

The Application of Fuzzy Comprehensive Evaluations in the College Education Informationization Level

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Abstract: Curriculum implementation entails putting into practice the officially prescribed courses of study. Effective curriculum implementation results in both short and long term benefits to children. The study was designed to investigate the implementation of Early Childhood Development and Education (ECDE) curriculum in Early Childhood Development (ECD) centres in Turkana County, Kenya. The data was collected and analyzed using descriptive statistics. Results from data analysis had revealed that the majority of the ECDE centres in the sub-county did not have adequate physical facilities and teaching-learning materials. The study also established that majority of the ECD Centres did not have feeding programmes and teacher-pupil ratio was very high and was having a negative effect on the implementation of the ECDE curriculum. As a result of the study findings it was recommended that the County Government should construct more classrooms, support the ECD centres with more thematic materials for making interest corners in class, and provide adequate food regularly.

Keywords: Implementation; Curriculum; Early Childhood Development Centres; Turkana County, Kenya

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I. Background to the Study

Effective curriculum implementation has both short and long term benefits to the child and society like improved nutrition and health, improved cognitive development and school achievement (Glewwe, Jacoby, and King, 2001). It also leads to higher school enrolment, less repetition; reduce social inequality (Myers, 1995). According to Chikumbu & Makamure (2000), effective curriculum implementation is influenced by factors such as the teacher, learner, resource materials and facilities, interest groups, the school environment, culture and ideology, instructional supervision and assessment.

Curriculum implementation entails putting into practice the officially prescribed courses of study, syllabuses, and subjects (Chikumbu and Makamure (2000). Curriculum implementation is also the manner in which the teacher selects and mixes the various aspects of knowledge contained in a curriculum document or syllabus (University of Zimbabwe, 1995). It is also how the officially designed course of study is translated by the teacher into syllabuses, schemes of work and lessons to be delivered to students (University of Zimbabwe, 1995).

Loucks and Lieberman (1983) define implementation as the try-out of a new practice and what it looks like when actually used in a school system. According to Ornstein and Hunkins (1998), curriculum implementation is an interaction between those who have created the programme and those who are charged to deliver it. In US, curriculum is defined as a written plan that is based on materials needed to support implementation of research based curriculum (McLachlan, Flear & Edwards, 2013).

According to UNICEF (2009), many countries in Africa like Botswana, Ethiopia, Kenya, Rwanda, South Africa and Zambia have developed national ECD policies and guidelines to support curriculum implementation. In Tanzania and Ethiopia, UNICEF supported the mainstreaming of ECD centres to increase access to early stimulation for children under the age of three.

In a number of countries in Africa, governments, in collaboration with UNICEF, have promoted access to ECD services by establishing innovative programmes. These include community-based child care centres in Malawi, a rapid school readiness initiative in Kenya, a child-to-child mentoring approach in Ethiopia, and expanding ECD centres to primary schools in Lesotho and Zimbabwe. In South Africa, UNICEF supported a public expenditure study on ECD programmes, the first of its kind in the country. The study tracked funding from its source to the level of service delivery in communities. The initiative produced tools to better target ECD services and increase resources for the sector.

The Government of Kenya has come up with ECD policy framework as a linking correspondence which has comprehensively stated the contribution of parents and other stakeholders in the provision of ECD services. The Government also has operationalized the ECD policy framework by developing ECD standard

service guideline for every stakeholder to observe (Early Childhood Development Framework, 2006) & (Early Childhood Development Service Standard Guideline for Kenya, 2006).

A study by Erden (2010) on the problems that preschools teachers face in curriculum implementation in Ankara found that the problems which were associated with physical facilities experienced by preschool teachers working in public Kindergartens differed significantly compared to teachers working in private preschools. This study seeks to explore the availability of physical facilities in the ECD centres in Turkana County.

Koskei (2013) did a study on Teacher's awareness and ability to implement the ECDE Curriculum in Uasin Gishu County and found that the curriculum was not effectively implemented as it was initially designed and conceptualized which was attributed to lack of clarity and awareness about the curriculum. This study was to find whether facilities and materials were available in ECD centres for curriculum implementation in Turkana County.

Murundu, Indoshi, & Okwara (2010) did a study on school based factors influencing implementation of early childhood development and education curriculum in Kenya and found that lack of suitable teaching and learning resources, inappropriate diet, understaffing, inappropriate medium of instruction, teacher-child ratio and poor grouping practices were some of the factors hindering effective implementation of the curriculum in ECD centres. This study was to find out whether suitable teaching and learning resources, and feeding programme were available in ECD centres in Turkana County.

In a study done by Nyakwara and Ayaga (2014) on teacher-related factors influencing the implementation of Early Childhood Development and Education Curriculum in Borabu Sub-county, Kenya found that many teacher factors hindered effective implementation of the curriculum. The factors included teachers' low academic and professional qualifications; lack of in-service training; low motivation; and negative attitude towards curriculum implementation. This study sought to investigate the ECD Centre related factors influencing curriculum implementation in public ECD centres in Turkana County.

II. Problem Statement

Availability of physical facilities, teaching-learning materials, feeding programmes and teacher-child ratios is very crucial in curriculum implementation. The curriculum that is effectively implemented results in both short and long term benefits to children which includes improved health and nutrition, enhanced cognitive development, high academic achievements, increased school enrolment and reduce repetition as well as reduce drop-outs.

Curriculum implementation entails putting into practice the officially prescribed courses of study or syllabuses. It's defined as a written plan that is based on materials needed to support its implementation. The role of stakeholders in implementation of ECDE curriculum is explicitly defined in the ECD Policy Framework to provide a co-ordination mechanism to parents and other stakeholders in the provision of services. The studies conducted on ECD curriculum implementation did not focus on ECD Centre related factors influencing ECD curriculum implementation but on teacher related factors and child related factors.

Studies have also shown that the ECDE curriculum has not been effectively implemented as planned and conceptualized a scenario prevalent in ASAL areas like Turkana County which means that there are still other factors which are influencing ECDE curriculum implementation. This study focused on ECD Centre related factors influencing curriculum implementation in the ECD centres.

III. Objectives of the Study

This study was guided by the following objectives:

- i) To find out the influence of availability physical facilities on curriculum implementation in ECD centres in Turkana County.
- ii) To determine the influence of availability of teaching-learning materials on curriculum implementation in ECD centres in Turkana County.
- iii) To assess the influence of availability of feeding programme on curriculum implementation in ECD centres in Turkana County.
- iv) To establish the influence of teacher-child ratio on implementation of curriculum in ECD centres in Turkana County.

IV. Research Methodology

The study adopted a descriptive survey design. The dependent variables were: Availability of physical facilities, availability of teaching and learning materials, teacher-child ratio, and availability of feeding programme. The dependent variable was implementation of the curriculum in early childhood development centres. The target population was all ECD teachers in Turkana County which was purposively selected. The sample size was teachers in ECD centres in two Wards in the sub-county. The data was collected through

observation and interview schedules. The validity of the data collected was determined by content validity, while the reliability of the instruments was determined by applying test-retest method. The data was collected and analyzed using descriptive statistics.

V. Results and Discussion

5.1 Availability of Physical Facilities and Curriculum Implementation

The first task of this study was to find out the influence of availability of physical facilities on curriculum implementation in the ECD centres. The researcher did an observation on availability of physical facilities in the sampled ECD centres to determine the availability of physical facilities. The results were shown in the Figure 1 below.

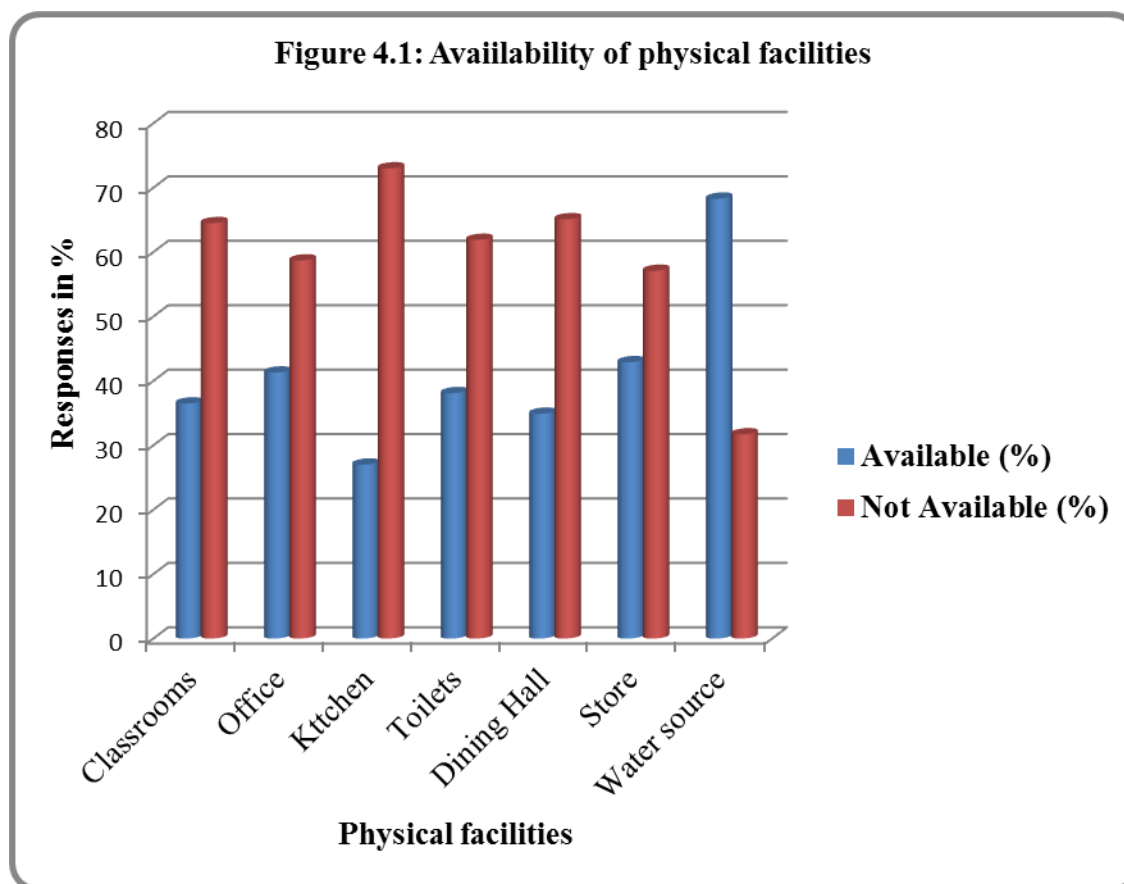


Figure 1: Availability of Physical Facilities

As it can be seen in Figure 1, the majority of the ECD centres did not have basic physical facilities like classrooms, offices, kitchen, toilets, dining halls, stores and water source. From the observations with teachers and head teachers, the ECD centres which did not have toilets at all they were using surrounding areas or bushes. The centres without classrooms children were learning under scattered trees which exposed them to a lot of heat from the sun and dust because the area is arid and semi-arid. The centres without any source of water require children to carry water from home, fetch water from wells which are far away from the centres and hence affecting the security and safety of children. Some of the shallow wells on the riverbed have salty water which is not safe for drinking and because they are also used by both domestic and wild animals. When children travel many kilometers in search of water they get tired and so cannot concentrate in class and hence affecting effective implementation of curriculum in the ECD centres.

During the interview the teachers also reported that some of the problems they encounter while implementing the ECD curriculum were: Overcrowded classrooms; lack of working space; lack of stores for keeping teaching-learning materials and lack of toilets for children. One of the topics in the ECDE curriculum is proper toilet hygiene which is not possible if there are no toilets and water. Teachers also indicated that the ECD centres that had some learning structures and water had classes that are overcrowded because parents could

transfer their children to ECD centres with classes for learning. The results imply that lack of physical facilities in the centres have a negative effect on the implementation of ECDE curriculum. One teacher said:

“Lack of classrooms in the centre has made teachers to teach all children in one class and that makes work difficult and tiresome because the space in class becomes scarce for even walking to children who are in the other corner of the class or who are special in between. A school without classrooms has lower status and it diminishes the morale of teachers and children”.

Another teacher said:

“lack of toilets makes us use the neighboring environment or some of us come to teach prepared psychologically not expecting to go to the toilet or you just expect to go for a short call only in the scattered bushes around,. Water is a problem that requires us to bring water from home, children may fetch from the river that is far making them tired and not able to learn properly, the water is not treated and it threatens the health of children here”.

The findings of this study were in agreement with those reported by Kweyu (2012) who found that there was an acute shortage of classrooms and toilets in public ECDE centres in Mumias District in Kenya. Another study by Koskei (2013) concurred with the findings of this study which had revealed that the ECDE curriculum was not effectively implemented in ECD centres in Uasin Gishu County, Kenya as it was initially designed and conceptualized because of lack of basic physical facilities like classrooms. The findings of this study are in congruence with the findings of the study by UNICEF (2010) in Ethiopia which found that associated facilities, physical conditions as well as services in a greater number of ECD centres were not near from being child-friendly before introduction of Child-friendly Schools program.

5.2 Availability of Teaching-Learning Materials and Curriculum Implementation

The second objective of this study was to determine the influence of availability of teaching-learning materials on curriculum implementation in the ECD centres. To achieve the objective, classroom observation was conducted, and teachers were interviewed and results were as shown in Figure 2 below.

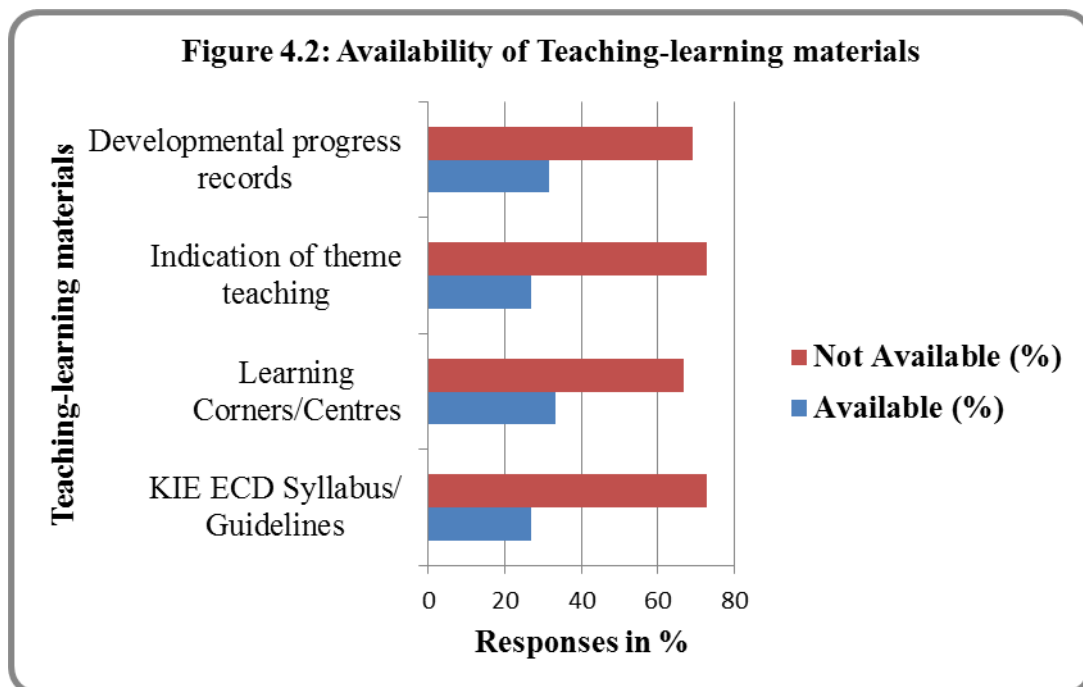


Figure 2: Availability Of Teaching-Learning Materials For Implementing Curriculum

Figure 2 shows that the majority of the ECD centres did not have the basic teaching-learning materials for implementing the ECDE curriculum such as KICD syllabus, learning corners, and progress records. From the observations with teachers, the ECD centres which did not have KICD syllabus at all they were using their course experiences like number activities, language activities, creative and outdoors activities. The ECD centres which did not have learning corners at all had learning materials heaped in one place in class such as animal and number charts. The centres which did not show any theme teaching had learning materials randomly placed in classes. The teachers also mentioned that they lack sacks and manila papers to enable them make more teaching-learning materials. They also noted that parents had not bought crayons for their children to enable the children draw and colour such that there is displays from learners’ assignment in classes. This scenario could not organize the learning according to the themes and the learners could not systemize the subject matter in the

curriculum such as home and family, our school and transport, and the learners had no opportunity to appreciate their own works in classes.

During interview with ECDE teachers it was reported that due to lack of teaching-learning materials in ECD centres teaching-learning was boring, children's attention span was poor, children's understanding was poor and it de-motivates teachers and learners when seems something is lacking in class such as thematically made charts and the syllabus. The results imply that the implementation of ECDE curriculum was not effective due to lack of adequate teaching-learning materials in the centres. One teacher said:

"We don't have KICD syllabus or the guideline and we just use our college course notes to generate whatever we are offering now in class. The classes are small compared to the large number of children in class; the space becomes small even to store some teaching-learning materials since there is no store. Lack of the guideline and lack of support from parents makes us just offer learning activities such as number work and, language only and children mostly do unguided plays since there no sufficient teaching-learning materials for constructing interest corners".

The findings from this study concurs to those from a study by UNICEF (2010) which disclose that the factors contributing to high repetition and low performance were lack of text books and difficult subject matter in ECD centres in Ethiopia.

The findings from this study were also in agreement with those from a study by Indoshi, Murundu and Okwara (2010) who unveiled that lack of suitable teaching and learning resources, understaffing, inappropriate medium of instructions and poor grouping practices were the factors hindering effective curriculum implementation in ECD centres Emuhaya District, Kenya.

The findings of this study are therefore similar to those displayed by Githuthwa (2011) who imparted that registered ECD centres in Lari, Kiambu County, Kenya have a problem of lack of adequate instructional materials, lack of standardized teaching methods and inadequate skilled personnel.

The results of this study are same to those exposed by Takesure, Moses, Christmas, Kudzai & Emily (2013), which reveal that ECD centres at satellite schools in Mwenezi District, Zimbabwe faced serious challenges notably lack of suitable teaching and learning resources such as sacks, manila papers, crayons and pens and books, understaffing, inappropriate medium of instruction and responsiveness of the community.

The findings of this study are related with the results of the study by Bitok, Tonui, Chepsiror and Too (2013) which showed that a majority of ECD centres have inadequate resources and capacities for both human and physical facilities needed to help up the thematic approach implementation in ECD centres in Uasin Gishu County, Kenya. The outcome of this study are identical to the findings of a study by Shaji and Indoshi (2008) which indicated that a majority (91.2%) of ECDE centres in Kenya lacked adequate and quality classroom science materials or equipment.

The findings of this study also have direct proportionality with the results of the study by Ogembo (2012) that disseminated that most ECDE teachers' level of education was considered inadequate to implement the ECDE curriculum. The study also admitted that there was teacher shortage in most of the ECDE centres. Ogembo brought out that limited institutional capacity of ECDE teachers was a hindrance to proper implementation of ECDE curriculum. The researcher however divulged that the quality of the instructional materials was unreliable and inadequate and therefore posed as a significant challenge affecting the implementation of ECDE curriculum in Nakuru Municipality, Kenya.

5.3 Availability of Feeding Programme and Curriculum Implementation

The fourth objective was to assess the influence of availability of feeding programmes on curriculum implementation in the ECD centres. To achieve the objective ECD teachers were interviewed and observations were done to confirm the availability of feeding programmes in the centres. The results were presented in Figure 3 below.

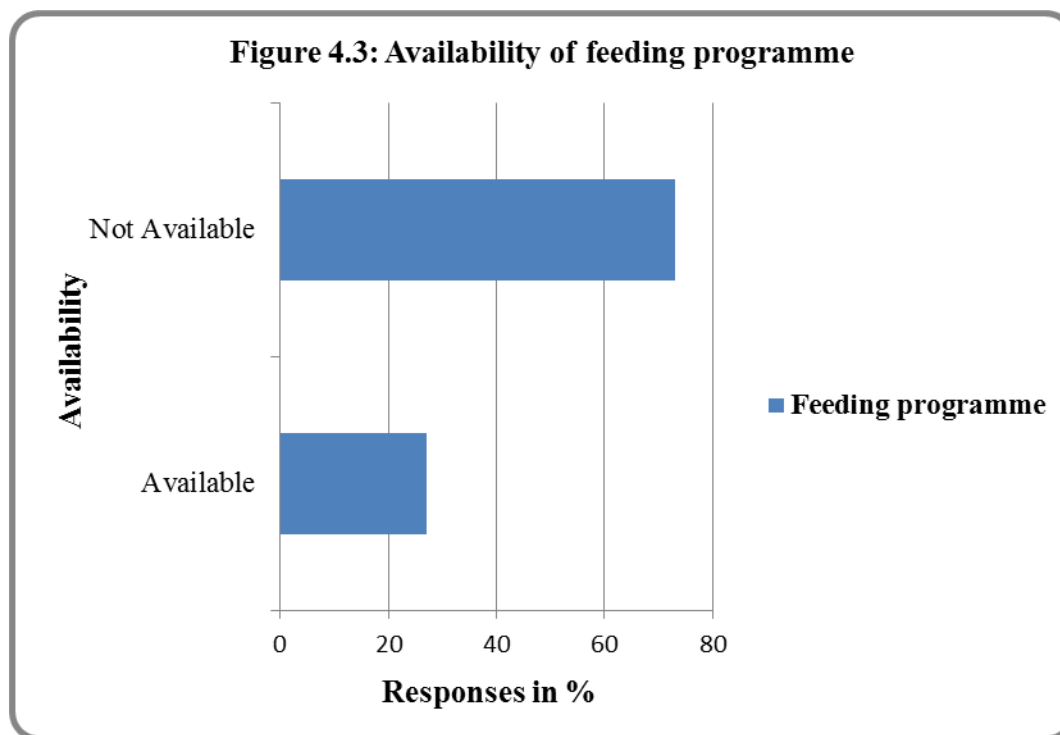


Figure 3: Availability of Feeding Programme in ECD Centres

As shown in figure 3, the majority of the ECD centres did not have a feeding programme. Some of the reasons why there was no feeding programme include: due to lack of adequate and regular support from key stakeholders such as county government, NGOs and parents. The ECD centres were not allowed to charge fees for services offered to finance feeding programme. The majorities of the parents with children in the ECD centres live below the poverty line and are not engaged in farming activities to due to unfavorable climate to enable them to provide support in form of food materials.

The advantages of having a feeding programme include: it increases enrolment of children in ECD centres; improves attention span of children in class; motivates teachers; and increases teachers' productivity when they get meals at school. The other benefits are it improves retention of children in school, increases academic performance as well as enhancing children's smooth transition to the next grades.

Concerning the problems due to lack of feeding programmes in ECD centres, ECD teachers reported that lack of a feeding program perpetuates poor health hence learners do not enjoy the learning process; increases school dropouts; increases distraction of children both in school and in class hence chronic absenteeism; demotivates teachers due to lack of meals at school; the learners opt out of both school and class to look for food hence poor academic performance and decreases concentration both in school and in class. One of the teachers said:

"When there is no food in school, the children cannot learn well, they become sick, do not concentrate in class, they are happy to leave school early to look for food, many children drop out of school when they even lack food from their homes. The ECD centres that are lucky to have food regularly from their sponsors, children flock there because its hope of food first and education after. Most parents are poor, there is no farming taking place like other blessed areas and it is survival for the fittest. The County Government and other stakeholders are the ones depended upon in providing food to ECD centres".

The findings from this study agrees with those found by Githuthwa (2011) which reported that registered ECD centres had a problem of lack of adequate nutrition and health at the ECD centers. This study also has generated results that support findings by Amolo (2004) & Langinger (2011) which points out that there is regular and increased preschools attendance where there is a feeding programme and it makes curriculum implementation possible with the presence of the learners. The findings of this study are similar to the one in School Feeding Programme Training handbook (2006) which regards that the objectives of the School Feeding Programme are to improve the children capacity to concentrate and assimilate information by relieving short term hunger in ECDE children in Kenya.

The findings of this study are greatly indistinguishable with the results exhibited by Mohamed (2012) which unfolded that programs of feeding at the ECD centres have improved enrolment to a greater extent and if the learners are not participating in learning process the effective curriculum implementation will not be

achieved. Mohamed also established that few ECD children absent from school due to lack of feeding program and there were cases of pupils who absent from the centre due to sicknesses, moreover, learners who absent from school centre cause ineffective curriculum implementation. On improved learning at the centres, the researcher established that school feeding program increased children attendance in ECD centres in Bungoma South District, Kenya.

In addition, the findings of this study are comparable to those given out by Chepkwony, Kariuki and Kosgei (2013) which shade light that ECD centres that were offering feeding programme indicated increased academic attainments among ECDE children in Bureti District, Kenya. The findings of this study are homogeneous with results confessed by Munyiri (2010) which put on show that school feeding program improved children's attendance and enrolment in Central Province, Kenya.

5.4 Teacher-Child Ratios and Curriculum Implementation

In the fourth objective, the researcher was to establish the influence of teacher-child ratio on curriculum implementation in ECD centres. This was achieved by determining the teacher-child ratio in the sampled ECD centres. The Republic of Kenya (2006) stipulates the ratio of teacher to children in Early Childhood Development Service guideline as follows: for children 3-4 years is 1:15, and for children 4-5 years is 1:25. The study was targeting the teacher-child ratio of children 4-5 years which qualifies one teacher to less than or equal to twenty-five ($1: \leq 25$) children in one class or standard room of size 8m by 6m. The results were as shown in the Figure 4 below.

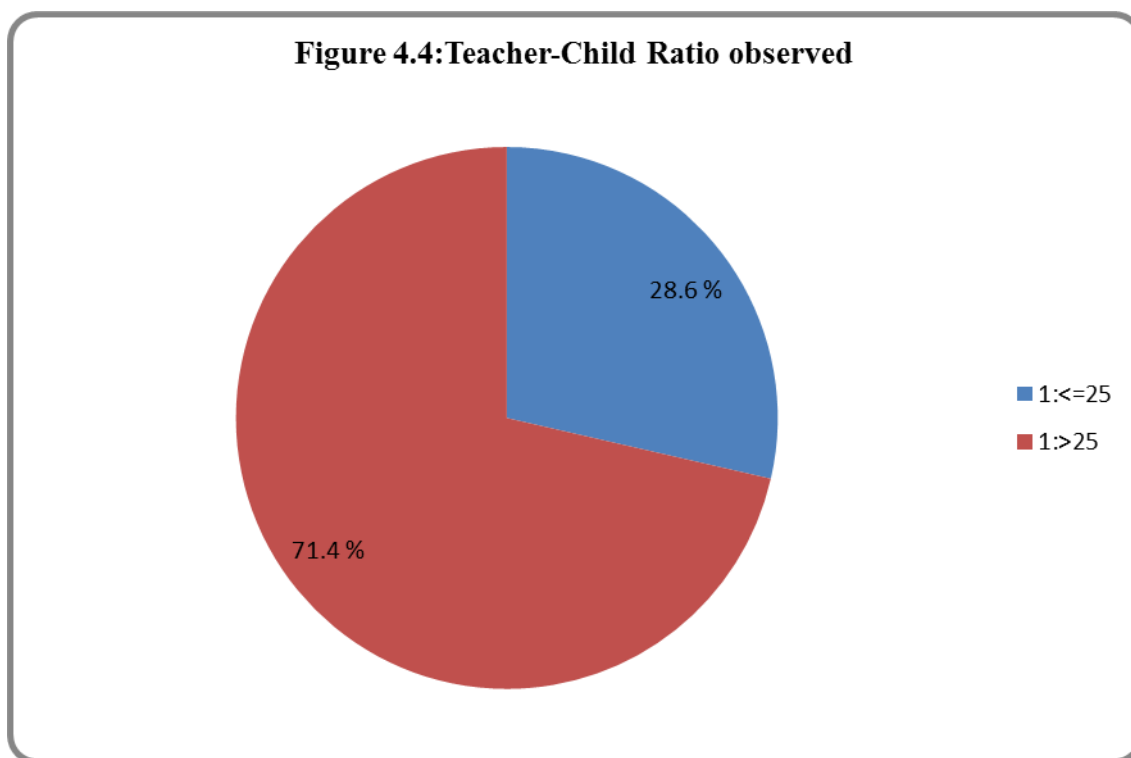


Figure 4: Teacher-Child Ratio in ECDE Centres

Figure 4 shows that more than two-thirds of the ECD centres had more than 25 children to one teacher in their classes. This was due to lack of enough classrooms; few teachers employed; few ECD centres in some areas; and long distance from home to ECD centres hence preferring the ones which are near.

The benefits of suitable teacher-child ratio include individual attention of learners; teacher has time to cater for learners with special needs; and adequate working space for children and teachers. The other advantages include helps children to have smooth transition from one activity to the next; better performance; and hence promote effective implementation of the ECDE curriculum. One teacher said:

“Over expected number of children in class makes the teacher tire to attend to all children including those that require special attention and also lacks time for better preparation for the next lessons. When the class size is of reasonable size the teacher takes it easy to grow attachment to learners in order to help even the weaker children in class. The children who are manageable in class pass their examinations well and they are happy for promotion to the next grades”.

The findings of this study resemble with those reported by Indoshi, Murundu and Okwara (2010) who posited that lack of appropriate teacher-child ratio was one of the factors hindering effective implementation of the curriculum in ECD centres in Emuhaya District, Kenya. The findings also are alike with those from a study conducted by Takesure, Moses, Christmas, Kudzai & Emily. (2013) who unclothed that ECD in Mwenezi District, Zimbabwe faced serious challenges such as lack of suitable teacher-child ratios. The findings are matching with those from a study by Dodge and Colker (1992) who opened up that increasing number of children in classes make teachers uncomfortable to handle with poor remuneration and under the mercy of parents who mostly have little or nothing to give in Washington, US. Piana et al, (2005) did a study and found that ratios have an influence on the classroom and child-teacher interaction quality in Virginia, US. These results were similar to the findings from this study.

The outcome of this study is same proportion as the results of the research by Mupondi-Masuka, Nyika & Kangai (2017) which exposed that teacher-child ratio was as high as 1:50 which was above the 1:20 ratio stated in the statutory instrument 106 of 2005 in Gweru Urban High density Suburbs.

The findings of this study matches the stipulation in the Republic of Kenya (2006) which records the ratio of teacher to children in Early Childhood Development Service guideline as follows: for children 3-4 years is 1:15, for children 4-5 years is 1:25 and for children 5-6 years is 1:30.

VI. Recommendations for Practice and Further Research

As a result of the findings of the study, the following recommendations were made:

7.1 Board of Management (BOG)

To find ways of supplementing the teachers deployed by the Government to their centres by employing BOG teachers. They should also uplift the standard of their centres to attract capable parents to contribute towards feeding programmes, teaching-learning material and towards provision of physical facilities in the ECD centres. This is because the study found overcrowded classes in majority of ECD centres due to lack of teachers and lack of enough classes. The study also found that there was overcrowding in ECD centres where feeding programme is sustainable.

7.2 Teachers

- (i) Teachers can support the alarming shortage of teaching-learning materials in the ECD centres by communicating and engaging the parents to give or buy teaching-learning materials to their children. This is raised because a majority of ECD centres in the study showed cases where parents could not buy books, pen and crayons to their children.
- (ii) The teachers in the ECD centres should pull up their socks to improve academic performance of the children attending the centres to attract parents who are better economically to help in contributing to the development of ECD centres when their children are in those centres. They can easily contribute towards feeding programme if their children are in those centres. The study uncovered that most parents who are taking their children to public ECD centres are not stable economically.

7.3 Parents

- i. Parents should support the construction of more physical facilities in ECD centres for all age groups. This is because the researcher found that the majority of the ECD centres did not have adequate classrooms and toilets. Parents can contribute construction materials such as posts, nails and palm leaves as well as offering for labor; digging pits for latrines and cover them.
- ii. The parents should come in with their tremendous effort to help teachers in bringing and making improvised teaching-learning materials from the local environment. This is as a result of great percentage of ECD centres that did not have adequate teaching-learning materials during the study. The Parents can bring sacks, manila papers, boxes, strings, needle, charts and books or give to their children to take to school for enriching the classes.
- iii. Parents should provide materials for feeding programme which include firewood, offer free labour such as cooking, cleaning, splitting firewood and eating utensils. This is because the researcher found many ECD centres in the study had problem with cooking materials such as firewood and catering utensils as well.
- iv. The parents can also contribute to support some teachers for their children. This is because the study found the children overcrowded in one class due to lack of enough teachers in a great portion of the ECD centres. Some parents have experience in teaching and they can volunteer to teacher or act as caretakers.

7.4 County Government

- (i) To construct enough classes for children of all ages recommended going to ECD centres. This is because the study revealed that a minimal number of ECD centres have one class each constructed by the county Government and the children were crowded in that one class in the centre.
- (ii) To provide adequate food regularly to avoid children and teachers leaving the centre early before time stipulated so that to go for something to eat. This fact is for the reason that a huge percentage of the ECD

centres observed did not have cooking going on for a significant part of the term or even in the whole term of schooling.

- (iii) To employ enough teachers and caregivers to ECD centres. The study shows that most ECD centres observed in the study did not have enough teachers and caregivers hence overcrowded classes that did not give the teacher any time for lesson preparation and time for individual attention of learners.
- (iv) To provide sufficient teaching-learning materials to the ECD centres. This was reached because a lamentable great number of ECD centres observed by this study did not have KID syllabus/guideline, materials for making charts and modeling materials since the teachers interviewed said they were brought to the centre either by the County Government or UNICEF.

Reference

- [1]. Amolo, J.T.H., (2003). School Nutrition Programs in Kenya: Success and problem areas. A paper presented to: Global Nutrition Forum and AFSA Annual National Conference Indianapolis, Indiana USA held on 22nd-28th 2004.
- [2]. Bitok, E., Tonui, B., Chepsior, P. & Too, J., (2013). Resource capacities supporting thematic approach in teaching ECDE centres in Uasin Gishu County. *International Journal of Education Learning and Development* Vol.2, No.5, pp.78-86.
- [3]. Chepkwony, B. C., Kariuki, B.M. & Kosgei, L.J., (2013). School Feeding Program and Its Impact on Academic Achievement in ECDE in Roret Division, Bureti District in Kenya. *Journal of Emerging Trends in Educational Research & Policy Study*, Vol. 4 Issue 3, p40.
- [4]. Chikumbu, T.J. & Makamure, R., (2000). *Curriculum Theory, Design and Assessment*. (Module 13). Vancouver: Commonwealth of Learning.
- [5]. Dodge, D.T., & Colker, L.J., (1992). *The creative curriculum for early childhood* (3rd Ed.). Washington, DC: Teaching Strategies Inc.
- [6]. Erden, E., (2010). Problems that preschool teachers face in the curriculum implementation in Ankara. (Master's Thesis, Middle East Technical University).
- [7]. Githuthwa, H. W., (2011). An investigation into the problems faced in the development of early childhood education in Kenya: a case of Lari, Kiambu County (A Masters Research Project, Kenyatta University).
- [8]. Glewwe, P. H.G. Jacoby & King, E.M., (2001). "Early Childhood Nutrition and Academic Achievement: A Longitudinal Analysis". *Journal of Public Economics*, vol 81 (3), pp. 345-368.
- [9]. Koskei, J. R., (2013). Resource Provision, Stakeholder Attitudes and Support for National Centre for Early Childhood Education (NACECE) Curriculum Implementation in Uasin Gishu County, Kenya. *International Journal of Advanced Research*, Volume 1, Issue 3, 354-361.
- [10]. Koskei, J.R., (2013). Teachers' Awareness and Ability to Implement NACECE Curriculum In Uasin Gishu County, Kenya. *Journal of Emerging Trends in Educational Research and Policy Studies (JETERAPS)* 4(2): 399-406.
- [11]. Kweyu, J. S., (2012). School determinants of curriculum implementation in public early childhood development and education centres in Mumias District (A Masters Research Project report, University of Nairobi).
- [12]. Langinger, N., (2011) on School Feeding Programs in Kenya: Transitioning to a Homegrown Approach. *Stanford Journal of International Relations*, Vol.9 No 1.31.
- [13]. Loucks, S., & Lieberman, A., (1983). Curriculum implementation. In F.W. English (Ed.), *Fundamental curriculum decisions* (pp. 126-141). Alexandria, VA: Association for supervision and curriculum development.
- [14]. McLachlan, C., Fleer, M. & Edwards, S., (2013, 2nd Edition). *Early Childhood Curriculum: Planning, Assessment, and Implementation*. New York: Cambridge University Press.
- [15]. Mohamed, A. O., (2012). Influence of feeding programmes on the participation of learners at Early Childhood development education institutions: a case of Bungoma South District (A Research Project, University of Nairobi).
- [16]. Munyiri, L. M., (2010). The impact of school feeding programme on performance of pre-school children in Kikuyu District, Central Kenya (Thesis-24th August-University of Nairobi).
- [17]. Mupondi-Masuka, G., Nyika, R., & Kangai, P., (2017). Environmental and resource challenges faced by Early Childhood Development Centres in Gweru Urban High density Suburbs. *IRA, International Journal of education and multidisciplinary studies* (ISSN 2455-2526), 6(2), 142-155. Doi: <http://ax.doi.org/10.21013/jems.v6n2.p1>
- [18]. Murundu, Z.O., Indoshi, F.C., & Okwara, M.O., (2010) School based factors influencing implementation of early childhood development and education curriculum. *Educational Research* (ISSN: 2141-5161) Vol. 1(9) pp. 382-389. Available online <http://www.interestjournals.org/ER>.
- [19]. Myers, R., (1995). *The Twelve Who Survive: Strengthening Programs of Early Childhood Development in the Third World*. 2nd ed. Ypsilanti, Mich.: High/Scope Press.
- [20]. Nyakwara, B. & Ayaga, G. N., (2014). Teacher-related Factors Influencing the Implementation of Early Childhood Development and Education Curriculum in Borabu Sub-county, Kenya. Kenyatta University; a paper presented at the International Conference on 'Re-Engineering Education for Sustainable Development' held on 18th – 20th May 2015 at Kenyatta University Conference Centre (KUCC) Nairobi, Kenya.
- [21]. Ogembo, J. O., (2012). Determinants of effective curriculum implementation in Early Childhood Development and Education Centres in Nakuru municipality, Kenya. (MED, University of Nairobi)
- [22]. Ornstein, A. & Hunkins, F., (1998). *Curriculum: Foundations, principle and issues*. Boston, MA: Allyn & Bacon. Chapter 10: Curriculum implementation.
- [23]. Philomena, C., (2012). An Evaluation of The Availability of Learning Materials for ECDE at the Teachers Advisory Centres In Kenya. *Journal of Education and Practice*, Vol 3, No 16.
- [24]. Pianta, et al., (2005). Features of Pre-Kindergarten Programs, Classrooms, and Teachers: Do They Predict Observed Classroom Quality and Child-Teacher Interactions?. *Applied Developmental Science*. University of Virginia: Lawrence Erlbaum Associates, Inc., Vol. 9, No. 3, 144–159.
- [25]. Republic of Kenya (2006). *Early childhood development policy framework for Kenya*.
- [26]. Republic of Kenya (2006). *Early Childhood Development Service Standard Service Guidelines for Kenya*.
- [27]. Shaji, M. G. & Indoshi, F. C., (2008). Conditions for implementation of the science curriculum in early childhood development and education centres in Kenya: An assessment of the conditions for implementation of a science curriculum at all 123 early childhood

- development and education centers in Kakamega Municipality, Kenya. *Contemporary Issues in Early Childhood*, Vol. 9(4) pp 389-399.
- [28]. Takesure, H., Moses, K., Christmas, D., Kudzai, C. & Emily, G., (2013). Challenges faced by ECD centres at satellite schools in Mwenzi District, Zimbabwe. *European Journal of Educational Sciences*, 1 (3), 108-115.
- [29]. The School Feeding Programme Training handbook (2006). Kenya.
- [30]. UNICEF/NYHQ (2009)-1243/Pirozzi. Early childhood development (ECD)
- [31]. UNICEF'S Child Friendly Schools (2010). Ethiopia Case Study.
- [32]. University of Zimbabwe (1995). Curriculum Implementation, Change and Innovation. (Module EA3AD 303). Harare: Centre for Distance Education, University of Zimbabwe.

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