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EDUCATION

INFLUENCE OF DISTANCE FROM SCHOOL ON LEARNING OUTCOMES IN NUMBER WORK ACTIVITIES AMONG LEARNERS IN PUBLIC PRE-PRIMARY SCHOOLS IN EMBAKASI EAST SUB-COUNTY, NAIROBI COUNTY, KENYA

Oduor Ruth Emily Achom[1], Dr. Paul Mutai[2] and Dr. Ann Maina[3]

[1]Maasai Mara University, Kenya;*
ORCID ID: https://orcid.org/0000-0002-6300-7731

[2]Maasai Mara University, Kenya;
ORCID ID: https://orcid.org/0009-0004-2353-3069

[3]Maasai Mara University, Kenya;
ORCID ID: https://orcid.org/0000-0001-5329-7299

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ABSTRACT

Statement of the Problem: Distance which learners cover while going to school on a daily basis determines their level of concentration in class and their eventual learning outcomes in number work activities. However, in Embakasi East Sub- County, many pre-primary school learners manifest low number work skills.

Purpose of the Study: To assess the influence of distance from school on learning outcomes in number work activities among learners in public pre-primary schools in Embakasi East Sub-county, Nairobi County, Kenya.

Methodology: The study adopted mixed methodology and applied concurrent triangulation research design. Target population was 2804 respondents comprising 23 headteachers, 103 pre-primary school teachers, 136 parents' representatives and 2542 pre-primary school learners from which a sample of 350 respondents was obtained using Yamane's Formula. Stratified sampling was used to create five strata based on the number of zones in Embakasi East Sub-county. From each zone, two headteachers and two parents' representatives were selected using purposive sampling. However, from each zone, 16 teachers and 52 learners were selected using simple random sampling. This procedure enabled the researcher to sample 10 headteachers, 80 pre-primary school teachers, 10 parents' representatives and 250 learners. Qualitative data were analyzed thematically along the objectives and presented in narrative forms. Quantitative data were analyzed descriptively using frequencies and percentages. Inferential analysis was also undertaken using Pearson's Product Moment Correlation Analysis with the help of Statistical Packages for Social Sciences (SPSS 23) and presented using tables.

Findings: The study established that many pre-primary school learners have challenges undertaking number work activities. This is attributed to the fact that many learners live in slums and go to school on foot, which affects their levels of concentration due to fatigue.

Recommendations: The Ministry of Education should liaise with other relevant agencies to improve the road infrastructure and thus, provide cheap transport for pre-primary school learners to school.

Keywords: *Distance from school, number work activities, learning outcomes, pre-primary schools.*

1. INTRODUCTION

Distance which children travel to and from school is very important and the closeness of schools to the children's homes has become a useful consideration in the establishment of schools. Allen (2013) avers that most important in the consideration of school location are the population threshold and the distance the children would have to travel to get to school every day. However, it has been a concern to educational planners that many pre-primary school learners walk long distances to and from school every day. A study undertaken in Kuala Lumpur by Kristiensena (2017) revealed that quite a number of school-going children travel long distances. According to Kristiensena (2017), this contributes to academic ills like absenteeism, delinquency, truancy, lateness and indiscipline, which ultimately affect achievement at school.

In a study conducted in France, Evans, Saltzman and Cooperman (2015) established that, when the distances travelled to school is too far for the child, besides fatigue, there is the tendency for the child to lose interest with school and begin to be truant, and may drop out of school completely. Evans et al (2015) reported that more than 50.0% of pre-primary school pre-primary school learners and 30.0% of secondary school students, drop out of school yearly, owing to the distance form from their homes to schools. According to Evans et al (2015), even when they can afford to travel by car, motorcycle or bicycle for such long distances, the stress of commuting to school weighed the children down, and the exigencies of the road left parents and guardians worried until their children returned home safely. In a study carried out in Colombia, Citizens Housing and Planning Council (2017) established that a distance of one kilometer to school on foot is considered by school headteachers to be too long for children between the ages of six and seventeen. Citizens Housing and Planning Council (2017) further found out that, if pre-primary school learners walk over one kilometer to school, the learning

outcomes would not be in the best interest of both the child and the school because set goals and objectives may not be completely achieved.

In Africa, Babatunde and Olanrewaju (2014) posit that many school-going children travel many kilometers to school. For example, a study carried out in Niger by Arubayi (2015) established that 65.3% of learners travel long distances to schools which has affected their attendance. Arubayi (2015) revealed that the location of a sizeable number of pre-primary and secondary schools in both Edo and Delta States were far away from the residences of the pre-primary school learners/students and this had some effect on school attendance.

In Zambia, Parsons, Chalkley and Jones (2017) opine that long distances travelled by children to school are among the major reasons for high dropout rates in pre-primary schools. These findings point to the fact that distance which children to school have a bearing on the participation rates in academic activities among learners. This implies that distance to school is related to propensity to enroll and absenteeism and therefore, journey to school distance should always be considered in pre-primary school location decisions. In other words, if the average distance to school can be shortened, pre-primary school learners will have more time to dedicate to school studies, work at home or leisure activities and thus, register good grades.

In a study carried out in Uganda, United Nations Education Scientific and Cultural Organization (2016) revealed that the distance travelled to school every day by pre-primary school pre-primary school learners has substantial adverse effects on attendance at school. According to UNESCO (2016), younger children at the crucial early stages of education are often the most vulnerable to dropping out of school due to the distance to school. UNESCO (2016) further noted that children may be discouraged from attending school if they are punished or chastised for arriving late after a lengthy walk to school. Often children who stay very far away from school get worried when they think of the distance they have to cover while going back, which interferes with their levels of concentration in class and thus, register low academic grades. Kenya has not been an exception with Ng'eno (2012) indicating that many pre-primary school learners registering low learning outcomes in basic numeracy or number work skills.

For example, in Embakasi East Sub-county, many pre-primary school learners register low academic achievement in basic numeracy skills. For example, a report by KNEC (2017) to monitor learner's achievement in literacy and numeracy had revealed that only 52% of pre-

primary school learners in Embakasi East Sub-county are incompetent in solving mathematics problems compared to national aggregate which stood at 79.7%. A similar survey conducted by Uwezo (2017) had revealed that 60% of the pre-primary school learners do not have the basic mathematical skills, while 34% of the pupils could not perform simple tasks that demonstrate numeracy skills. This is due to distance these learners while going to school. A study by Ratemo (2016) indicates that pre-primary school learners who attend schools in Embakasi East Sub-county come from far and have to avoid long daily traffic jams. According to the researcher, learners who travel longer walking distance, fatigue and hunger suffer drowsiness during learning as a result of walking over long distances compared to those from well-to-do families who usually cycled to school making them at the advantage of arriving at school early. These dynamics combine with others to create significant barriers preventing thousands of pre-primary school learners from attending school. However, much still needed to be done since Ratemo (2016) as well as other empirical studies have not indicated how the number of kilometers a pre-primary school learner walks to school determines his or her achievement more so in number work skills.

1.1 STATEMENT OF THE PROBLEM

Distance which children cover to and from school is a key determinant of how they concentrate in class and perform in their tests. However, performance in number work skills within Embakasi East Sub-county, is wanting, as sighted by Uwezo (2017) with 60% of the pre-primary school learners who do not have the basic mathematical skills, while 34% of the pupils could not perform simple tasks that demonstrate numeracy skills. Level of incompetent children in solving mathematics problems stands at 52% compared with the national aggregate of 79.7%. This is a worrying academic situation which calls for attention (KNEC, 2017). Thus, this study sought to interrogate the extent to which distance learners travel to school influences learning outcomes in number work skills among learners in public pre-primary schools.

1.2 OBJECTIVES OF THE STUDY

The study was guided by the following objectives:

i. To assess the levels of Learning Outcomes in Number Work Skills among learners in Public Pre-primary Schools in Embakasi East Sub-county.
ii. To assess the influence of distance from school on learning outcomes in number work activities among learners in public pre-primary schools in Embakasi East Sub-county

2. THEORETICAL FRAMEWORK

This study was guided by the ecological systems theory which was proposed by Bronfenbrenner (2001). Bronfenbrenner (2001) elaborated the ecological approach to human development in the 1970s. This theory underscores the ever-changing interactions of individuals within the context of their ever-changing environments. In his research, Bronfenbrenner (2001) perceived four aspects of the ecology in which pre-primary school learners grow up, that is, microsystems, mesosystems, exosystems, and macrosystems. Thus, the rationale of using the ecological systems theory in this study is that it recognizes the role of dynamics such as distance learners cover and from school in the academic activities of children and their learning outcomes. The study was also guided by Walberg's learning outcomes theory.

This theory posits that psychological characteristics of individual learners and their immediate psychological environments influence educational outcomes, that is, cognitive, behavior and attitude. Walberg (2012) shows that psychosocial characteristics of classroom learning environments demonstrate incremental validity in predicting learner achievement. Walberg (2012) further asserts that psychosocial characteristics such as self-concept, attitudes, behaviors, intrinsic motivation, and overall learner engagement in learning are useful in curriculum evaluation studies and can provide teachers with useful information to arrange more optimally functioning classrooms. To improve learning outcomes and educational productivity of children, as well as achievement goals, the surrounding microsystems must be considered. That is, home environment dynamics cannot be ignored if improved learning outcomes among learners in pre-primary school settings is to be realized.

3. RESEARCH METHODOLOGY

The study adopted mixed methodology and applied concurrent triangulation research design. Target population was 2804 respondents comprising 23 headteachers, 103 pre-primary school teachers, 136 parents' representatives and 2542 pre-primary school learners from which a sample of 350 respondents was obtained using Yamane's Formula. Stratified sampling was used to create five strata based on the number of zones in Embakasi East Sub-county. From each zone, two headteachers and two parents' representatives were selected using purposive sampling. However, from each zone, 16 teachers and 52 learners were selected using simple random sampling. This procedure enabled the researcher to sample 10 headteachers, 80 pre-primary school teachers, 10 parents' representatives and 250 learners. Questionnaires were used to collect data from pre-primary school teachers, interviews for headteachers and parents'

representatives whereas a sample test was administered to pre-primary school learners. Qualitative data were analyzed thematically along the objectives and presented in narrative forms. Quantitative data were analyzed descriptively using frequencies and percentages. Inferential analysis was also undertaken using Pearson's Product Moment Correlation Analysis with the help of Statistical Packages for Social Sciences (SPSS 23) and presented using tables.

4. RESULTS AND DISCUSSIONS

This section presents the findings of the study based on the objective. It also outlines the methods of presentation of the study findings and discussions.

4.1 RESPONSE RATES

In this study, 80 questionnaires were administered to pre-primary school teachers out of which 72 questionnaires were filled and returned.

The researcher also interviewed eight (8) headteachers, nine (9) parents' representatives and conducted observation schedules among 203 pre-primary school learners. This yielded response rates shown in Table 1;

Table 1: Response Rates

Respondents	Sampled Respondents	Those Who Participated	Achieved Return Rate (%)
Headteachers	10	8	80.0
Pre-primary school teachers	80	72	90.0
Parents' representatives	10	9	90.0
Pre-primary school learners	250	203	81.2
Total	**350**	**292**	**83.4**

Source: Field Data (2023)

Table 1 shows that headteachers registered a response rate of 80.0%, pre-primary school teachers registered 90.0%, parents' representatives registered 90.0% whereas pre-primary school learners registered a response rate of 81.2%. This yielded an average response rate of 83.4%. According to Creswell (2014), a response rate above 75.0% is adequate to allow for generalization of the outcomes to the target population.

Levels of Learning Outcomes in Number Work Skills among Pre-primary School Learners

The study sought to establish the levels of learning outcomes in number work skills among pre-primary school learners. This was measured by administering a sample test to learners. The test measured number recognition, number ordering, counting skills and performance of basic operations such as addition and subtraction. Results are shown in Table 2.

Table 2: Ratings of Learning Outcomes in Number Work Skills among Pre-primary School Learners

Ratings of Number Work Skills	Marks Attained from the Test (%)	Number of Pre-primary School Learners	
		f	%
Excellent (65-70)	64	30	14.8
Very Good (60-65)	61	19	9.4
Good (55-60)	59	47	23.2
Fair (45-50)	45	39	19.2
Below Average (30-40)	29	68	33.4
Total		**203**	**100.0**

Source: Field Data (2023)

Table 2 shows that only 3(14.8%) of the pre-primary school learners manifest excellent number work, 19(9.4%) showed very good number work kills, 47(23.2%) were good, 39(19.2%) are fair whereas majority, 68(33.4%) were below average. This implies that learning outcomes in number work skills among pre-primary school learners has continued to be low and justifies the concern for all stakeholders. During the interviews, headteachers also supported the fact that many pre-primary school learners have challenges with their number work and basic numeracy skills. Headteacher, H1, observed;

> *In my primary school, many pre-primary school learners have poor basic numeracy and number work skills. Many learners cannot recognize numbers nor can they perform basic operations such as addition and subtraction.*

On their part, parents' representatives also noted that their children faced difficulties performing tasks involving number work. Many pre-primary school learners could not recognize numbers, count or even perform basic operations such as addition and subtraction. Parents' representative, PR1, observed:

> *My child in pre-primary school usually finds it difficult to undertake basic tasks in number work. He cannot recognize numbers easily and fails in performing operations such as addition and subtraction.*

These findings corroborate the findings of a study conducted in San Diego in which Horne (2013) asserts that, though number work skills are enable children to learn, experiment and explore and acquire concepts in different subjects, many pre-primary school learners still exhibit low achievement in the same activities.

Distance to School and Learning Outcomes in Number Work Skills among Pre-primary School Learners

The study sought to establish how distance to school influences learning outcomes in number work skills among pre-primary school learners. This involved collecting data on mode of transport commonly used by pre-primary school learners to school. Descriptive data were collected and the results are shown in Table 3;

Table 3: Commonly Used Mode of Transport by Pre-primary School Learners

Modes of Transport	Number of Pre-primary School Learners	
	f	%
Walking	143	70.4
Use of motor vehicles	17	8.4
Use of motorbikes of bicycles	43	21.2
Total	**203**	**100.0**

Source: Field Data (2023)

Table 3 shows that majority, 143(70.4%) of the pre-primary school learners walk to school, 43(21.2%) use motorbikes and bicycle whereas a paltry, 17(8.4%) use motor vehicles.

This implies that the most common mode of transport available for learners is walking, followed by motorbikes and bicycles. This is consistent with the assertions of Allen (2013) that many pre-primary school learners walk long distances to and from school every day, which has been a concern to educational planners. This implies that the distance which children travel from and to school determine their levels of participation in academic activities and thus, how they performance in academic activities.

Table 4: Views of Pre-primary School Teachers

Test Items	SA	A	U	D	SD
	%	%	%	%	%
Pre-primary school learners go to school on foot which leave them exhausted to work hard	63.9	8.3	4.2	16.7	6.9
Walking long distances to school make pre-primary school learners not to concentrate in number work activities	56.9	13.9	2.7	20.8	5.6
Pre-primary school learners go to school on motor vehicles to hasten the arrival	69.4	6.9	5.6	13.9	4.2
In public pre-primary schools, children go to school on motor bikes to avoid getting tired due long distances	65.3	6.9	2.7	15.3	9.7
To go to school in time, pre-primary school learners use different modes of transport	66.7	11.1	5.6	12.5	4.2

Source: Field Data (2023)

Table 4 reveals that majority, 46(63.9%) of the pre-primary school teachers strongly agreed with the view that pre-primary school learners go to school on foot which leave them exhausted to work hard as did 6(8.3%) who agreed, 3(4.2%) were undecided, 12(16.7%) disagreed whereas 5(6.9%) strongly disagreed. The study also found out that majority, 41(56.9%) of the pre-primary school teachers strongly agreed with the view that walking long distances to school make pre-primary school learners not to concentrate in number work activities, 10(13.9%) agreed, 2(2.7%) were undecided, 15(20.8%) disagreed whereas 4(5.6%) strongly disagreed. These findings support those of a study carried out in Kuala Lumpur by Kristiensena (2017) which revealed that quite a number of school-going children travel long distances. According to Kristiensena (2017), this contributes to academic ills like absenteeism, delinquency, truancy, lateness and indiscipline, which ultimately affect achievement at school. These findings also support the findings of a study conducted in France in which Evans et al (2015) established that, when the distances travelled to school is too far for the child, besides fatigue, there is the tendency for the child to lose interest with school and begin to be truant, and may drop out of school completely.

Evans et al (2015) found that, even when they can afford to travel by car, motorcycle or bicycle for such long distances, the stress of commuting to school weighed the children down, and the exigencies of the road left parents and guardians worried until their children returned home safely. These findings indicate that the mode of transport a learner uses to arrive at school plays an important role in their levels of concentration. This is because leaners who travel long distances to school get exhausted and fatigued on the way and thus, cannot fully concentrate in class to undertake number work activities which requires critical thinking.

These findings further corroborate the findings of a study carried out in Embakasi East Sub-county by Ratemo (2016) which revealed that pre-primary school learners who attend schools in Embakasi East Sub-county come from far and have to avoid long daily traffic jams. According to the Ratemo (2016), learners who travel longer distances, suffer from fatigue and hunger suffer drowsiness during learning as a result of walking over long distances compared to those from well-to-do families who usually cycle to school making them at the advantage of arriving at school early. These dynamics combine with others to create significant barriers preventing thousands of pre-primary school learners from attending school. Majority, 50(69.4%) of the pre-primary school teachers strongly agreed with the view that pre-primary school learners go to school on motor vehicles to hasten their arrival, 5(6.9%) agreed, 4(5.6%) were undecided, 10(13.9%) disagreed whereas 3(4.2%) strongly disagreed. Majority,

47(65.3%) of the pre-primary school teachers strongly agreed with the view that, in public pre-primary schools, children go to school on motor bikes to avoid getting tired due long distances while 5(6.9%) agreed, 2(2.7%) were undecided, 11(15.3%) disagreed whereas 7(9.7%) strongly disagreed.

Two-thirds, 48(66.7%), of the pre-primary school teachers strongly agreed with the view that, to go to school in time, pre-primary school learners use different modes of transport while 8(11.1%) agreed, 4(5.6%) were undecided, 9(12.5%) disagreed whereas 3(4.2%) strongly disagreed. These findings support the findings of Evans et al (2015) that, when the distances travelled to school is too far for the child, besides fatigue, there is the tendency for the child to lose interest with school and begin to be truant, and may drop out of school completely. Evans et al (2015) reported that more than 50.0% of pre-primary school pre-primary school learners and 30.0% of secondary school students, drop out of school yearly, owing to the distance form from their homes to schools. According to Evans et al (2015), even when they can afford to travel by car, motorcycle or bicycle for such long distances, the stress of commuting to school weighed the children down, and the exigencies of the road left parents and guardians worried until their children returned home safely. In summary, these findings attest to the fact that distance which children travel to school have a bearing on the participation rates in academic activities among learners. This implies that distance to school is related to propensity to enroll and therefore, distance to school should always be considered in pre-primary school location decisions. In other words, if the average distance to school can be shortened, pre-primary school learners will have more time to dedicate to school studies, work at home or leisure activities and thus, register good grades. To verify the relationship between area of residence and learning outcomes in number work skills, data were collected on average distance in kilometers learners travel to school from the eight sampled pre-primary schools and performance of learners in number work skills. Results are shown in Table 5.

Table 5: Average Distance to school and Learning Outcomes of Pre-primary School Learners in Number Work Skills

Average Distance to school in Kilometers	Learning Outcomes of Pre-primary School Learners in Number Work Skills (%)
1.5	29
0.8	45
0.6	59
0.4	61
0.4	64

Table 5 shows that pre-primary school learners who travel long distances to school register lower learning outcomes in number work activities compared to their peers who stay closer to their schools. This could be due to the fact that long distances make learners tired while going to school and are thus fatigued the moment they reach school. These results were subjected to Pearson's Product Moment Correlation Analysis and results are shown in Table 6:

Table 6: Relationship Between Distance to school and Learning Outcomes in Number Work Skills among Pre-primary School Learners

		Distance to school	Learning Outcomes of Pre-primary School Learners in Number Work Skills
Distance to school	Pearson Correlation	1	-.978*
	Sig. (2-tailed)		.004
	N	5	5
Learning Outcomes of Pre-primary School Learners in Number Work Skills	Pearson Correlation	-.978*	1
	Sig. (2-tailed)	.004	
	N	5	5

*. Correlation is significant at the 0.05 level (2-tailed).

Table 6 shows Pearson's Product-Moment Correlation Analysis which was run to determine the relationship between distance learners travel to school and learning outcomes in number work skills of pre-primary school learners in number work skills. The test generated a correlation coefficient of r = -0.978 with corresponding significant level (p-value) of 0.004 which was less than the predetermined level of significance, 0.05, that is, p-value = 0.004<0.05. This implies that the distance which children travel to and from school has influence on their ability to perform impressive grades in number work activities.

During the interviews, headteachers and parents' representatives also noted that many pre-primary school learners go to school on foot which leave them exhausted to work hard. Headteacher, H2, stated;

> *In my school, learners walk as far as 1.5 kilometers to go to school. Those who are lucky, are bought to school using bicycles. This makes them not to concentrate in number work activities due to exhaustion and fatigue.*

These views were supported by parents' representatives who noted that children walk long distances to access education. Parents' representative, PR2, noted;

> *My child has to walk almost two kilometers to reach school since the cost of hiring a motorbike or bicycle rider is often very expensive. In most cases, my child comes back home very tired and sometimes even forget to undertake his homework.*

Like quantitative findings, these views are consistent with the views held by Kristiensena (2017) that many school-going children travel long distances. These views also support those of Evans et al (2015) who stated that, when the distances travelled to school is too far for the child, besides fatigue, there is the tendency for the child to lose interest with school and begin to be truant, and may drop out of school completely. These findings indicate that distance which children to school affect their participation rates in academic activities among learners. That is, if the average distance to school can be shortened, pre-primary school learners will have more time to dedicate to academic activities such as number work.

5. SUMMARY OF FINDINGS AND CONCLUSIONS

From the study findings, it is evident that many pre-primary school learners still have challenges undertaking number work activities such as number recognition, number ordering, counting skills and performance of basic operations such as addition and subtraction. From the study findings, pre-primary school learners either walk to school, use motorbikes or bicycles. However, many pre-primary school learners go to school on foot which leave them exhausted to work hard in academic undertakings.

This makes them not to concentrate in number work activities due to exhaustion and fatigue and thus, register low grades in number work activities. Thus, the distance which children to school have a bearing on the participation rates in academic activities among learners.

6. RECOMMENDATIONS

The study recommends that the Ministry of Education should liaise with other relevant agencies to improve the road infrastructure for motor vehicles with ease and thus, provide cheap transport for pre-primary school learners to school. This will reduce the cost of transport and lower time wasted on the roads by learners walking long distances to school.

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