

## **Application of Child Centred Approaches on Teaching and Learning of Mathematics Activities in Public ECDE Centres in West Pokot County, Kenya**

Nelly C. Andiema & Kisilu M. Kitainge (Phd)

University of Eldoret P.O. Box 1125-30100 Eldoret, Kenya

---

**Abstract:** *The purpose of the study was to investigate application of child centred approaches on teaching and learning of mathematics activities in preschool centres in West Pokot County. Constructivist theories advanced by Piaget and Vygotsky was used. A descriptive survey design was used. The target population comprised of teachers and head teacher drawn from 417 ECDE Centres in West Pokot County. The teachers and head teachers were selected through stratified random sampling and purposive sampling techniques. In selecting participants for the study, the main aim was to gather a wider representative range of respondents from the ECDE in West Pokot County. Questionnaire, interview guide and observation guide were used to collect data. Quantitative data collected were analysed using descriptive statistical techniques which are frequencies, mean and standard deviation. Qualitative data was transcribed coded in themes and reported in verbatim to supplement explanation of quantitative information. It was established that child centered approaches application had positive influence on teaching and learning maths activities in pre-schools. However, the utilisation of child-centered approaches found to be on average implying that several factors could be influencing teachers' utilisation of the above approach. The study recommends that ECDE centres should be adequately supported to acquired required and modern instructional medial that facilitate the use of child-centered approach, government should ensure that ECDE curriculum is provided in schools, ECDE institutions should provide teachers with in-service training.*

**Keywords:** *ECDE, mathematics activities, child-centered approaches.*

---

### **I. Introduction**

Early Childhood Development (ECD) education has the potential to benefit individuals as well as society (Moyo, Wadesango & Kurebwa, 2012). Citing Bernard Van Leer Foundation, Moyo *et al.*, (2012) said that educationists worldwide draw attention to the importance and the advantages of Early Childhood Development Education (ECDE) programmes for the holistic development of the child. ECDE education is critical for learners' development cognitive skills. The United Nations through Sustainable Development Goals (SDGs) identified early childhood development education as a key education goal (United Nations, 2015). However, United Nations Education, Scientific and Cultural Organisation [UNESCO] (2012) report showed that despite commitments and progress in improving access to education at the global level, levels of learning are still too low in ECDE in developing countries including. The report noted that at least 250 million primary school-age learners in developing countries around the world were not able to read, write or count well enough to meet minimum learning standards, including those who had spent at least four years in school (UNESCO, 2012). This shows that problem exist in teaching and learning activities in pre-schools. Wilson (2015) observed that teaching and learning approaches applied by teachers in early childhood are a matter of concern. Approaches to early childhood education vary enormously from country (Nasibi, 2005; Anne & Noa, 2013) to country and raise many questions regarding appropriate strategies for the teacher to employ. This study investigated the methods that teachers were applying in teaching and learning in public ECDE Centres in West Pokot County, Kenya.

A significant amount of research has been conducted around the world on background factors that are related to lack of achievement in school mathematics and numeracy. Popoola (2014) noted that learners' interest might not have been aroused and sustained during their pre-primary education experiences. In most cases, the learners were not exposed to numeracy skills through child-centred approaches that are widely acknowledged as the best ways learners can learn. ECDE teachers often introduce numeracy to the pupils through demonstration rather than involving them in the real activities through various activities. Learners ought to be helped early enough to develop positive attitude towards numeracy because they will need to build their future academic attainments especially in Mathematics on the knowledge acquired during the ECDE years. This study investigates application of child centred approaches affect ECDE learners acquisition of competence skills in mathematics activities in West Pokot County.

West Pokot is one of the 47 counties in Kenya located in the North Rift Region. In education setting classification, it is considered one of the Arid and Semi- Arid Lands. Research reports have shown that quality education is affected by climatic conditions, insecurity, poverty and low literacy rate (Jerop, Nyamauncho & Kabutha, 2009). Statistical analysis points to marginalization of the Northern Kenya in all aspects of enrolment, retention, participation, completion and even achievement. According to Uwezo (2013) data registered negative growth and holds the lowest rates. In West Pokot the study found out that the ratio of teacher to pupil was 1:60. The high teacher: pupil ratio could affect teacher classroom instruction delivery as the teacher: learner ratio is high. Moreover, inadequate number of trained teachers would affect teaching and learning methods employed by ECDE teachers in classrooms. Trained teachers laid claim to using application of conventional teaching approaches like multi grade learning (Jerop, Nyamauncho & Kabutha, 2009). Classroom observations revealed that this was not well executed due to lack of instructional materials, and limited teacher capacities. Multi grade approaches were very resource intensive yet the ministry of education had not invested in relevant materials or teacher preparation. The researcher found out that only conventional materials were available in each ECDE centre.

West Pokot County government currently employs ECDE teachers. However it is not known if these ECDE teachers are trained on application of child centred approaches in teaching and learning. A recent research by Nyangeri (2014) found out that most ECDE teachers in Kenya are forced to apply the less effective teacher – centred methods of teaching in classrooms. Pupils are taught content that is predicted to be examined while sometimes the same content is repeated several times for the learners to memorize (Ndani & Kimani, 2011). This affects transition of pupils from ECDE to primary school level. Moreover, UNESCO (2012) report shows that majority of learners in northern Kenya counties of which West Pokot have poor skills in reading, writing, counting and speaking. This low competency rate could relate to the teaching methods that teachers apply in classrooms. It was therefore important for the study to investigate whether application of child centred approaches influenced teaching and learning activities in ECDE Centres in West Pokot County.

### **Statement of the Problem**

In Kenya, despite extending early childhood care and education provisions, policymakers are still insufficiently informed about the effectiveness of particular ECDE teaching approaches that the empirical evidence is rather limited. Uwezo (2013) report on West Pokot county shows that, ECDE pupils are not acquiring the foundational skills of literacy and numeracy consistent with the official curricular requirements in their countries. Indeed, the low learning levels suggest a continued crisis that demands attention. Majority of ECDE centres experience inadequate qualified teachers who are trained on how to conduct their lessons using a variety of teaching approaches. Research reports shows that pupils joining class one experience competency challenges in numeracy. Therefore, the study investigated how application of child centred approaches influenced teaching and learning of mathematics activities in public ECDE Centres in West Pokot County.

### **Theoretical Framework**

The study was guided by constructivist theory developed by Piaget (1952) and Vygotsky (1978) cited by (Butler-Bowdon, 2009). The theorists suggest that that pupil construct knowledge out of their experience, constructivism is associated with pedagogic approaches that promote active learning. Piaget argued that knowledge is not the ability to memorize teacher directed facts but is the ability to transcend what one knows into a broader and improved understanding of the material and the experience in which material is presented. Piaget theory fits this study in that at pre- pre-operational period, teachers have to use learning approaches that made it possible for learners to understand concepts being taught in classroom Vygotsky emphasized social context of learning and construction of knowledge through social interaction. Vygotsky considered learning as a shared process in a responsive social context. In this case, learners are capable of developing new knowledge when they have proper assistance from teachers. Teaching activities should be organized in such a way that concepts appear not separate from the pupil's everyday life experiences of their culture. According to Vygotsky, the most effective instruction is the kind that is aimed not at the child's level of independent performance but it is instead aimed within the ZPD.

## **II. Literature Review**

Numeracy skills are important aspects of literacy skills (Popoola, 2014) that ECDE learners acquire. Hoppenbrouwer (2011) suggested that learning mathematics and learners understanding of mathematical concepts, which are related to number sense, starts in early childhood. Early childhood classrooms can be a foundation for mathematical skills needed later in life (Linder, Powers-Costello, & Stegelin Hoppenbrouwer, 2011). Numeracy in young learners contains of different domains. The first one is knowledge of numbers. This contains learning numbers, the number line and quantities and other arithmetic abilities, from which they

concluded that early difference in counting and other numeracy skills could be explained due to the amount or types of numeracy experiences the learners had during their ECDE years.

ECDE education is important for the numeracy development of young learners. To improve the numeracy achievements of learners, their motivation and interest towards the subject is very important (Hoppenbrouwer, 2011). Learner's early experiences of numeracy and mathematics are important for the motivation towards learning it. If a child is successful in numeracy, it increases the chance that he or she likes it. This is likely affected by the positive feedback, which those learners receive from their teacher (Hoppenbrouwer, 2011). It is important to create numeracy and mathematical learning environments, where the teacher (Hoppenbrouwer, 2011) actively stimulates learner's positive attitudes and motivation towards it.

According to Dobbs, Doctoroff, and Fisher (2003) it is important that a teacher use enthusiastic praise towards a child's achievement. Praise enhances the development of positivity in a child about his or her own capacities. A child's idea about their self-efficacy and the positive feedback of teachers towards child's achievement, are significant factors for being successful in numeracy and mathematics (Dobbs, Doctoroff, & Fisher, 2003). Furthermore, it is important to make numeracy and mathematics relevant for learners and to integrate it in everyday classroom activities. Those activities have to be fun and interesting for the learners and must focus on increasing learner's knowledge and skills about French (2013) argued for teaching numeracy by bringing in contexts that make sense to children, building on their own first-hand experiences of numeracy. He stipulated that early childhood educators need to connect and build on the variety and range of children's everyday experiences of numeracy in the home and early childhood settings.

Moyle (2001) noted that the sole use of worksheets and colouring-in activities fail to gauge the level of development of an individual child or even to motivate them to develop their disposition for the use of numeracy skills in their daily life, that the use of the child's real world context may provide. French (2013) provided some examples of using the context of the child to develop numeracy including: children's exposure to the concrete experience of dividing and naming things in halves and quarters (sharing fruit or play-dough "half for you...") supports the understanding of fractions. Children learn what is "big" and what is "little" when choosing what size spoon to eat with, or when hearing the story of Goldilocks and the three bears. Later they will use centimetres, kilograms and degrees to measure and compare.

Children need many of these experiences to ensure they understand critical competencies in schools. Davis (2009) stated that mathematics may affect young learner's potential math skills. ECDE age learners who experience an environment in which adults challenge and scaffold deep mathematical concepts tend to develop a foundation that increases their potential for later mathematical achievements. Meque, Nauria and Edelmira (2009) reported that; symbolic play activities are important and relevant to teaching of most of Mathematical activities as they simplify explanation and understanding of complicated Mathematical problems. Study examined the relevance play incorporated during CCA approach in ECDE curriculum other than studying a specific type of play activity used to teach a specific subject like, symbolic type of play used to teach Mathematical thinking.

### **III. Materials and Methods**

The study used descriptive survey design since it sought teachers and head teacher's opinions on application of child centred approaches on mathematics activities in ECDE West Pokot County. The target population comprised teachers and head teacher drawn from 417 ECDE in West Pokot County. The study used both probability and non-probability sampling designs. Purposive sampling was used to select head teachers. One head teacher was selected purposively from every ECDE. From the population of teachers from 417 ECDE centres, the study used 10 % giving a sample size of 41 ECDE centres and 168 ECDE teachers; hence the total sample was 209 respondents. This study used questionnaires, interview guide and observation to collect data relevant to the study. In this study, two types of validity were tested; face validity and content validity. Expert opinions literature searches and pre-testing of open-ended questions were used to improve the content validity. The questionnaires for this study were given to two experts to review its content validity.

To ensure reliability of the questionnaires, a pilot study was carried out in neighbouring Baringo County. After receiving the research instrument from the piloted teacher, split half method was used to determine a reliability index. Co-efficient alpha of 0.84 was obtained for the two sets of data. This coefficient alpha was considered acceptable as Kothari (2004) indicated that a reliability value index of 0.6 and above is adequate and preferable for descriptive research. Quantitative data collected were analysed using descriptive statistical techniques. The researcher used inferential statistics Pearson correlation to show the relationships that exists between the variables. Interviews were basically transcribed and qualitatively analysed through themes. This involved discovering themes in the interview transcripts and attempting to verify, confirm and qualify them by searching through the data and repeating the process to identify further themes, categorized and in reported in verbatim transcription to supplement explanation of quantitative information in frequency tables and charts.

#### IV. Results

Reports of results, analysis, interpretations and discussions were shown. This chapter provides a presentation of research findings of data collected from the field, analysis and interpretation.

##### Application of Child Centred Approaches on Teaching and Learning Mathematics Activities

The main dependent variable for the study was to examine variation in teaching and learning activities caused by independent variables; use of child-centered activities. The researcher found it necessary to establish the teaching and learning of Mathematics activities necessary. Moreover, ECDE learners understanding of mathematical concepts such as counting, conducting summation, subtraction and the ability to recognize and draw mathematical shapes starts in early childhood. Researchers (Popoola, 2010; Barnett, 2004) established that many students at post primary education levels performed poorly in mathematical tasks. This situation has been traced to deficient literacy skills at ECDE level (Suporitz, Foley & Mishood, 2012). The reason for this can be traced to poor foundation. Their interest might not have been aroused and sustained during their pre-primary education experiences. Therefore, the teachers were asked to indicate their rating on the ability of their pupils in mathematics based on the following scale; poor (P), Below Average (BA), Average (A), High (H) and Very high (VH). The results on math activities are as presented in Table 1.

Table 1 Teaching and Learning of Mathematics Activities

Response		P	BA	A	H	VH	M	SD
Ability of learners to count	f	18	16	62	52	9	3.11	1.056
	%	11.5	10.2	39.5	33.1	5.7		
Ability of learners to conduct summation activities	f	12	13	85	42	5	3.10	.883
	%	7.6	8.3	54.1	26.8	3.2		
Learners ability to do subtraction activities	f	10	18	77	44	8	3.14	.916
	%	6.4	11.5	49.0	28.0	5.1		
Learners ability to recognise mathematical shapes	f	9	17	58	69	4	3.27	.901
	%	5.7	10.8	36.9	43.9	2.5		
Pupils ability to draw mathematical shapes like; rectangle, triangle, circle and square	f	18	25	48	58	8	3.08	1.092
	%	11.5	15.9	30.6	36.9	5.1		

Key: P-Poor, BA-Below Average, A-Average, H-High, VH-Very High, M=Mean and SD-Standard deviation

Results from Table 1 show that 18 (11.5%) of teachers said that their pupils ability to county was poor, 16 (10.2%) indicated the level to be below average, 62 (39.5%) rated their ability as average, 52 (33.1%) said it was high and 9 (5.7%) said that it was very high. From the above findings, it is evident that learners ability to count numbers was average (M=3.41 and SD=1.056) in public ECDE centres in West Pokot County. This shows that learners' numeracy skill stills needs to be worked on to improve their understanding and performance in mathematics subject. Popoola (2014) said that non use of songs and rhymes by teachers in classroom could be the one hindering children inability to count numbers well. This is because songs and rhyme can be used to teach numbers since pupils learn in a play way method which enhances recall and easy recollection of activities in the class.

On pupils ability to sum up numbers, 12 (7.6%) indicated learners capability as poor, 13 (8.3%) said it was below average, 85 (54.1%) said it was average, 42 (26.8%) said that it was high and only 5 (3.2%) of teachers said that their learners competency in doing summation activities was very high. The mean values obtained suggests (M = 3.1 and SD = 0.883) that learners aptitude to conduct summation (addition) activities in mathematics was below average and this could be due to the approaches that teachers use in teaching them. This shows that child-centered approaches are not applied evenly across all mathematics units in classrooms. Findings disagrees with Wigfield and Eccles (2000) and Dobbs, Doctoroff, and Fisher (2003) studies that by doing more child-centered numeracy activities during the intervention, the learners will be more motivated towards numeracy learning. However, during interview some head teachers noted that child-centered approaches are used in mathematics lessons. For instance, one head noted that:

*“Child centered approach method is used in some subjects like mathematics and science activities because the resources for science and mathematics entails counters, like stones, counter which are easily available.”*

This shows that some teachers use the available resources to instruct learners and this helps to improve their mathematical skills competencies. In order to find out whether learners have the ability to do subtraction activities, findings revealed that 6 (4.9%) of teachers said learners level of conducting subtraction activities was poor, 18 (11.5%) said it was below average, 77 (49.0%) said it was on average, 44 (28.0%) said it was high and only 8 (5.1%) rated their pupils competency as very high. This implies that learners still have average (M= 3.14

and SD = 0.916) understanding of doing subtraction math activities. This shows that learners have not yet developed enough competencies at school to enable them perform mathematics subtraction activities. When teachers were asked to rate their pupils understanding and ability to recognise mathematical shapes, 9 (5.7%) held that it was below poor, 17 (10.8%) said it was below average, 58 (36.9%) alleged that it was on average, 69 (43.9%) believed it to be high while 4 (2.5%) indicated the level as high. This shows that learners ability to identify and contrast different mathematical shapes as average (M= 3.27 and SD = 0.901). From this finding, it is seen that learners' moderate level of identifying mathematical shapes could be due to their unavailability or non-usage by their teachers in schools. Observation made by the researcher showed that majority of ECDE did not have rectangular, triangle, square or even rulers' instructional media resources. This affected their effort to draw mathematical shapes as 18 (11.5%) pointed their competency as poor, 25 (15.9%) of teachers rated their pupils ability as of below average, 48 (30.6%) said it was on average, 58 (36.9%) indicated learners ability as high and only 8 (5.1%) said their ability was very high. This is confirmed by descriptive statistics results obtained (M= 3.08 and SD = 1.092). During classroom observation, the researcher recorded the following ratings of pre-school pupils' mathematics activities as given in Table 2.

Table 2 Rating of Pupils Competencies in Mathematics Activities

	Pupils competencies in mathematics	Low	Below average	Average	High	Very high
a	Ability of learners to count	0	6	13	12	7
b	Ability of learners to conduct summation activities	6	7	15	9	4
c	Learners ability to do subtraction activities	8	10	16	7	0
d	Learners ability to recognise mathematical shapes	4	6	18	6	7
e	Learners ability to draw mathematical shapes like; rectangle, triangle, circle and square	6	10	20	5	0

Observation result from Table 2 shows that most learners had average competency in mathematics activities. The study showed that learners had higher competencies on counting as opposed to other numeracy skills relating to summation, subtraction, ability to recognise mathematical shapes and drawing the mathematical shapes. In light of the aforementioned findings, learners' ability to count, do subtraction activities, recognize and draw mathematical shapes is average. Despite this, their ability to conduct summation activities is below average. At this level, learners are expected to exhibit exemplary performance in Math activities since early childhood classrooms are a foundation for mathematical skills needed later in life (Linder, *et al.*, 2011). Consequently, deficient literacy skills at ECDE level contribute to poor performance in numerical tasks at secondary level of education (Popoola, 2010). It is thus imperative for learners at ECDE level to be helped early enough to understand concepts in numeracy since they will need it to build their future academic attainments.

### Application of Child Centred Approaches on Teaching and Learning of Mathematics Activities in Public ECDE

This was the first objective of the research that sought to find out the proportion and degree to which child centered approaches; child needs approach, activity based approach, child interest approach and child discovery approach affected teaching and learning of language activities in public ECDE centres in West Pokot County. Language and other literary skills such as listening, reading, writing speaking cannot be considered as complete without numeracy skills, such as: adding, sorting by colours and by shapes. Therefore, a Pearson correlation coefficient was computed to check the strength and direction of the relationship. The (r) values range from -1 to +1. Values that are more than 0.5 shows they have strong influence while values that are below 0.5 shows weak influence (+ve or -ve). The results are presented in Table 3.

Table 3 Correlations of Application of Child Centred Approaches on Teaching and Learning of Mathematics Activities

Child centred approaches	Mathematics activities	
Child Needs Approach	Pearson Correlation	.218**
	Sig. (2-tailed)	.006
	N	157
Child Interest Approach	Pearson Correlation	.300**
	Sig. (2-tailed)	.000
	N	157
Child Discovery Approach	Pearson Correlation	.435**
	Sig. (2-tailed)	.000
	N	157
Activity Based Approach	Pearson Correlation	.405**
	Sig. (2-tailed)	.000
	N	157

\*\* Correlation is significant at the 0.01 level (2-tailed).

The correlation coefficient for the above results (Table 3) is positive which suggest that there exist significant ( $p < 0.01$ ) correlation between child centered approaches use and teaching and learning of mathematics activities by ECDE children in West Pokot County. Out of the four approaches, results shows that child discovery approach had a higher correlation ( $r = 0.435$ ) on pupils understanding of mathematics activities followed by activity based approach ( $r = 0.405$ ) then child interest approach ( $r = 0.300$ ) and lastly child needs approach ( $r = 0.218$ ). This shows that child-centered approaches have significant influence on mathematics learning. The findings are supported by interview responses from head teachers where one of them remarked that:

*“Child centered approach has great impact on acquisition of mathematics competencies where learners are exposed to counting on his own thereby improving his numeracy skills.”*

The findings of the study is in line with Popoola (2014) research study that established that use of guided play was better method of teaching numeracy skills to early basic education pupils. Popoola said that children in early basic education should be exposed to a lot of activities in a play way form. Moreover, the relationship between pre-school teachers application of learner centered approach on teaching and learning of mathematics activities in pre-school centres is significant ( $p < 0.01$ ). The findings suggest that ECDE teachers' continuous usage of child-centred approaches, teaching and learning of mathematics would be greatly influence teaching and learning through acquisition of numeracy skills. Moreover, the use of child discovery and activity based approach should be emphasised in schools to promote pupils understanding of mathematics concepts and ideas.

## V. Conclusions and Recommendations

The study has established that in using the child-centred approaches pre-school pupils state that they like and appreciate what and how they learn. They value sharing their knowledge with others, they can practice their communication skills freely and, in some cases they are able to study independently. By working in different ways they see that they can build a range of skills they need as individuals in; mathematics, languages, science and creative skills. Study findings revealed that that the four child centered teaching approaches are often ( $M = 3.52$  and  $SD = 0.51$ ) utilised by ECDE teachers in teaching and learning activities in public ECDE centres in West Pokot County. It was established that child centered approaches application by teachers in classroom teaching and learning had positive influence on mathematics activities in ECDE centres. The Pearson correlation statistics appeared to be positive suggesting that teachers did not regularly applied learner centered approaches in classroom teaching and learning. However, the results appeared to be significant ( $p < 0.05$ ) and this implied that when teachers continuously use child-centered approaches of discovery method, interest method and needs approach, learners numerical skills of counting, additions and subtraction improves. To improve on teaching and learning of mathematics activities in ECDE, there is need for schools management to adequately provide instructional resources (charts) so that teachers may shift their approach from teacher centered to learner centered. Classroom mathematics teaching should be based on more participatory practices in which the pupils are active in discussions, explorations and problem solving in small groups. Classroom activities should provide pupils with opportunities to develop their ability to discuss and explain their thoughts, which develop their numeracy skills. A similar study on application of child centred approaches on teaching and learning activities in public ECDE Centres should be done in other areas within other parts of the Country.

## References

- [1]. Anne, C.S. B. &Roa, E. C. (2013). Assessment on Learners' Science Process Skills: A Learner- Centred Approach. *International Journal of Biology Education*, 3(1), 24-44.
- [2]. Butler-Bowdon, T. (2009). *Psychology Classics*. Boston: Nicholas Brealey Publishing. Boston. Print.
- [3]. French, G. (2013). Early literacy and numeracy matters. *Journal of Early Childhood Studies*, 7, 31-45.
- [4]. GIZ (2014). *Teaching Numeracy in Pre-School and Early Grades in Low-Income Countries*. Born: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.
- [5]. Hoppenbrouwer, E. M. (2011). *Introducing a child-centered numeracy play-centre intervention in three rural ECDE in Dennilton, South Africa*. Masters Thesis, University Utrecht.
- [6]. ILO/UNESCO (2012). *Report of the Joint Committee of Experts on the Application of the Recommendations concerning teaching personnel*. Ninth Session, November,.
- [7]. Jerop S. R., Nyamauncho, Z. O. & Kabutha, J. M. (2009). *Educational Marginalization in Northern Kenya*. Background paper prepared for the Education for All Global Monitoring Report 2010.
- [8]. Kothari, C. R. (2004). *Research Methodology: Methods and Techniques* (2<sup>nd</sup> Revised Edition). New Delhi: New Age International P.L.C.
- [9]. Majanga, E. K., Nasongo, J. W. & Sylvia, V. K. (2011). The Influences of Class size on Classroom Interaction During Mathematics Discourse in the Wake of Free Primary Education: A study of public primary schools in Nakuru Municipality. *Research Journal of Social Sciences*, 3 (1), 44-49.
- [10]. Meque, E. Nuria, P. & Edelmira, B. (2009). Mathematical Learning in a Context of Play: *European Early Childhood Education Research Journal*, 17(3), 325-341.

- [11]. Moyo,J.,Wadesango, N. &Kurebwa, M. (2012). Factors that Affect the Implementation of Early Childhood Development Programmes in Zimbabwe. *Study Tribes Tribals*, 10 (2), 141-149
- [12]. Nasibi, M (2005). *Early Childhood Education; teaching at ECDE*. Nairobi: NehemaPublishers.
- [13]. Ndani, M. N. &Kimani, E. N. (2011). Factors Influencing Early Childhood Development: Teachers' Motivation in Thika District, Kenya. *African Journal of Teacher Education* 1(1), 34–37
- [14]. Piaget, J. (1952). "Piaget's Theory," in Mussen, P. (Ed.) *Carmichael's manual of child psychology*. New York: John Wiley & Sons
- [15]. Popoola, A. A. (2010). Influence of gender and classroom climate on secondary school students' achievement and mathematics related subject in Ekiti State. *Benin Journal of Gender Studies*, 1(2), 129—137. Centre for Gender Studies, University of Benin.
- [16]. Popoola, A. A. (2014). Influence of Play Way Method on the Numeracy Skills of Early Basic Education School Pupils in Ekiti State Nigeria. *Mediterranean Journal of Social Sciences*, 5 (10), 318-324.
- [17]. Republic of Kenya (2006). *West Pokot County Education Report 2014*. Kapenguria: County Director of Education.
- [18]. Rotumoi, J. & Too, J.K. (2012). Factors Influencing the Choice of Approaches used by ECDE Teachers in Baringo County, Kenya. *International Journal of Academic Research in Progressive Education and Development*, 1 (2), 177-187.
- [19]. Sekaran, U. & Bougie, R. (2010). *Research methods for business: a skill building approach*. (5<sup>th</sup> Ed.). New Delhi: John Wiley.
- [20]. Suporitz, J. Foley, E. & Mishook, J. (2012). In search of leading indicators in education. *Education Policy Analysis Archives*, 20(19). Retrieved (Dec. 2013). From [http:// epaa, asu, edu/ojs/article/view/952](http://epaa.asu.edu/ojs/article/view/952).
- [21]. UNESCO. (2013). *Education for All Global Monitoring Report: Policy paper 07. Addressing the crisis in early grade teaching*. Paris: UNESCO.
- [22]. Uwezo (2014). *Are Our Children Learning? Literacy and Numeracy across East Africa*. Nairobi: Hivos/Twaweza.
- [23]. Vavrus, F., & Thomas, M. & Bartlett, L. (2011). *Ensuring quality by attending to inquiry learner-centered pedagogy in Sub-Saharan Africa*. Addis Ababa: UNESCO: International Institute for Capacity Building in Africa.
- [24]. Vygotsky, L. (1978). *Mind in society: the development of higher psychological processes*. Cambridge: Harvard University Press.
- [25]. Wigfield, A., & Eccles, J. S. (2000). Expectancy value theory of achievement motivation. *Contemporary Educational Psychology*, 25, 68 – 81.