Influence of Non-Projected Materials on the Academic Performance of Preschool Children in Nyamaiya Division, Nyamira County, Kenya

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Abstract

The need to improve the transition and enrollment rate for pre-primary children is a matter of global concern for all education stakeholders. Thus, the purpose of the study was to assess influence of non-projected materials on the academic performance of preschool children in Nyamaiya Division, Nyamira County, Kenya. The information provided by this research will benefit policymakers, community members and academicians. It adopted descriptive research design with a target population of 41,668 pre-primary school teachers and pupils. The sample size of 102 pre-primary school teachers and 216 pupils which was determined using the Krejcie & Morgan table (1970). The researcher collected data using questionnaires and the instruments was validated by the supervisors. Reliability of the instruments was determined through a pilot study, thereafter; Cronbach alpha coefficients was used. Quantitative data was analyzed using descriptive statistics, and be presented in graph and tables.

Keywords: performance, academic, preschool, material, instructional resources

Background to Study

It is the wish of every parent that transition from preschool to primary to be as smooth as possible so that the child can attain the maximum growth and developmental milestones (Hirst, Jewis, Sojo, & Cavanagh, 2011). The importance of early learning has been increasingly recognized both in its own right and it may enhance subsequent academic performance (World Bank, 2012). However, there are several challenges that learners as well as parents and educators do face with regards to smooth transition (Marima, Kamau-Kang'ethe, & Runo, 2016). This smooth transition process is determined by several notably use of instructional materials, thus, in the pre-school preparation process of children, instructional materials play important roles in educating this age group (Duba & Orodho, 2014). Besides, since it is well understood that, children learn better by seeing and doing, instructional materials also serve as teaching and learning aid comparatively better in academic performance.

In United States of America (USA), various types of ECD interventions like provision of learning resources enhances school readiness and related educational outcomes, improve physical and mental health, and reduce engagement in high-risk behaviors (National Association for the Education of Young Children (NAEYC), 2011). Subsequently, academic performance in preschools is determined by a wide range of positive development and experiences, including increasing participating, and professional development of teachers to

enhance increased enrolment and transition rate, and these are likely to be influenced by the use of instructional resources (Hirst, Jewis, Sojo and Cavagh, 2011). The instructional resources are variety of materials in any format which influence the student's learning and the instructor's teaching and can be classified as follows: Non projected materials, projected materials, audio materials and real and three dimensional materials, Travers (1973) as quoted by (Jeptanui, 2011).

It is prime to note that with the introduction Free Primary Education and subsidized secondary education programme the government of Kenya the gross enrolment ratio increased from 91.2% in 1999 to 109% in 2010 (Orodho et al 2013). The government has also made remarkable accomplishment with regards to provision of teaching and learning materials, Republic of Kenya (2012). However, these materials have not been adequate since the government only provides for essential materials and due to financial constraints the government has not covered Early Childhood Development and Education (ECDE) privately registered in this scheme (Omaiyo, 2013).

Statement of the Problem

There are efforts by different educational stakeholders to establish pre-primary education by building classrooms and preparing teachers for early childhood education (Republic of Kenya, 2012). While some educators have been fascinated by the potential of instructional materials to enhance teaching and learning, teachers lag behind in using instructional materials, especially in teaching of number work. Moreover, several scholars have endeavored to investigate the link between teaching and learning resources and academic performance with the bulk of data generated from studies conducted in secondary and primary schools and generally covering the use and availability (Orodho, Waweru, Ndichu, & Nthinguri, 2013). This paper, therefore, bridges this gap based on a study on the use of different classified groups of instructional materials and their specific influence on academic performance.

Literature Review

In developing nations, preschool education has been shown to bring critical gains to children's social, physical, emotional and cognitive development (Early Childhood Technical Assistance Center, 2012). The Ministry of Education, Science and Technology (MOEST) officials in Kenya revealed that most teachers do not have the expertise in their subjects and learners fail examinations and few of them pursue mathematics courses at tertiary level leading to even greater shortage of mathematics teachers (Omaiyo, 2013). Number work is considered a core subject throughout the school years of each child but most Kenya pre-school teachers are not trained hence they do not have the knowledge of the types of instructional resources to be used in number work lessons.

As a result there is a poor foundation for preschoolers in number work which leads to low performance from pre-schoolers to higher levels of learning (Waithaka, 2005). Omaiyo (2013) reported that early intervention program like provision of learning resources had a positive influence on children's number work achievement. Children enrolled in pre-school with adequate instructional resources and trained teachers have an advantage of acquiring number work concepts and skills (Omaiyo, 2013).

Ezeja (2000) in Doublegist (2013), on his own view on the use of instructional materials asserts that "it helps the teachers to achieve effectively and makes teaching easy for the learner to understand the lesson very practical and lively page (p 25)" This means that instructional materials enhance effectives teaching and learning. Instructional materials when properly used help to make ideas and concept clear. They can raise learning from verbalization to true understanding and also make learning more vivid.

Ogwa (2002) observed that "a teacher that uses teaching aid to deliver his or her lesson will cover more facts at short intervals than one who uses only oral speeches for lesson delivery." So when instructional materials are used, students can see and conceptualize what is being taught much easier than nothing is used of when teaching materials are not used.

Joyce (2001) reported that during the preschool and kindergarten years, children add to what they have learned in early explorations. The environment plays a critical role, the richer the environment the more concrete opportunities there are for children to learn by interacting with instructional resources. Mwangi (2009) stated that adequate manipulative resources and models assume a critical role in helping children learn number work. Mathematical thoughts are abstract and so any model that embodies them is imperfect and has limitations. Teachers should use different models when teaching a particular concept.

Kabiru and Njenga (2007) indicated that use of variety and adequate instructional resources in pre-school classrooms arouses children's attention and sustains their interest. Learners become motivated and stay focused in number work activities. Adequate instructional resources also make learners to develop a positive attitude towards number work at an early stage. Instructional resources should be plenty to that every child in the classroom can choose what to interact with. Use of variety of resources is important so that all children can be involved and no child is left idle during number work lessons.

A study by Kibe (2011) stated that there is a good relationship between effective teachings and use of instructional materials. Kibe (2011) argued that while some educators have been fascinated by the potential of instructional materials to enhance teaching and learning, teachers lagged behind in using instructional materials during teaching and learning. Instructional materials are integral components of teaching number work in learning situations. It then shows that, for effective teaching of number work, utilization of instructional materials is necessary, thus the research explored how use of resources affects preschool children's performance in number work.

Mwangi (2009) reported that adequate manipulative (concrete) resources and models assume a critical role in helping children learn number work throughout their preschool education. Teachers should use different models when teaching a particular concept. Children should be exposed to adequate instructional resources since they acquire

knowledge by constructing it through their interactions with the environment to explore the environment. Children use concrete resources such as blocks, stones, toys, ball among others. When children are learning classification, they use concrete materials/objects such as sticks, stones, leaves and they are not able to make mental representations of the skills and concepts learnt during classification without concrete materials. Omaiyo (2013) reported that providing opportunities and material for children to classify, sort and group objects using various criteria like; color, shape, size, texture or use, help children to symbolize and use differed imitation and enhance their mental abilities. Omaiyo (2013) asserted that learners actively construct their knowledge depending on the type of resources used; see, hear or do in relation to what they know thus, children should be exposed to different types of resources so that they can construct their knowledge better.

Oginni; Awobodu; Alaka and Saibu (2013) noted that availability and adequacy of instructional resources in learning number work improves children achievement because every learner is involved in the activity given. Adequate instructional resources enable learners to acquire number work skills. As they interact with instructional resources, they learn classification skills which help them in counting, matching, modeling and tracing numbers among others.

Mandama (2007), carried out a research at Dar es Salaam in Tanzania on a situational analysis of the state of instructional materials in preprimary school, the information was collected from subject teachers, pre-primary students and head teachers. The finding was that the utilization of instructional materials was affected by the pupil teacher ratio, the arrangement of the classrooms, there was a limited instructional materials and some are were expensive. The time was also too short for effective utilization of instructional materials and of a wide variety of instructional materials outlined in the syllabus.

A study done by Chepkemoi (2012), investigated on the factors influencing the selection of instructional resources used in public pre-schools in Eldoret municipality in Kenya. The

study identified ‘in pre-schools’: Various instructional resources used; teacher attributes that influence the selection of instructional resources; investigated the head teacher-attributes that influence the selection of instructional resources and finally; and assessed the learner characteristics that influenced the selection of instructional resources.

Eshiwani (1989) also carried out a research in Kenya about the utilization of instructional resources at the level of pre- primary schools. The finding indicated that the provision of instructional aids especially textbooks seems to be the most cost effective way of increasing the quality of education in Africa. The finding also explains about the scarcity of instructional materials in pre-primary schools.

Research Methodology

This study adopted descriptive survey design because the study was to be conducted within a short period of time and not a single point in time. The descriptive survey design was appropriately suited for the study because of the nature of the problem, which is a relationship between the variables over a short period of time (Saunders et al., 2007).

According to Orodho (2004), sampling procedure means selecting a given number of respondents from a representative of a defined population. Sampling technique refers to the process of obtaining information about the entire population by examining only a part of it. Any statements made about the sample should be true for the entire population. This study therefore used Stratified Random sampling where seven women groups were selected from each ward to form strata. The researcher considered this method appropriate because it is administrative convenient.

Table 1: sampling grid

CATEGORY	Target population	Percentage (%)	Sampling technique
Headteachers	10	3.05%	Census method
Teachers	102	31.10%	Census method
Children	216	65.85%	Census method
TOTAL	328	100%	

Quantitative analysis was done to involve coding responses into categorical variables followed by application of a Statistical Package for Social Sciences (SPSS) techniques of analysis (Kombo and Tromp, 2006). To analyze the three objectives both descriptive and

inferential statistics was used in each study objective. For the descriptive statistics, the study employed analysis frequencies and percentages, while in inferential statistics, Chi square test of significance was used as the technique for analysis. Finally the quantitative data analyzed was presented by use of tables.

Results

Influence of non-projected materials on the academic performance of preschool children

Descriptive Statistics non- projected materials

The study adopted descriptive statistical techniques such as frequency, percentage and mean distribution. This helped to determine the influence of non-projected materials on the academic performance of preschool children in Nyamaiya Division, Nyamira County, Kenya. For analysis, descriptive statistics (frequency, percentage and mean distribution) for the level of agreement on a five point Likert scale of the variable, non-projected materials was determined and summarized in Table 2.

Table 2: Descriptive statistics for influence of non-projected materials on the academic performance

Statements		SD	D	U	A	SA	MEAN
Use of books leads to improved academic performance of preschool children	F	4	9	7	24	38	**4.01**
	%	**4.9**	**11.0**	**8.5**	**29.3**	**46.3**	
Use of photographs leads to improved academic performance of preschool children	F	8	7	13	29	25	**3.68**
	%	**9.8**	**8.5**	**15.9**	**35.4**	**30.5**	
Use of maps leads to improved academic performance of preschool children	F	13	10	8	21	30	**3.55**
	%	**15.9**	**12.2**	**9.8**	**25.6**	**36.6**	
Use of drawing charts leads to improved academic performance of preschool children	F	12	9	7	16	38	**3.72**
	%	**14.6**	**11.0**	**8.5**	**19.5**	**46.3**	
Use of flannel boards leads to improved academic performance of preschool children	F	6	12	8	27	29	**3.74**
	%	**7.3**	**14.6**	**9.8**	**32.9**	**35.4**	
Use of chalk boards leads to improved academic performance of preschool children	F	5	10	16	28	23	**3.66**
	%	**6.1**	**12.2**	**19.5**	**34.1**	**28.0**	

Source (Researcher, 2019)

Table 2 shows that 38(46.3%) of the respondents strongly agreed with the statement that use of books led to improved academic performance of preschool children, 24(29.3%) agreed, 9(11.0%) disagreed, 7(8.5%) were undecided and 4(4.9%) strongly disagreed with the statement. The study findings suggested that the respondents agreed (Mean=4.01) that use of books led to improved academic performance of preschool children. This implies that use of books improve academic performance of preschool children. This is in line with the findings of Orodho, Waweru, Ndichu and Nthinguri, (2013) that instructional resources such as textbooks enable learners to follow the teacher's sequence of the lesson presentation and subsequently aids in the understanding of the lesson.

Additionally, 29(35.4%) of the respondents agreed with the statement that use of photographs led to improved academic performance of preschool children, 25(30.5%) strongly agreed, 13(15.9%) were undecided, 8(9.8%) strongly disagreed and 7(8.5%) disagreed with the statement. It emerged from the study that the respondents were undecided (Mean=3.68) on whether the use of photographs led to improved academic performance of preschool children. This implies that use of photographs sometimes improve academic performance of preschool children. This concurs with the findings of Kabiru and Njenga (2007) that use of photographs is important as all children are involved and no child is left idle during number work lessons.

Similarly, 30(36.5%) of the respondents strongly agreed with the statement that use of maps led to improved academic performance of preschool children, 21(25.6%) agreed, 13(15.9%) strongly disagreed, 10(12.2%) disagreed and 8(9.8%) were undecided on the statement. The study findings suggested that the respondents were undecided (Mean=3.55) on whether use of maps led to improved academic performance of preschool children. This implies that use of maps sometimes improves academic performance of preschool children. This is in line with the findings of Ogwa (2002) that a teacher that uses teaching aid to deliver his or her lesson will cover more facts at short intervals than one who uses only oral speeches for lesson delivery.

Consequently, 38(46.3%) of the respondents strongly agreed with the statement that use of drawing charts led to improved academic performance of preschool children, 16(19.5%) agreed, 12(14.6%) strongly disagreed, 9(11.0%) disagreed and 7(8.5%) were undecided on the statement. It emerged from the study that the respondents were undecided (Mean=3.72) on whether use of drawing charts led to improved academic performance of preschool children. This implies that use of drawing charts sometimes improve academic performance of preschool children. This is in agreement with the findings of Mwangi (2009) that use of drawing charts assume a critical role in helping children learn number work throughout their preschool education.

On whether use of flannel boards led to improved academic performance of preschool children, 29(35.4%) of the respondents strongly agreed, 27(32.9%) agreed, 12(14.6%) disagreed, 8(9.8%) were undecided and 6(7.3%) strongly disagreed with the statement. The study findings suggested that the respondents were undecided (Mean=3.74) on whether use of flannel boards led to improved academic performance of preschool children. This implies that use of flannel boards sometimes improves academic performance of preschool children.

Lastly, 28(34.1%) of the respondents agreed with the statement that use of chalk boards led to improved academic performance of preschool children, 23(28.0%) strongly agreed, 16(19.5%) were undecided, 10(12.2%) disagreed and 5(6.1%) strongly disagreed with the statement. It emerged from the study that the respondents were undecided (Mean=3.66) on whether use of chalk boards led to improved academic performance of preschool children. This implies that use of chalk boards sometimes improves academic performance of preschool children.

4.4.2 Inferential Statistics on non-projected materials

The continuous variables consisted in each sub scale of the independent variable teacher appraisal were transformed into the new independent variable. This was in turn transformed into categorical Variable non-projected materials . Afterwards a correlation analysis was conducted between the recoded independent variable non-projected materials with the sub-items consisting of the dependent variable academic performance of preschool children. The results are capture in Table 4.

Table 3: Correlations non-projected materials and Academic performance of preschool children

		teaching techniques and methods	**teachers knowledge**	**teachers communication**	**Resources**	**Academic performance of preschool children**
teaching techniques and methods	Pearson Correlation	1	-.141**	-.123*	-.164**	.047
	Sig. (2-tailed)		.006	.017	.001	.364
	N	379	379	379	379	379

Source: Researcher, (2019)

The results show that Non-projected materials has weak positive correlation with academic performance of preschool children. The study therefore concluded that Non-projected materials have influence on academic performance of preschool children in Nyamira Sub County.

4.4.3 Thematic Analysis on non- projected materials
This was supported by an interviewee who had the following to say;

> *…While assessment of learning has always been and will continue to be an important aspect of teaching (it's important for teachers to know whether pupils have learned what was intended), assessment for learning has increasingly come to play an important role in classroom practice. In order to assess student learning outcome for purposes of instruction, teachers must have a "finger on the pulse" of a lesson, monitoring student understanding and, where appropriate, offering feedback to pupils. When teachers are monitoring student learning, they look carefully at what pupils are writing, or listen carefully to the questions pupils ask, in order to gauge whether they require additional activity or explanation in order to grasp the service…Male Participant, 51 years, Education Field Officer.*

This implies that when teacher appraisal on their knowledge is done, the academic performance of preschool children of pupils' improve.

Mixing and Interpretation

From the descriptive statistical analysis, the non-projected materials influence academic performance of preschool children. The inferential statistics (correlations) non-projected materials has weak positive correlation with management of pupils' discipline). The significance level below 0.05 thus indicating statistical significant difference in non-projected materials and academic performance of preschool children. The differences between means are therefore likely due to chance and likely due to the fact that the services rendered by teachers influence on pupils' academic performance of preschool children.

Conclusion

From the findings, it is concluded that instructional resources influence the academic performance of preschool children. This is because instructional resources such as non-projected materials, projected materials, audio materials and three dimensional materials lead to enhanced academic performance of preschool children. It is concluded that non-projected materials such as use of books, photographs, maps, drawing charts and flannel boards lead to improved academic performance of preschool children and use of chalk boards sometimes improve academic performance of preschool children.

Recommendation

From the findings, conclusions and the direction from the literature review, it was clear that instructional resources influence the academic performance of preschool children. Therefore, in order to enhance academic performance of preschool children, instructional resources such as non-projected materials, projected materials, audio materials and three dimensional materials should be available. Additionally: Non-projected materials such as use of books, photographs, maps, drawing charts and flannel boards lead to improved academic performance of preschool children and use of chalk boards; and projected materials such as use of overload transparencies and slides sometimes should be available.

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