International Journal of
Recent Innovations in Academic Research
Open Access, Peer Reviewed, Abstracted and Indexed Journal

E-ISSN: 2635-3040; P-ISSN: 2659-1561
Homepage: https://www.ijriar.com/
Volume-5, Issue-9, Sep-2021: 29-36

Research Article

Effect of Teacher Qualification on Implementation of Pre-Primary Mathematics Curriculum in Central Division, Trans-Nzoia County

Ruth. O. Onchera[1], John Ng'asike[2] and Maurice Cherekes[3]

School of Education, Mount Kenya, P.O. 342-01000 Thika.

Received: August 25, 2021 **Accepted:** September 5, 2021 **Published:** September 16, 2021

Abstract: This study aimed to determine the effect of teacher qualification on implementation of Pre-primary Mathematics Curriculum in Central Division, Trans-Nzoia County. The study's objective was to determine the effect of teacher qualification, on implementing pre-primary learners' Mathematics curriculum in Trans-Nzoia County. The study was anchored on Skinner and Erickson's Psychosocial Development and Needs Assessment theory. The researcher used a descriptive survey design. The sample size was drawn using the Fishers formula and constituted 112 respondents. Stratified sampling was used to get respondents from each sector as follows; 74 Early Childhood Development Education (ECDE) teachers, 36 primary head teachers.

The researcher used a saturated sample to select the only three educational officers. A pilot study to test reliability and validity of research instruments and the reliability were above 0.70 Cronbatch Alphas. The apparatus for data collection were the questionnaires and interview, and observation schedules. Quantitative data were analyzed using Statistical Package for Social Sciences version 11.5, and results presented using percentages, means, frequencies, and p-values, while qualitative data were analyzed using themes.

The study findings indicated a significant relationship between teacher's qualifications. The study recommends that the government should formulate a policy to always take into consideration teachers' qualifications.

Keywords: Teacher qualification, Mathematics curriculum, Primary head teachers.

Introduction

According to Hanushek (2010), teachers are assigned a central role in delivering high-quality education by policy makers and international organizations. Therefore, it is essential to provide teachers with initiatives that can facilitate improvement in education for the benefit of learners. There are efforts globally that aims at promoting the mathematics curriculum (McKnight *et al.,* 1987). For instance, in the United States, three different curricula were identified in the Second International Mathematics Study, which aimed at addressing the K-grade curriculum that was implemented by 43 states and districts within Columbia. It intended that the implementation of similar teaching and learning and giving similar assessments for all learners would bring about some uniformity in all learning institutions in Mathematics in the whole of the U.S.A.

Riley (2015) argues that the type of education received by kids when they are young in their initial years of education forms the foundation for furthering their education. Providing quality education to these learners demands that the government finance the program by developing physical facilities and have skilled teachers to implement the program. Therefore, the curriculum development should involve stakeholders, which should incorporate traditional values and modern school experiences. In Kenya, it is hard to gauge the delivery and the preparedness of ECDE teachers because most of them chose it as the last option after failing to secure the course of their dream and lacked a good job

(Republic of Kenya, 2014). Further, a study by Mwaura and Shiundu (2014) many problems facing the delivery and execution of the mathematics curriculum include but not limited to compromised teaching strategies, personnel resources, community participation, and teachers' qualifications. This study isolated teacher qualification in the early years of learning and it role in learner achievement in Pre-school Mathematics in Trans Nzoia County, Kenya.

Literature Review

Linda Darling Hammond (1998) defines a polished and qualified teacher in his teaching field as one who has successfully undergone training and is certified by the senate that he can deliver the content to the learners. As much as a teacher qualifies formally as the essential requirement showing endorsement in knowledge and competence necessary for teaching, this qualification is displayed by how a teacher organizes interactive learning experiences for learners. A successful teacher can translate content as closely as possible as stipulated in the syllabus. Likewise, a successful ECDE teacher too requires developing knowledge, skills, and attitudes necessary for effective teaching at the pre-primary school level.

Most countries consider teacher qualification as the most critical factor in teacher recruitment. In the United States, an ECDE teacher needs to possess a bachelor's degree if one expects to be employed to teach at that level. Further, an influential school teacher is also likely to have long experience if one is more effective. When a teacher is specialized, he is adequately prepared to solve specific learner needs, for example, the needs of learners of English as a Second Language (ESL) or those of learners with special needs. In America, while each state may have specific requirements for one to get certification as a qualified teacher, whatever the condition, one must have a bachelor's degree and must have completed a teacher education program.

In some states, for one to get a certification, he/she needs to pass a standardized test, while others require a teacher to have a bachelor's degree in teaching. Other states demand certification for teachers in their teaching subject or grade. Some states mandate that one must have undergone Initial Teacher Training (ITT) to be certified to be employed as a teacher in the UK. It is a strict process for one to be admitted to undergo such training and is also based on a teacher's capacity to handle subjects with a shortage of teachers. This training leads to Qualified Teacher Status (QTS) in England and Wales and the Teaching Qualification (TQ) in Scotland.

In Africa, there are essential qualifications for one to be considered a qualified teacher. In Nigeria, a primary school teacher needs to have attained a Teacher Certificate Grade II (TCGDII) at a Grade II Teacher-training college after four years of secondary school education. After 1998, one needs to possess a diploma to be a primary school teacher. A high school teacher needs a relevant education degree in a teaching subject or a general degree in that field with a post-graduate diploma in education. Teachers handling secondary schools are the most qualified in Nigeria, holding at least a bachelor's degree in their address. To teach in a university in Nigeria, one must have a doctorate, which is similar to a professor's qualification in the US and European universities.

Ruhland and Bremer (2002) consider a teacher's qualification in two ways; either traditional or alternative qualification routes. When one undergoes an undergraduate degree program or a post-graduate diploma in education, one is considered to have attained qualification through the conventional training method. An alternative method of achieving qualification is learning coursework in pedagogy and subject area without going through the traditional degree training way.

Hardy and Smith (2007) argue that for a teacher to improve his formal qualification, one should attend mentorship activities, peer evaluation programs, and professional workshops. An untrained graduate teacher with a first degree may be employed to teach but paid lowly compared to other graduates' professionally trained teachers. Such need a one-year graduate professional training to be recognized and paid as an effective teacher.

Huang and Moon (2009) study found that the teacher qualification influences a 40%-60% difference in the performance of average learners in examination action. Richardson (2014) established that learners in towns performed well in comparison to those from rural areas. The researcher concluded that the difference was due to town schools having more qualified and highly motivated teachers who made them work harder to enhance learners' performance. The present research also seeks to determine if such differences in teacher characteristics influence pre-school learner performance in Mathematics in the Central Division of Trans Nzoia County.

Maundu (1986) found out that those teachers who graduated from Kenya Science Teachers College with diplomas were more competent in subject content than those with degrees from universities. Wilson *et al.,* (2001) also support the idea that more qualified and experienced teachers highly influence learners' success than those who lack these two basic requirements.

Ashton (1996) also found out that qualified teachers positively influence learner performance compared to unqualified teachers. This research looked at how the qualifications and certification of the teachers contribute to learners' performance; Laczko and Berliner (2002) argue that a teacher's certification status influences the performance of students within the United States of America. They added that a teacher's performance depends on the school she teaches and the class level she teaches. An analysis of the above literature indicates that teacher quality is determined by whether the teacher is certified or not, the degree attained in the university, date, and type of university. The teacher achieved his grades, the teacher's age, and years of teaching experience.

There is evidence in many countries that the qualification of the teacher is highly related to the way the learners learn, and these influences education reforms in such countries, for instance in improving from certificate to graduate teacher training programs which are believed to enhance teacher quality, (Linda Darling-Hammond*,* 1998). While some findings based on the academic qualification of the teacher, either bachelor's degree or a master's degree, may not be conclusive, most researchers agree that there is a positive influence on the performance of learners handled by a teacher with higher academic qualifications (Rice, 2003).

Some researchers argue that attaining a second degree is costly and time-consuming in terms of teacher education. It discourages more good teachers from preferring to go for it (Murnane and Phillips, 1981). However, this researcher supports the idea that higher teacher qualification is a factor that enhances better classroom management, better teaching, and learning, and ultimately leads to better learner achievement not just in pre-primary Mathematics but in all other school subjects. Many studies have shown a significant relationship between the qualification of the teacher and the performance of the learner in the subject matter (Goldhaber and Brewer, 2000). Other studies drew mixed conclusions; for instance, Monk and King (1994) concluded that teacher qualification positively and negatively influences learner performance.

Goldhaber and Brewer (2000) established a positive and significant relationship between a teachers' preparedness and learners' performance in Mathematics. Still, they found no meaningful relationship between a teachers' preparedness and the performance of learners in science subjects. Rowan *et al.,* (1997) reported a positive and significant relationship between the teacher's specialization in Mathematics and the performance of their students in the subject.

Monk (1994) observed that even if a teacher has a major in Mathematics, that qualification does not significantly influence the learner performance of the learners but that a teacher who majored in physics had a negative effect on the performance of the students. Though conflicting, the study outcomes may seem, there is more evidence to support the view that trained teachers have a positive influence on learner performance. This understanding should influence policy and practice in the training and recruitment of teachers. It should be noted that teacher experience may have a positive effect on the performance of such teachers. There is also the possibility that other factors out of a

teacher's control may also influence learner performance, for instance, availability of instructional resources. This means that even a teacher who had higher grades at secondary school and passed highly in teachers' colleges may also not perform well in class if she is not accorded the necessary instructional resources.

In Kenya, the government has the policy to give in-service training to those teachers who are not qualified to teach in primary schools. There is collaboration between the Ministry of Education with the College of Education and External Studies of Nairobi University to develop distance learning programs for teaches to continue learning while performing their daily duties. Many online and long-distance instructional programs were designed and tested before they were adopted for the program for in-service teacher training. Since the early 1980s, learning through distance in-service teachers has become permanent and parallel to regular activity undertaken by other primary teacher training colleges in Kenya.

Owolabi and Adedayo (2012) did a study to establish the effect of teacher's qualification on the performance of Senior Secondary School learners in Physics. The study aimed to determine whether the teacher's status had any influence on the performance of the learners in Physics. The research design used was descriptive. The sample size was made up of students from 100 Senior Secondary and the teachers who handled the learners in each school during the 2015/2015 West African School Certificate Examination.

Kola and Sunday (2015) wrote a paper on the influence of teacher qualification on learners' academic achievement in Nigerian schools. This paper addressed the controversies surrounding the teachers' qualifications and their impact on learners' academic achievement. Their research measured teacher qualification based on seven factors which are: formal education, experience, subject matter knowledge, pedagogical studies, duration of training, certificate/licensing and professional development.

The paper looked at various opinions on the perceived teacher factors that influenced learners' performance in academics. The study concluded that the teacher's qualification was paramount in the learners' performance than his certificate, that is: degree, diploma or masters. White book (2003) did comprehensive review about teachers' level of education in the early childhood environment. It concluded that the qualification of a teacher is essential in the implementation of the ECDE program. The review also established that achievement for the learners in ECDE is positively affected by the higher qualification of the teacher.

Studies by Kola and Sunday (2015) and White book (2003) support higher teacher qualification for effective instruction. The current study considered teacher qualifications and other teacher characteristics like experience, teacher commitment, and motivation to implement Mathematics curriculum for pre-primary schools.

Methods and Materials

Gay (1996); opines that a research design is the road map that defines how data will be collected to answer questions about the present state of the study's topic. In line with this, this study was conducted using a descriptive survey research methodology. This design was preferred as it helped the study to collect data which was both quantitative and qualitative in nature. The study's targeted 104 preprimary teachers and 52 head teachers, two curriculum support officers, and one county ECDE program officer made up the study's target group. A suitable sample size of 112 respondents was selected to represent the study population in data collection process. Data collection was undertaken after undertaking the due ethical process like seeking for permits and authorization before data collection. The study used questionnaires, interviews, and observation schedules as data collection instruments. Quantitative data was analyzed and presented using percentages, means, p-values, and frequencies using the Statistical Package for Social Sciences (SPSS) version 27.0.

Qualitative data was organized into themes and presented alongside respective quantitative data analysis.

Key Findings

The study sought to test the effect of teacher qualification on the implementation of a pre-primary Mathematics curriculum. The findings are presented in the table below.

Table 1. Teacher Qualification on Mathematics Curriculum

Teacher Qualification	T	Df	Mean	Sig	Remarks
Grade attained	9.743	49	3.81 (76.20%)	.140	No effect
In-service Training	1.07	51	3.67 (73.40%)	.560	No effect
ITT Training	7.538	49	3.70 (74.00%)	.314	No effect
Subject Specialization	1.52	51	3.70 (74.00%)	.296	No effect
Teaching Practice	6.94	51	3.70 (74.00%)	.314	No effect
Academic level	7.538	49	4.88 (97.81%)	0.00	Affect
Source: Field Data (2021)					

The study findings indicated that the grade attained by a teacher either at school or in college does not affect (p-value=.140) implementation of the Pre-primary Mathematics curriculum among pre-school learners. This value may imply that the grade a teacher attains in high school or at teachers' college does not affect how a particular teacher teaches Mathematics at pre-primary school. The findings also indicated that in-service training of teachers does not affect (p-value=0.560) implementation of the pre-primary Mathematics curriculum. This may imply that in-service training does not add value to the teaching of pre-primary Mathematics. It may also mean that unqualified teachers or those already qualified do not need workshops to improve their education since their performance remains the same.

The study findings indicated that ITT training does not affect (p-value=0.314) implementation of the pre-primary Mathematics curriculum; this may imply that though most people assume that pre-service teacher training is essential, it may not be so as both qualified and unqualified teachers seemed to achieve similar results. The study also found that subject specialization does not affect (p-value=0.296) implementation of the pre-primary Mathematics curriculum. This may seem attractive because, in other educational levels, such as a secondary school, teachers specialize in teaching specific subjects. Doing so is said to have some benefits. However, according to this study, pre-primary school teachers do not need specialization, possibly because the teachers need closer contact with their learners over a long period for effective teaching.

This means a single teacher teaches all subjects in a specific pre-school class level for consistent communication with her learners to encourage and correct them for effective learner performance. The study indicated that teaching practice does not affect (p-value=.314) implementation of the Pre-primary Mathematics curriculum. This p-value is interesting because teaching practice constitutes an essential aspect of teacher training. When untrained pre-school teachers perform and those who are trained, it may seem that teaching practice may seem an unnecessary burden in the teacher training programs.

Finally, the study findings indicate that teacher qualification in terms of academic level effect (p-value=0.00) implements pre-primary Mathematics curriculum. It implies that the more a teacher achieves educational certification, the more competent it is to be in terms of classroom delivery. Such a teacher is likely to be a better performer than one with lower academic standards. This is why colleges should admit students with higher academic grades to register in teacher training colleges, and equally, they pass well in college examinations before being deployed as teachers.

The observation saw that trained teachers with high academic levels had more interactive learners when compared with those taught by untrained teachers with lower academic grades. The learners were actively interacting amongst themselves because of the encouragement from their committed teachers. Also, the rate of interaction of the learners with their teachers was seen to be active.

Consequently, in areas where a school's academic performance is a more significant challenge, then a qualified teacher is more desirable. They participated in staff recruitment to a great extent, ensured their staff understands their limit to independent action, conducted themselves so their staff could respect them, and made sure that the teacher-pupil relationship is enjoyable and friendly.

The findings from the interview schedules on the effect of teacher qualification on implementation of Pre-primary Mathematics curriculum indicate that a majority of the respondents that is the head teachers, CSOs, and program officers, thought that the capability of the teachers was essential in influencing the implementation of Mathematics curriculum among pre-school learners since it determined their ability to carry out their duties effectively.

One head teacher on the interview said, "The teachers' with proper qualifications in the school yield better results as their learners excel more. They are better when teaching in class. In fact their learners interact more among themselves and with the teacher. It is a very interesting class if you are to observe." The views from the interview supported what most of the teachers indicated in the questionnaires.

Conclusion

The study concludes that teachers' qualifications in respect of academic level affect the implementation of the preprimary Mathematics curriculum. Therefore, the more a teacher achieves a higher educational level, the more the teacher's capacity in delivering Mathematics curriculum to preprimary learners.

Recommendations of the Study

The study recommends that teacher students being recruited to teacher training colleges should be of higher academic grades. Equally, the practicing teachers should be retrained through in-service and workshops. Pre-school administrators in pre-school centers should arrange regular seminars and refresher courses for pre-school teachers to update themselves on the changing curriculum trends and relevant instructional techniques.

Conflicts of interest: The authors declare no conflicts of interest.

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Citation: Ruth. O. Onchera, John Ng'asike and Maurice Cherekes. 2021. Effect of Teacher Qualification on Implementation of Pre-Primary Mathematics Curriculum in Central Division, Trans-Nzoia County. International Journal of Recent Innovations in Academic Research, 5(9): 29-36.