and SD = 7.4) and the control group (mean age = 12.4, median age = 8, and SD = 7.6)

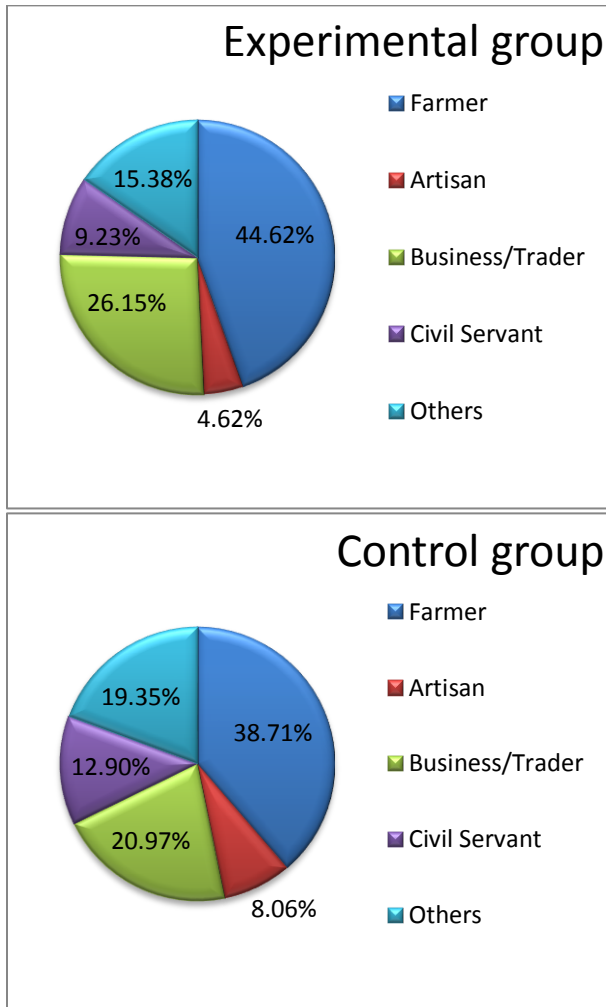
Test of significance of age between the two groups

Comparing sample means (t-test) for the ages of the two groups, d.f = 124, t-value = 0.45, and

p-value = 0.653. This shows that Means are not significantly different where $p < 0.05$ (See Appendix 1.1) for further details of the operation.

Between the two study samples, there is little variance amongst the main occupation engaged by the respondents. The trend is quite similar where participants in about 45% of the experimental group engage farming as a major occupation and close to 40% of the control group engage farming as the main occupation too.

Figure 13: Comparison of occupation between the two study groups



Source: Researcher

26% of the experimental group does a form of business or trading activity while about 21% of the control group engages the same activity as well. Those who are involved in some other form occupation are 5% and 8% of the two groups respectively. It is obvious from this information that agriculture is the mainstay occupation of the communities. The control

group contains a little more (about 20%) of participants who have other forms of occupation, and this portion is 15% on the experimental group. Though from further inquiries during the field visits the researcher observed that apart from their primary occupation, some members of the community do engage other of income-generating activities to complement the core occupation.

Data was collected using different tools as necessary. This included the use of a questionnaire as earlier stated and observation as indicated in the below table.

Table 8: Evaluation Matrix: Matching data collection to KEQs

Key Evaluation or Research Questions (KEQs/RQs)	Program participant survey	Observation of program implementation
KEQ 1 How popular are the ECD centers within their host communities?	X	
KEQ 2 What are the factors that determine the enrollment of children at the ECD centers?	X	X
KEQ 3 Does the learning approach at the centers have a significant impact on program quality outcomes and cognitive development?	X	X
KEQ 4 Do the ECD centers improve elementary school readiness upon entry into grade P1?	X	
KEQ 5 Are there significant changes in parenting practices and time spent with children in educational activities?	X	X
KEQ 6 How can the ECD programs/centers scale-up for continuous impact in the host communities?	X	

Source: Researcher

Data collected from the PIES survey through questionnaires were entered into an excel spreadsheet where they were analyzed. The survey questionnaire contained 34 questions which were then divided into 6 domains with respect to the various themes of the research questions. Each domain has about 4 related questions each which combined to form a specific research question for the domain.

A 5-point Likert scale was used because respondents are often not comfortable with providing a solid yes or no to some questions, but prefer shades in their answers. The core

interest here is analyzing these responses and determining a statistical result from the responses.

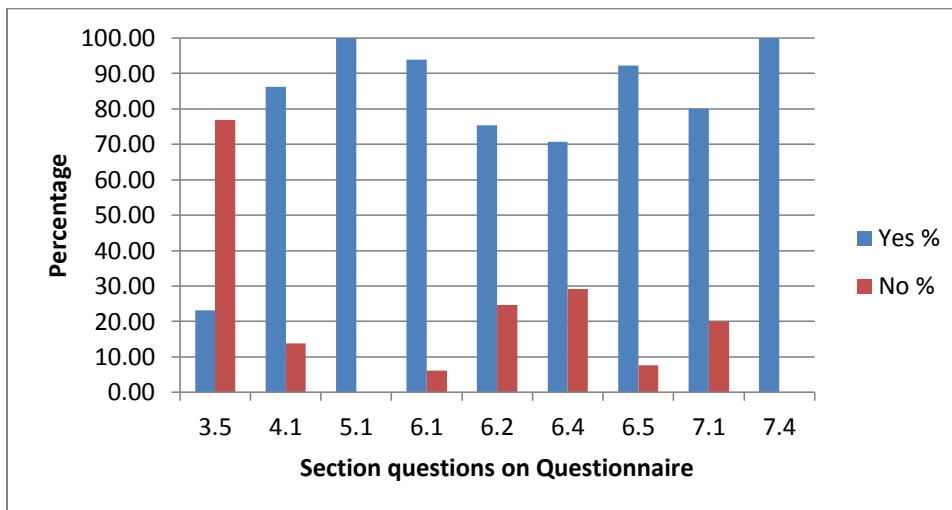
Also on the questionnaire, there are a couple of dichotomous questions as well which were ascribed a Yes or No response and one section which provided respondents the opportunity to provide options or suggestions to the question.

Table 9: Percentage responses to dichotomous questions from experimental group

Dichotomous Questions on:	Dichotomous Questions for Experimental Group					
	Section	Responses		% Representation		Total %
		Yes	No	Yes %	No %	
Facilities for Special Needs kids	3.5	15	50	23.08	76.92	100
Specific curriculum	4.1	56	9	86.15	13.85	100
Positive impact on acad. development	5.1	65	0	100.00	0.00	100
Support from staff to parent	6.1	61	4	93.85	6.15	100
Parent participation in center	6.2	49	16	75.38	24.62	100
Play with children at home	6.4	46	19	70.77	29.23	100
Practice what you learn	6.5	60	5	92.31	7.69	100
Regular feedback to parents	7.1	52	13	80.00	20.00	100
Routine evaluation	7.4	65	0	100.00	0.00	100

Source: Researcher

Figure 14: Pictorial representation of Table 9



Source: Researcher

Table 9 and its representation in Figure 14 indicate beneficiaries agree that the intervention has had significant impact in terms of academic development of their children (Section 5.1), practicing what they learn from activities organized at the ECD centers for parents (Section 6.2), and through adequate support (Section 6.1) and regular feedbacks (Section 7.1) from the caregivers on the performance of their children. Also, their responses show that for the program to further scale upon its standard, routine or periodic evaluation (Section 7.4) similar to the study should be encouraged, and facilities for children with special needs should be introduced as against the current lack of such facilities in almost all the centers (Section 3.5).

Table 10: Descriptive Statistics for dichotomous questions

	Yes	No
Mean	52.11	12.89
Standard Error	5.15	5.15
Median	56	9
Mode	65	0
Standard Deviation	15.46	15.46
Sample Variance	239.11	239.11
Kurtosis	4.63	4.63
Skewness	-1.99	1.99
Range	50	50
Minimum	15	0
Maximum	65	50
Sum	469	116
Count	9	9
Largest(1)	65	50
Confidence Level (95.0%)	11.89	11.89

Source: Researcher

The descriptive statistics on the dichotomous questions show that the questions have equal sample variances (239.11) and the standard deviations (15.46) are the same as well. The mode of Yes response is 65 showing the questions on academic development and routine evaluation with the highest responses. Both Yes and No responses share similar ranges (50) while the total sum of responses is Yes (469) and No (116). The operation was done using the same confidence interval of 95% degree of confidence.

4.1.1 Observation of Participants

During the research planning stage, the researcher drafted an observation guide that was meant to be used in the field. But on the field, it was rather ineffective as it was hard to follow which made the researcher adopt a more friendly but direct approach. The idea was to be completely detached (complete observer) from involving or interrupting the regular day-to-day activities of the study participants as explained in the data collection tools. During the observation at some of the ECD centers in Maraba sector, the first thing the researcher noticed is that the majority of the model ECD centers are provided by international and local NGOs and churches. Most of the classes have an average number of 45 children per class with an almost equal number of male/female gender representations amongst the children. Some classes could have slightly above 50% for boys and less for girls while the reverse is the case for other classrooms. However, the ratio of caregivers to the number of children in the class was observed to be largely unequal with an average of 1:45 to a class to fend for. This can take its toll on the caregiver thereby reducing productivity over time. One of the most interesting observations at one of the ECD centers was when it was time for lunch. The kids were excited as the caregivers coordinated them from junior classes first, and then the older classes all to pick their plate of food from the kitchen in a single queue. They then return back to their classes where a student is selected to say prayers before they all settle down to eat. It appears to be the routine.

During classes, it was observed that the caregivers follow a specific guide or curriculum to teach the children. And play appears to be a very important aspect of the learning component even though it was observed in almost all of the ECD centers visited that very few of them have standard playgrounds with sufficient facilities. The few that seem to have some kind of play facilities appear to have the old and rough which could also pose some level of danger to the children without adequate monitoring. In the classes, very few toys are available, and one of the teachers mentioned that as a result of inadequate play facilities, they resort to other creative ways to engage the children in fun activities. It was also observed that in almost all the places visited, there were hardly any special facilities for children with special needs. However, it was also awkwardly noticed that there was hardly any child in any of the centers seen who had any critical form of special need which may deserve some special attention or

care. This made the researcher conclude that it is either there are no children with special cases need (for real) or parents find it hard to enroll their children with special needs in the ECD centers due to one reason or the other. The researcher also noticed that a few of the centers have could be described as kitchen gardens where vegetable crops are grown. The idea is two folds – to teach parents how to create similar gardens at their respective homes, and also to serve as a complement to the food in the center’s kitchen for the children. The final observation on one of the field trips was the witnessing of a cooking demonstration organized in one of the ECD centers. Parents donated different food materials and the nutrition specialist from the sector office was present to teach the parents how best to combine available basic food materials to make a simple balanced and balanced meal which would be of benefit to their children. In spite of all the above, it is not contentious that an unequal interaction takes place at the different ECD centers between the caregivers and children and between parents and caregivers. But overall, the observations as noted by the researcher did not reveal significant variances or differences amongst the ECD centers but rather it shows how many similarities exist amongst them. The researcher would like to state here that time constraint was a major limitation on this study as this was due to the research period available. Therefore, to obtain a better understanding of practices in ECD centers in future studies, further research, and fewer research methods may be found to be more valuable.

4.1.2 Popularity of the Intervention

Table 11: Comparison Matrix of impact on the domain of Popularity of Intervention

KEQ	Experimental Group	Control Group
Q2.1	100%	19%
Q2.2	100%	19%
Q2.3	100%	0%
Q2.4	98%	0%
Q2.5	98%	55%

Source: Researcher

The general objective of the National ECD policy is to ensure improved quality and equal access to ECD services by all intended beneficiaries in a clear, coordinated and sustainable

manner (Ministry of Gender and Family Promotion, 2016). From the study, it is obvious that this objective is still a long way from being attained. With respect to the level of popularity of the ECD centers in the communities of interest as shown in Table 11, the experimental group confirmed an excellent level of awareness with over cumulative 98% (*High performance*) in strong affirmation. The control group, however, indicated the adverse as 81% showed a lack of proper awareness especially in terms of benefits of the intervention. From the control group, only 19% (*Poor Performance*) could relate to the presence and importance of an ECD center. The control group didn't agree at all that the presence of an ECD in their community or the community participating in the intervention has made any significant impact as unfortunately, they do not even have sufficient awareness that such intervention is there. This may largely be due to inadequate sensitization and proper information about the benefits of the ECD program especially in remote parts of communities in Rwanda. 98% (High performance) of the experimental group confirm that they are pleased with the presence of the ECD center in their community. Hence, *a dire need for improvement in the sensitization strategy* is necessary so as to ensure wide public awareness and acceptance of the program. This will, in turn, improve significantly the extent of responsiveness and number of program beneficiaries. In spite the above report, in an informal conversation with two community leaders from Murama village (Kabuye Cell) and Taba village (Gasumba Cell), the leaders somewhat disagreed with report from the control group by saying that the local administration try as much as possible with the support of the various community leaders to sensitize the people on the ECD intervention and the benefits it offers. They further confirmed that information is usually shared during different community meetings.

4.1.3 Children Enrolment

Table 12: Comparison Matrix of impact on the domain of Children Enrolment

KEQ	Experimental Group	Control Group
Q3.1	98%	90%
Q3.2	98%	0%
Q3.3	100%	100%
Q3.4	100%	0%
Q3.6	98%	3%

Q3.7	95%	98%
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Source: Researcher

Cumulatively, over 90% (*High Impact*) of the respondents in the experimental group agreed to the fact that the availability of school feeding programs, positive and active attitude of parents, non-fee payment and a clean, safe and secure environment contribute immensely to the decision to enroll their children in the ECD centers. As depicted in Table 12 in the control group, the responses are somewhat split as we have also over 90% (*High Impact*) who also attested to the fact that school feeding program, free tuition and clean, safe and secure learning environment are high-quality determinant for the enrolment of a child at an ECD Center. The other split in the control group believed that parent attitudes, caregivers' qualifications, and the availability of facilities for special needs children are not strong determinants for enrolment. An interesting observation from this KEQ domain with the experimental group is that 3% (*poor performance*) even though very low, confirmed the need for some form of provision for special needs children while 97% said that such facilities for special needs children should not be a determinant for enrolment at the ECD centers. Overall, the school feeding program and non-payment of fees has a *high quality impact* on enrolment of children, hence they must be sustained. This was further buttressed by conversations that the researcher had with 2 head teachers and 4 caregivers at different locations. They all emphasized that these two main elements are the core motivating factors that are used to compel parents to enroll their wards in the ECD centers. However, it is observed that children with special education needs are *poorly impacted* as hardly any special facilities were available for their use in any of the centers. This is an area that calls for urgent attention if impact is expected to be expanded.

4.1.4 Learning Approach

Table 13: Comparison Matrix of impact on the domain of Learning Approaches

KEQ	Experimental Group	Control Group
Q4.2	97%	0%
Q4.3	100%	0%
Q4.4	98%	0%
Q4.5	98%	0%
Q4.6	98%	0%

Q4.7	98%	0%
Q4.8	100%	0%

Source: Researcher

One of the cardinal points of the 5-year National ECD strategic plan (2016-2021) is the prescription of interventions that support and enhances children’s full sensory-motor, social-emotional, and cognitive-language potential. It also aims to empower parents as key service providers in this regard. The researcher had informal chats with some children outside class hours about the learning approaches in their pre-school. A point that stood out from the conversation is the affirmation from the children that the very friendly approach employed by their caregivers makes it more comfortable for them to learn new things easily.

In Table 13, 97% (high performance) of participants from the experimental group agreed that the ECD centers have a specific curriculum or framework that they work with. 100% (high performance) acknowledged that the learning approach to cognitive development is well designed to support children's development and in their relationship with others. 98% from the experimental group also agree that the intervention helps the children in the area of language development and communication, physical and mental awareness, use of tools and purposeful actions, and in the expression of feeling. The responses from the control group on this domain and the relevant KEQs were obviously very shallow with poor reactions. However, this is understandable because they have no relatable personal experience whatsoever on the impact concerning curriculum or cognitive development of a child as they cannot relate with any ward in any of the centers. Again, this indicates that in as much as the government has put certain constructive policies in place, even more efforts would need to be expended in implementing such policies, especially at the grassroots level to effectively sensitize the people towards behavior change, awareness, and benefits of the intervention.

4.1.5 School Readiness

Table 14: Comparison Matrix of impact on the domain of School Readiness

KEQ	Experimental Group	Control Group
Q5.2	100%	23%
Q5.3	100%	0%
Q5.4	100%	6%

Source: Researcher

From the group of beneficiaries, all of the respondents (100% - High Impact) agree that the ECD program adequately prepares the children for primary education. In addition, while on the field the researcher had the opportunity to also have informal conversations with some of the parents in the group and they further indicated that from previous pieces of evidence they are more confident that their children will perform much better when they graduate into primary school. In the control group, it was difficult for participants to relate to the question of school readiness because they are not beneficiaries. However, as shown in Table 14, 6% confirmed that from testimonies of reliable persons, they also believe that ECD centers help the children prepare much better for primary education because of the smart foundation they acquire from the program. Interestingly, 23% of the control group as well said they believed that ECD centers may significantly prepare a child for primary education. But this positive response was likely as a result of insight they received in the process of casual conversation during the period of research. Overall, even though more resources need to be committed to improving available services and making the services more accessible to the people, it is evident that the ECD program has a *high quality impact* on the child's academic development and school readiness for further education.

4.1.6 Improvement in Parenting Practices

Table 15: Comparison Matrix of impact on the domain of Parenting Practices

KEQ	Experimental Group	Control Group
Q6.3	97%	0%

Source: Researcher

Table 15 indicate that 97% (*high impact*) of respondents in the experimental sample agree that the programs and activities at the ECD centers tailored at parents on how to support their children's physical, emotional, social, physical and cognitive development have significantly improved their parenting abilities. The goal is to be able to support the child through a responsible development process. Since the control group does not have any interaction at this level with an ECD center, the response rate on this KEQ indicated '*poor*' expectedly as they could hardly relate to such experience.

The other part of the domain is the dichotomous questions as also responded to by the experimental group. 96% (*high performance*) of the respondents in the experimental group also believe that the program staffs encourage and provide support for parent/teacher communication. 84% agreed to participate in some form of activities or events organized for parents at the centers while 16% do not participate in such enhancement activities. If they practice what they learn from these activities, 95% (*high impact*) testified the same with respect to involvement in children's educational activities. From the strategic plan angle, the idea is to intimate parents with skills to support the literacy of their wards, and as well as socialization and early stimulation. Therefore, we can infer that the intervention produced a *high-quality impact* with respect to parenting practices. This does not mean perfect as there is still room to improve especially with respect to reaching out to other people in the community like members of the control group.

4.1.7 Program Scale-up

Table 16: Comparison Matrix of impact on the domain of Scale-up of Intervention

KEQ	Experimental Group	Control Group
Q7.2	98%	100%
Q5.3	97%	100%

Source: Researcher

If there is any point where we have an excellent convergence of agreement between the experimental and control group, it is on the fact that the caregivers who work as volunteers at the ECD centers should be remunerated for their services and that training be provided for teachers at regular intervals. A massive 98% and 100% from both sample groups respectively supported the stand on remuneration for caregivers while 98% and 100% agree from both groups respectively agree with the provision of regular training for teachers and caregivers. The effective motivation of caregivers through adequate financial compensation will go a long way in the success of the intervention.

97% of the experimental group supported the provision of some form of regular feedback to parents or families about their ward's progress. And also, the group reiterated the importance

of putting in place a periodic evaluation mechanism like the study. The response to the interest of having this kind of mechanism was 100%.

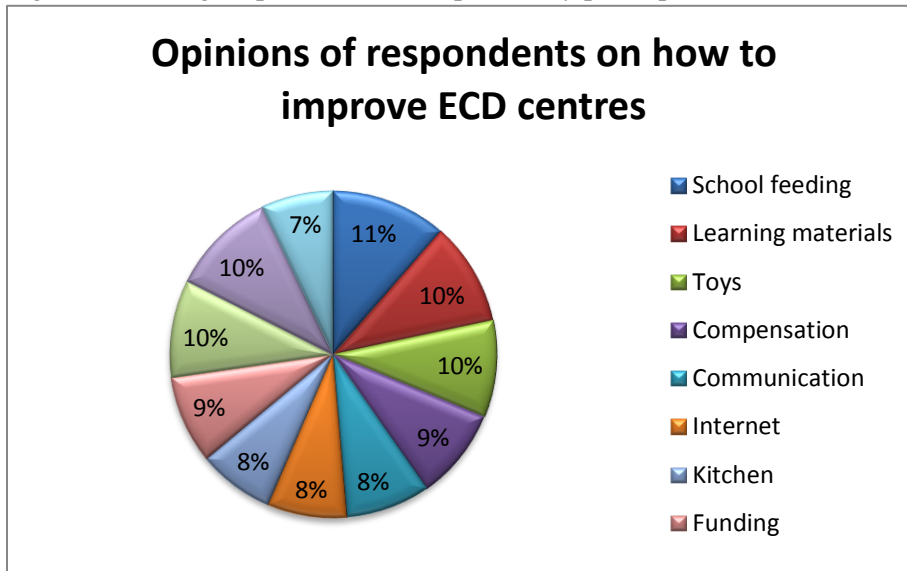
The **various opinions** by the participants also helped shed more light on the way forward in order to improve the services provided by the ECD centers. One of the most important suggestions of the respondents is that the continuation and improved school feeding program will continue to attract parents to bring their children for enrolment. The participants also shared that more learning materials and toys for play and learning should be increased. And also, they advocated that the volunteer caregivers should be put on a steady payroll so as to serve as motivation for better service provision. To reach those who are yet to be beneficiaries, the respondents called for a systematic and sustained sensitization in the communities and further suggested an increased number of model ECD centers across remote communities as well.

Table 17: Proportion of opinions by participants

	Suggestions	No of Responses	Proportion (in degrees)	%
1	Continue School Feeding Program	121	41.2	11.4
2	More Learning Materials	108	36.8	10.2
3	Provide Toys Play and Learning	101	34.4	9.6
4	Adequate Compensation for Caregivers and Teachers	96	32.7	9.1
5	Improved Communication with Parents	88	30.0	8.3
6	Internet Provision	83	28.3	7.9
7	Kitchen	80	27.2	7.6
8	Increased Funding Partners or Sponsors	92	31.3	8.7
9	Increased Standard Formal ECD Centres	102	34.7	9.6
10	Improved sensitization for attitude/behavior change	111	37.8	10.5
11	Other suggestions	75	25.5	7.1
		1057	360	100

Source: Researcher

Fig 15: Percentage representation of opinions by participants



Source: Researcher

4.2 Concluding discussion

A point to bring to note here is that the purpose of this was to evaluate the impacts of ECD centers as an intervention and then identify recommendations that can help fill gaps discovered. The study investigated two different groups of those who in one way or the other have benefited from the intervention and those who are not beneficiaries. The results of the findings were compared in order to identify grey areas regarding the intervention which then led to the succeeding recommendations. Below, the results are discussed in full consideration of the KEQs with references to the Rwanda ECD Policy (2016) “*Uburere buruta ubuvuke*” and the National ECD Policy Strategic Plan (2016-2021) documents, and by confronting these with some existing theoretical models as documented earlier in the literature review of this work.

The theoretical perspective on cognitive development discussed in chapter two assumed that typical cognitive development refers to expected gains in language, thinking and understanding all of which incorporates intelligence, numerical ability, memory, problem-solving, literacy, learning ability, literacy, cognitive control and academic attainment (Rao et al, 2014). The global report on pre-primary education by UNICEF (2019) showed that about 78% (8 in 10) children are missing out on quality early childhood education and care. This

failure does reduce the chances of holistic development and likely success later in life. The impact of ECD programs establishes the promise for the well-being of the child, the family and the community at large. And as observed from the study, there is no perceived evidence to show how the ECD centers may have failed in providing services to the populace. The CRC and the UNDHR recognize access to education as a basic right (King & McGrath, 2002). Mansaray (1991) posited that the accelerated development of societies in Africa largely depends on the level or extent to which quality education is made available and accessible to as many people as possible. Unfortunately, the study showed that a lot is still needed to be done especially at the grassroots level, not only to provide standard ECD centers where children can have access to quality early childhood education and care but also in the area of public education and sensitization towards proper awareness of such interventions in the community.

No singular factor can be said to be the only determinant for the enrolment of a child at an ECD center. However, the role of parents cannot be overemphasized in the decision to enroll a child. And again, this decision is further dependent on factors such as how much value parents put on education and development of their children, how far are they aware of the opportunities provided by the intervention, how much knowledge do they actually have concerning early childhood development and care and concerning their rights as parents. It is to this end that Fineman and Worthington (2009) shared that the rights of children cannot be fully discussed in the absence of discussions of the rights of the parents. The CRC recognizes that it is expedient to strengthen the rights of parents in order to also strengthen the rights of children. Also, according to Yamada (2007), the choices that parents make concerning their children's academics may not always be mainly educational but could also be social or economic as well. Poverty is also an influential element in determining the enrolment of a child for pre-primary education. In most rural communities like Maraba sector where the study has taken place, the poverty level is very high as most families live below the poverty level and thereby exposing their children to environmental and psychosocial challenges unlike children from wealthier homes (Crockett & Haushofer, 2014). This will obviously be the case for many children of parents from the control group who do not have access to the intervention. Their growth and development are more likely to be hampered (Shonloff et. al,

2012). Early development opportunities establish a critical foundation for children's academic success, health and general wellbeing (VanLandeghem, Curgins & Abrams, 2002). Hence, the design of an all-inclusive quality early childhood development program should cater for the enhancement of cognitive and socio-emotional capabilities of preprimary children. Further, the intervention should be in such a way that children from poor or disadvantaged homes or communities must also benefit without making them feel inferior or in the face of any discrimination. And this is where the recommendation to maintain the free-fees and the school feeding programs for the ECD centers remains important elements to improve enrolments.

The learning approach as an instructional methodology impacts positively on the children's cognitive development. The employment of a standard curriculum as a part of the Rwanda ECD Policy (2016) "Uburere buruta ubuvuke" and the National ECD Policy Strategic Plan (2016-2021) and under the guidance of the Ministry of Education and NECDP ensures rich academic content and opportunities for the holistic development of children. The existing curriculum includes both academic activities and play. At this stage of a child's life, the development of the brain is faster than any other stage in life (Woldehanna, 2011). The availability of a standard curriculum not only serves as a proper guide for caregivers and a significant factor in ensuring program quality but also as a very important element for the cognitive development, emotional and language development of the child. According to Cunha et. al, (2006), this period of development lays the foundation for lifelong learning of skills and attitude for the child. Woldehanna (2011) on his part further stressed that education learned at one stage is an input into the learning process of the next stage, implying that skills are self-reinforcing, and also Woessmann (2006) and Carneiro & Heckmann (2003) shared that investment in one stage directly improves development at that stage and also indirectly positively impacts development and or productivity at later stages.

One of the core accomplishments, as observed from the ECD centers, is the successful transition of children from one stage or class to the next. And this easily translates into a high probability for school readiness and entrants into primary school. The attestation from parents whom the researcher had informal conversations with showed that there is a significant level of satisfaction on the progress made by their children as the steadily

graduates from one class to the next. The prospects of being very prepared upon entry into primary school further grounds the foundation of how well a child will successfully accomplish his or her future educational capabilities. However, the reverse will be the case for a child that lacks the preparedness that ECD centers offer as that child will most likely be faced with the risk of falling behind. According to Justice et al (2007), underdeveloped skills in reading, language, and social-behavioral competence are indicators of predicting poor future academic performance. This indicates that the opportunities provided by early learning, proper brain development, and overall health are essential for a child's lifespan development. Janus & Duku (2007) reiterated that having school readiness skills is not an attribute that suddenly happens, rather it is the outcome of a child's development at a certain point. Upon entry into primary school, the expectation is that children will have some level of self-regulation, sustained behavioral inhibitions, positive interpersonal relationship with peers and teachers, carry out goal-oriented activities, possess sound physical health and have basic cognitive skills in language, math and reading (Bierman et al, 2008; Kagan, 1990)

The outcome in this study shows that there is a significant level of improvement with parenting practices and with respect to their involvement with their children's educational activities. This comes about as a result of the periodic interaction of the caregivers with the parents on the status or performance of their wards. Also, the parents are often enlightened through the cooking demonstration meetings on other areas of parenting practices such as playing with their children, nutrition and proper hygiene, environmental sanitation, and child healthcare. And the parents attested to the fact that the knowledge acquired through these forums have proven invaluable in the development of their children.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The purpose of the study was to weigh the impact that ECD centers have as an intervention in Huye District of Rwanda with focal attention on Maraba sector. The idea was to organize a comparative study where those who have benefited from the intervention are compared with those who are not beneficiaries. The comparison is then done as the participants provide answers to certain KEQs. These KEQs were collected in different subdomains of RQs using the 5-point Likert scale response, and then they are analyzed in order to determine the level of impact. The system of analysis adapted from Al Rubaish (2010) helped to grade the results into 3 categories of impact level or impact where score above 80 are regarded as High Quality or Excellent, below 80 but above 60 is regarded as Acceptable Impact or Good while scores graded below 60 are regarded as haven performed Poorly and Need Improvement.

The communication of the findings was to provide a resource for the ECD sector for reference and also provide some recommendations to the community, stakeholders and the

government where hopefully they can help in filling identified gaps from the study. Though the findings are indicative rather than sacrosanct conclusions because there is still room for further research, it is hoped that a few lessons can be identified for further improvement of program results.

The fact that there are existing national ECD policies and strategic plans does not automatically translate into successful program implementation. These national documents are designed as guides or pathways to the implementation of programs. The real work is in the application of the policies up to the grassroots levels and the possible flexibility and adaptation of these policies to meet the prevailing situation or need. For example, the Government of Rwanda has done well in creating these documents, however, there is need to commit more resources than what is currently available, increase grassroots sensitization to raise better awareness of the program and commit more efforts towards attitudinal change, improve the welfare of caregivers and provide training to ECD teachers on modern skills. In addition, there is a need to engage new partners, especially from the organized private sector.

The researcher believed that findings from the study have generated concerns that can be put on a pedestal for further study and probably with other research methodology so as determine how some of the recommendations and suggestions in the study can be facilitated. Another instance looking forward is to conduct a similar study but on a larger scale so as to come up with more vigorous pieces of evidence in the not too distant future.

With respect to the KEQ on the popularity of ECD interventions, it is obvious that a substantial number of the people are somewhat aware of the program. However, what needs to be done is to direct more efforts and resources at grassroots sensitization and especially for attitudinal change. The study also revealed that in order to maintain or improve enrolment, the school feeding program is a good attraction, and the non-payment of school fees is a ready-made plus. The learning approaches of the ECD centers must be attuned to the national curriculum and in accordance with the intentions of the national ECD policy and strategic plan. Effective monitoring would ensure a high-quality impact. The general consensus on school readiness is that the ECD intervention gives the child better leverage on readiness and smooth transition into primary school with the benefit of physical well-being and motor development, social and emotional development, cognitive/language development, self-help

skills, and general knowledge. And in order to involve parents more in the growth and development process of their children, there is the need to engage them in particular activities in the program. These activities are those which equip them with the relevant skills to properly interact with their children and other areas such as health and nutrition.

5.2 Recommendations on the way forward

The intention here is not to produce instructions for policy and practice for ECD centers in Rwanda, rather the objective is to make certain recommendations on the way forward as observed from the study, and this includes:

- With respect to awareness of ECD interventions and the attitude of parents towards ECD programs in the various communities, effective communication, and continuous sensitization and education should be engaged in order to reach the people especially at the grassroots level.
- To maintain interest and improve enrolments at ECD centers, the school feeding program must be sustained and the introduction of school fees must be discouraged.
- The volunteer caregivers who form part of the workforce at the ECD centers should be adopted into the workforce of the local government and thereby adequately compensated for their services.
- Provision of periodic training for all the different levels of personnel of the ECD centers.
- Adapt facilities and services for children with special education needs at the ECD centers, and create modules/content in the teacher training programs that specifically target negative attitudes towards children with special education needs.
- Ensure the periodic operational monitoring of program delivery especially in relation to the effective use of the program curriculum.
- Create awareness programs in rural areas to sensitize communities on the rights of children and especially with respect to early childhood development.

- The government should initiate the creation of a Trust Fund specifically dedicated to servicing ECD in Rwanda
- A system should be created where students from colleges of education or education faculties in higher institutions should spend some time (minimum of 3 months) under their industrial training or attachment at ECD centers.
- Human interest stories may be created from success stories from the ECD centers which can then be used for public campaigns and sensitization at the communities.
- A feedback mechanism should be created at the community level where parents have the benefit of obtaining firsthand reports on the progress of their children and they can also share their opinions.

5.3 Implications for Action – A Holistic Rights-Based Approach

There is the need for a change in the way the rights of a child are viewed from Needs to a Rights-based perspective as this will help the government to explore a different approach to policy and strategic plan formulation and their implementation as well. For example, the need approach will accept that “80% of all Rwandan children aged 0-6 have had their ECD needs to be met as beneficiaries of the intervention.” The human rights approach, however, will show 20% of all Rwandan children of the same age have not had their ECD rights satisfied to participate in the intervention. The focus is to “improve what is done rather than how it is done”. Therefore from a Rights perspective, the view would be that the government has fallen short in its duty to ensure the rights of the child for ECD interventions.

In the best interest of the child, ECD Programs or interventions should be based upon knowledge and understanding of the human rights and situation of children. A thorough situation assessment and analysis from rights perspective will lead to an understanding of the combination of causes that together prevent some children from enjoying their rights. Program Goals and objectives must be set in terms of fulfillment, protection, and respect for children’s rights in both outcome and process. The strategies and activities selected at each level of society, from household to national level, should be the most efficient and effective

in building individual and institutional capacities to fulfill obligations to children and women. And the place of evaluation, research, and other related learning methods cannot be over-emphasized in a human rights approach.

According to a presentation A Rights Perspective on Early Childhood (UNICEF, n.d), A rights-based approach to ECD programming requires building an integrated and inter-sectorial wide range of partnerships and alliances for children. It allows the participation and empowerment of children and families and further focuses on sustainable results for children.

5.4 Limitations and future research

The researcher experienced several limitations in this study. First, coverage of the study was limited to 1 district out of the 30 districts across Rwanda. Then there was the challenge of sample selection from the 31 villages that make up the 6 cells of Maraba sector. The sample had to be drawn in order to at least have a fair representation of the 6 cells. The usual operation is to collect data from several independent samples so in order to also be able to perform cross-validation on the results (Floyd & Widaman, 1995). In order to strengthen his study, the researcher first grouped all the 31 villages in their respective clusters of cells and from each cell a random village was selected to make up fair representation for both the experimental and control groups for the study. At this point, the researcher would like to suggest that further study could aim at a wider population of interest so as to derive more valid evidence and increase the generalizability of the findings.

Another limitation resulted from the language barrier. The poor comprehension of Kinyarwanda by the researcher affected the ability to directly collect data. To solve this, two competent data collectors were hired for the purpose of collecting data from identified sources. The data collectors were trained by the researcher on the specific needs of the study.

The bureaucracy and length of time it took to get approval from the district office was quite stressful. Also, obtaining data and other relevant research information from this office was a daunting task. But in spite of the challenges, the efforts, and support of the executive

secretary of Maraba sector helped to overcome the foreseen obstacles especially with respect to data collection and field visits.

A number of diverse social researches have shown that the early years are critical in the development of intelligence, personality, and social behavior.

A point to note here is that this study is not considered as a *fait accompli* but rather provides a foundation for further research on the subject matter or related theme. So, concerning future study, the researcher intends to further investigate and improve on adapting Al Rubaish (2010) analytic technique from the Student Experience Survey (SES) for future Program Impact Evaluation Survey (PIES) in order to produce better impact evaluation results.

The researcher expects that future research would explore individual ECD centers as a program intervention for critical study in order to determine certain peculiarities that permit particular desirable impact, especially in common communities. The takeaway from such a study will be invaluable for similar programs or centers to learn from. Accordingly, each intervention constitutes a different environment. This suggests the need to carry out impact evaluation studies in each beneficiary center.

Also, there is future research opportunity in the impact evaluation of home-based ECD centers in comparison with the impact of the center-based ECD. Even though there seems to be some form of existing links between the operations of the two types of ECD interventions, the study will help to generate results that could be valuable in determining resource allocation and further scale-up.

The researcher hopes that the opportunity to conduct an evaluation of change in the ECD program over time will help determine whether or not progress is being made in improving outcomes over time using the adapted work of Al Rubaish (2010). As indicated by Hertzman (2006) clear evidence of positive change will show

- an upward shift in the distribution of individual EDI scale scores across an entire region,
- increasing average scores across the vast majority of communities within a region,
- decreasing inequality in average scores among these communities,

- decreasing proportions of vulnerable children in the vast majority of communities,
- decreasing inequality in the proportion of vulnerable children among these communities.

Conversely, the reverse will signal clear evidence of negative change.

To conclude, the researcher brings to fore an excerpt from the Convention on the Rights of the Child (CRC, 1989) adopted and opened for signature, ratification, and accession by General Assembly resolution 44/25 of 20 November 1989; *entry into force* 2 September 1990, in accordance with article 49

...convinced that the family, as the fundamental group of society and the natural environment for the growth and well-being of all its members and particularly children, should be afforded the necessary protection and assistance so that it can fully assume its responsibilities within the community,

Recognizing that the child, for the full and harmonious development of his or her personality, should grow up in a family environment, in an atmosphere of happiness, love, and understanding,

Considering that the child should be fully prepared to live an individual life in society, and brought up in the spirit of the ideals proclaimed in the Charter of the United Nations, and in particular in the spirit of peace, dignity, tolerance, freedom, equality, and solidarity,

Bearing in mind that the need to extend particular care to the child has been stated in the Geneva Declaration of the Rights of the Child of 1924 and in the Declaration of the Rights of the Child adopted by the General Assembly on 20 November 1959 and recognized in the Universal Declaration of Human Rights, in the International Covenant on Civil and Political Rights (in particular in articles 23 and 24), in the International Covenant on Economic, Social and Cultural Rights (in particular in article 10) and in the statutes and relevant instruments of specialized agencies and international organizations concerned with the welfare of children, '

Bearing in mind that, as indicated in the Declaration of the Rights of the Child, "the child, by reason of his physical and mental immaturity, needs special safeguards and care, including appropriate legal protection, before as well as after birth",

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http://betterevaluation.org/plan/describe/collect_retrieve_data

<http://www.oecd.org/dac/evaluation/dcdndep/37671602.pdf>

<http://www.worldbank.org/children/devstages.html> adapted from
<http://www.worldbank.org/children/braindev.html>

<http://www.worldbank.org/hidden.devstages.html>

<https://ec.europa.eu/jrc/en/research-topic/counterfactual-impact-evaluation>

<https://jech.bmj.com/content/jech/71/3/217.full.pdf>

<https://openknowledge.worldbank.org/bitstream/handle/10986/15900/WPS6540.pdf?sequence=1&isAllowed=y>

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https://www.betterevaluation.org/en/rainbow_framework/understand_causes/compare_results_to_counterfactual

https://www.sas.com/en_us/insights/big-data/data-visualization.html

<https://www.st-andrews.ac.uk/media/capod/students/mathssupport/Likert.pdf>

www.worldbank.org/ieg/nonie

Annex 1: General Questionnaire on Early Childhood Development (ECD) Center

SECTION 1: PERSONAL INFORMATION

S/No						
1.1	Sector:			Village:		
1.2	Household Identification Number:					
1.3	Telephone contact: 1.			2.		
1.4	Name of Respondent:				Sign/Date:	
1.5	Main Occupation:					
	Teacher	Farmer	Artisan	Business	Civil Servant	Others
1.6	Marital Status:	Single	Married	Divorced	Widowed	Others
1.7	Relationship to Child:					
1.8	Highest Relevant Qualification:					
	Postgraduate	Bachelor	Teachers Training	High School	Primary	No School
1.9	Name of ECD Centre:					
1.10	Role	Administrator	Teacher	Caregiver	Child	Other
1.11	Years at facility	Less than 1 Year	1 to 3 Years	4 to 6 Years	6 to 8 years	7 or more Years
1.12	Sex/Gender	Male:		Female:		
1.13	Age Bracket	0-10 Years	11-20 Years	21-30 Years	30-40Years	40 - Above
1.14	Researcher:					

LIKERT SCALE KEY

5	4	3	2	1
A Very Large Extent	Large Extent	Uncertain	Small Extent	Very small Extent
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

SECTION 2: POPULARITY OF INTERVENTION

	5	4	3	2	1
2.1 To what degree are you aware of any ECD Centre within your community?					
2.2 In your view, how much do you agree or disagree that attending ECD Centre is important for a child?					
2.3 Has the presence of an ECD Centre in your community made any significant impact in the community?					
2.4 Do you agree that community participation significantly impact the success of the ECD Centre?					
2.5 In your opinion, to what extent do you think the community is pleased to have an ECD Centre?					

SECTION 3: CHILDREN ENROLMENT AT ECD CENTRES

	5	4	3	2	1
3.1 To what extent would you say school feeding program affects enrolment at the ECD Centre?					
3.2 Do Parents attitude affect enrolment of children at the ECD Centre?					
3.3 To what extent do you think fees could affect enrolment of children at the ECD Centre?					
3.4 To what extent would you say teachers' qualification affects enrolments at the ECD Centre?					
3.5 Do you have facilities for children with special needs? 1. Yes 2. No (Probe response)					
3.6 To what extent does the availability of facilities for children with special needs affect enrolment at the ECD Centre?					
3.7 How much do you agree or disagree with a clean, safe and secure environment as a determinant for enrolment at the ECD Centre?					

SECTION 4: IMPACT OF LEARNING APPROACHES ON COGNITIVE DEVELOPMENT

	5	4	3	2	1
<p>4.1 The ECD Centre has a specific curriculum or framework</p> <p>1. Yes 2. No (Probe response)</p>					
<p>4.2 To what extent would you say the early childhood program at the ECD Centre is designed to support children's development in Self-awareness</p>					
<p>4.3 How much do you agree or disagree that the ECD program is designed to support children's development in the areas of Motor and Eye-Hand Skills</p>					
<p>4.4 The ECD program is designed to support children's development in the areas of Language Development/ Communication. How much do you agree or disagree?</p>					
<p>4.5 To what extent is the ECD Centre program designed to support children's development in the areas of Physical, and Mental Awareness</p>					
<p>4.6 How much do you agree or disagree that the ECD program at the Centre support children's development in the areas of Purposeful Action and Use of Tools</p>					
<p>4.7 The ECD Centre program is designed to support children's development in Expression of Feelings. How do you agree or disagree with the statement?</p>					
<p>4.8 Would you agree or disagree that the ECD program is designed to support children's development in the areas of Interest in Others?</p>					

SECTION 5: SCHOOL READINESS FOR P1

	5	4	3	2	1
<p>5.1 Would you say that the ECD Centre have positive impact on a child’s academic development? Explain more</p> <p>1. Yes 2. No</p>					
<p>5.2 How much do you agree or disagree that the ECD Centre significantly prepares a child for primary education?</p>					
<p>5.3 To what extent are the final class students happy to graduate into primary school?</p>					
<p>5.4 As a parent, do you agree and have confidence your child will perform better in primary school compared to if your child did not attend any ECD Centre?</p>					

SECTION 6: IMPROVEMENT IN PARENTING PRACTICES

	5	4	3	2	1
<p>6.1 The program's staff encourages and provides support for parent/teacher communication</p> <p>1. Yes 2. No (Probe response)</p>					
<p>6.2 Do you participate in the activities organized for parents at the ECD Centre?</p> <p>1. Yes 2. No (Probe response)</p>					
<p>6.3 How much do you agree or disagree that the activities at the ECD Centre have significantly improved your parenting abilities?</p>					
<p>6.4 Do you create time to play with your child/children at home?</p> <p>1. Yes 2. No (Probe response)</p>					
<p>6.5 Do you practice what you learn from these activities on how to involve in your child/children education activities? How</p> <p>1. Yes 2. No</p>					

SECTION 7: SCALE-UP OF ECD CENTRES/PROGRAMS

	5	4	3	2	1
<p>7.1 Regular feedback is provided to families about their children's progress and program activity.</p> <p>1. Yes 2. No (Probe response)</p>					
<p>7.2 To what extent should volunteer caregivers be remunerated for their services at the ECD Centres?</p>					
<p>7.3 Do you agree or disagree that regular training be provided for teachers at the ECD Centres?</p>					
<p>7.4 Would you like to have this kind of evaluation at periodic intervals? Reasons</p> <p>1. Yes 2. No</p>					
<p>7.5 Kindly 3 things that can be done to improve the ECD Centres</p>	1		2		

Annex 2: ECD Questionnaire Consent

SECTION 1: INTRODUCTION AND CONSENT

Hello. My name is Ayeni Solomon Ayodele. I am a Postgraduate Student of Development Studies at the University of Rwanda, and I'm working on a research on the "Impact Evaluation of Early Childhood Development (ECD) Centre in Rwanda". The overall purpose of the research work is to evaluate the impact of ECD Centre in Rwanda considering the efforts of the Government of Rwanda in collaboration with other relevant stakeholders by answering questions of whether the program is working or not, identify gaps and hence assist with recommendations of improving the early childhood program where necessary. The research takes Huye as a case study and with specific attention on Maraba sector and Ngoma sector considered for the survey. You may not identify yourself except you want to be contacted for further information. Kindly answer the questions related to ECD Centre in your community.

Kindly note that there is no right or wrong responses as the researcher would appreciate that you feel free to express yourself. Participation in the survey is voluntary and you can choose not to take part. If you have any question please feel free to ask otherwise if you accept to participate please sign below.

Signature: _____

(Your signature means you have understood and accepted to participate in this survey.)

Date: _____