

Influence of Use of Individualized Educational Program in Teaching Science Subjects on Academic Performance in Sciences of Deaf Students' at Ngala School for The Deaf, Nakuru County, Kenya

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Abstract

The study sought to determine the influence of use of individualized educational program in teaching science subjects on academic performance in sciences of deaf students' at Ngala school for the deaf in Nakuru County. The study used a descriptive case study design. The target population is 472 respondents at Ngala secondary school of the deaf. Quantitative data was presented using percentages, frequency tables and charts. The study found out that the teachers discussed their individualized educational program with their students after every continuous assessment test and during academic clinics. Interview with the Principal indicated teachers were using individualized educational program in monitoring learners performance though this was being done to a less extend. Observation in learning trend revealed that, though teachers maintained higher standards of academic learning which were not limited to Academic Clinic, marking of exercise books, follow up on students corrections and doing revision of continuous assessment tests, there was no documentary evidence to support existence of individualized educational program in school. The study concluded that there are no record to support existence of an individualized educational program in school as the Law requires. This had made many learners with special needs who required individualized educational program to lag behind hence creating a gap in performance in sciences in national examinations. The study recommended that there is need for intensive immersion of teachers on individualized educational program preparation which may include organizing in-service teachers training Courses on individualized educational program development.

Key Words: *Individualized Educational Program, Deaf, Performance, Sciences, Kenya*

1.0 Introduction

World wide, over the last 40 years, results from numerous studies have indicated that deaf children perform poorly in science subjects (Qi & Mitchell, 2012). In addition, studies reported that science achievement of deaf students in various countries has been significantly poorer than that of their hearing peers (Pagliaro, 2010). Access to individualized education programme for the physically disabled is more popular in developed countries unlike in developing countries (Lincove, 2009). In developing countries in Asia and Africa, the efforts to ensure equitable access to IEP for children with disability have been a challenge. The Sub-Saharan African countries are on the verge of achieving development and implementation of the individualized educational programme.

Salvador-Carulla and Bertelli (2008) opine that Individualized Education Programme (IEP) is a written plan of action that specifies an individual's progress towards specific educational goals, developed and implemented by a team of experts. In the USA, IEP has been the basis of special needs education since the inception and enactment of the Education for All Handicapped children Act in 1975. It

still remains a core component of special education requirements and practices. The Individualized Disability Education Act requires that certain types of information have to be included in every learner's IEP. The IEP is developed to meet a child's needs (Childre & Chambers, 2005). All IEPs, contain the following information regarding the child with disability: present levels of educational performance, measurable annual goals, special education and related services, participation levels with other non-disabled children, plan for delivering services and modifications, measuring and reporting progress as well as a degree of access to general curriculum including the amount of time spent participating in general education (Varma, 2009).

A study by Marschark, Shaver, Nagle, and Newman (2015) on performance of deaf and hard-of-hearing (DHH) secondary students on sciences subtest was better than on reading comprehension subtests of the Woodcock–Johnson Tests of Cognitive Abilities and Tests of Achievement, although both scores were significantly lower when compared to the hearing population. Despite reports of historically low and stagnant academic achievement, results of a study conducted by Antia, Jones, Reed, and Kreimeyer (2009) shed a more positive light on deaf students' school achievement. During a 5-year period, scores on standardized assessments of reading, language, and sciences, as well as demographic and communication data were obtained from 197 DHH students enrolled in mainstream classrooms for at least 2 hours daily. The results indicated that over that period, many students achieved average or above average levels.

According to the Ministry of Education, (2006) in Taiwan, Special Education Law provides the strongest legislative direction for mandating teamwork services in implementing Individualized Education Programme which include a written document outlining early intervention services required in inclusive education. Similarly, in Turkey, the legal regulations provide for IEP development to enable each and every child with the special need to benefit from an education service suitable for his/her needs and it further stipulates that IEP development shall be undertaken by a team. Similarly, the Turkish Ministry of Education in 1997 recognized the need for having regulations for special education in which the principles of educating children with disability, their schooling process and the importance of IEP were clearly identified (Carter & Wilson, 2011).

There are emerging trends in education of learners with special needs in many of African countries which have recognized Special Needs Education (SNE) as a necessity for all children with disability. In preparation of all Special Needs Education (SNE) students in resource centre and special schools, the National Special Education Materials Centre was opened in Harare. (Patton & McMahon, 2006). However, IDEA demands that a child that receives special education must be receiving an Individualized Education Programme (IEP). Therefore, it is assumed that with recognition of special education, these African countries are developing and implementing IEP's for learners with disabilities in their schools. There are few studies that have been carried out in Kenya on the use of individualized educational program in teaching science subjects among secondary schools for the deaf.

A study was done by Ndanu (2012) researched on the influence of IEP for learners with learning difficulties in primary schools in Mwingi District, Kitui County in Kenya. The findings of the study was that despite applying several teaching or learning strategies to facilitate teaching/learning processes, the performance of learners with learning difficulties was quite minimal. Therefore the current study sought to determine the influence of use of individualized educational program in teaching science subjects on academic performance in sciences of deaf students' at Ngala School for the Deaf in Nakuru County, Kenya. The remainder of this article paper is organized as follows. Section 2 covers review of past studies. Section 3 covers materials and methods. Section 4 results and discussion while section 5 conclusion and recommendations.

2.0 Literature Review

2.1 Use of Individualized Education Program to Monitor Learners Learning Pace

Roles of teachers of the deaf students are changing rapidly, as the classroom settings and demographic factors of learning become more demanding. Teachers are increasingly faced with challenging roles of monitoring student performance in class to address the prevailing low performance. According to Jodi (1996), Individualized Education Program (IEP) is a developmentally appropriate curriculum based on each learner needs. Developmentally appropriate, means that each child's unique progress and growth are used to determine what he or she should accomplish.

Gibbs (1992) noted that, individualized learning gives students greater autonomy and control over choices of subject matter, learning methods and pace of the study. Keefe (2007) agrees when he acknowledges that every learner has unique experiential background and unique set of talents and personal interest which must be taken into consideration during learning in class. There are no two individual learners who exhibit the same behaviour patterns or possess the same goals or aspiration in class (Njeri, 2012). While evaluating newly trained teachers of the deaf (Rittenhouse, 2004) found out that, while they were typically energetic and willing to attempt to tackle new ideas, they often lacked skills necessary for successful maintenance and development of Individualized Educational Program (IEPs).

Similar concerns have been expressed that many teachers lack the necessary training and knowledge to implement IEPs in class (Martin, Greene & Borland 2004; Rosas 2009). As teachers continue to lack these important skills, a study conducted at the Institute of Science in America on importance of Individualized Education Program (IEP), reveals it's was key to students' improvement in class. El-zraigat (2012) carried out a study on challenges of educating students who were deaf and hard of hearing in Jordan. He surveyed 30 teachers and four Principals drawn from four schools. In his study, he found out that many teachers lacked the necessary expertise in planning Individualized Education Program (IEP).

Ndurumo (1993) in Kenya established almost the same findings. He noted that, students who were deaf benefited more from Individualized Education Program (IEP) as their needs and interests were catered for in class based on their learning pace. He further noted that, failure of deaf students to master academics subjects was as a result of failure by teachers of the deaf to cater for their individual differences. Ndurumo (1993) study highlighted urgent need to introduce Individualized Educational Program (IEP) to address the prevailing poor performance. Present study seeks to find out if teachers at Ngala School are incorporating IEP in their teaching during learning of science in class and how this is facilitating achievement of science goals in curriculum.

3.0 Materials & Methods

The study used the descriptive research design to obtain data. It was suitable for this study as it provides an indepth description of data in the natural setting. Target population is also known as unit of observation and it refers to the large collection of all subjects from where a sample is drawn (Oso & Onen, 2009). The target population comprised of 1 principal, 21 teachers, and 250 students of Ngala secondary school of the deaf. The sample size for this research was obtained using Slovincs (2012) sample size determination formula. The formula is: $n = N/1 + Ne^2$ $n = 250/1 + 250 * 0.05^2 = 153.85 \approx 153$ students at Ngala secondary school for the deaf. The researcher used purposive sampling technique when sampling Teachers and Principals to take part in research.

Stratified random sampling techniques was used to select a sample size of 153 students. 117 are deaf students while 36 are hearing students. Only Form Two to Four science students took part in the study. The study used questionnaires, interview and lesson observation schedules as instruments for data collection. There are two sets of questionnaires meant for science teachers and students

respectively, then interview schedule for principal. Before the actual study, the researcher was carried out pilot study at Murang'a Secondary School for the Deaf.

The school was picked because it is among schools that is perpetually performing poor in sciences. The researcher also pre-tested observation schedules. This is quite essential as it helps the researcher in estimating reliability and validity of the researcher instruments. Validity of research instruments was determined through professional judgment by the supervisors. On the other hand, reliability is the degree to which a research instrument yields the same results or data after repeated trials (Kothari, 2004). After the pilot study, reliability coefficient of all the instruments was determined. This was done through administering instruments to the participants involved in the study at different times in close succession using test-retest method. This was done in two consecutive days after which correlation between the two sets of data will be determined using Pearson Product Moment Correlation Formulae. For lesson observation schedule the researcher made two different observations. One was done during morning session and the other during afternoon session for a period of two days.

The degree of agreement between the two observations was then evaluated by the researcher together with the supervisor. The items on the list were then reviewed and redefined for accuracy before the actual study. Data collected by the researcher was analyzed both quantitatively and qualitatively. Quantitative data from closed, open ended questionnaires and lessons observations schedules were analyzed and presented by descriptive statistics. SPSS Version 22.0 was used in the analysis of the quantitative data while qualitative data was analyzed based on major themes and then reported in narrative form.

4.0 Results & Discussions

4.1 Extent to Which Teachers Incorporate IEP in teaching Process

Teachers were asked to state if they were using IEP in teaching and monitoring performance in sciences. Their responses were as shown in the Figure 4.1. From the findings, 58% of the total respondents acknowledged that individualized educational program was being incorporated in teaching process while 42% opined that individualized educational program was not being incorporated in teaching process.

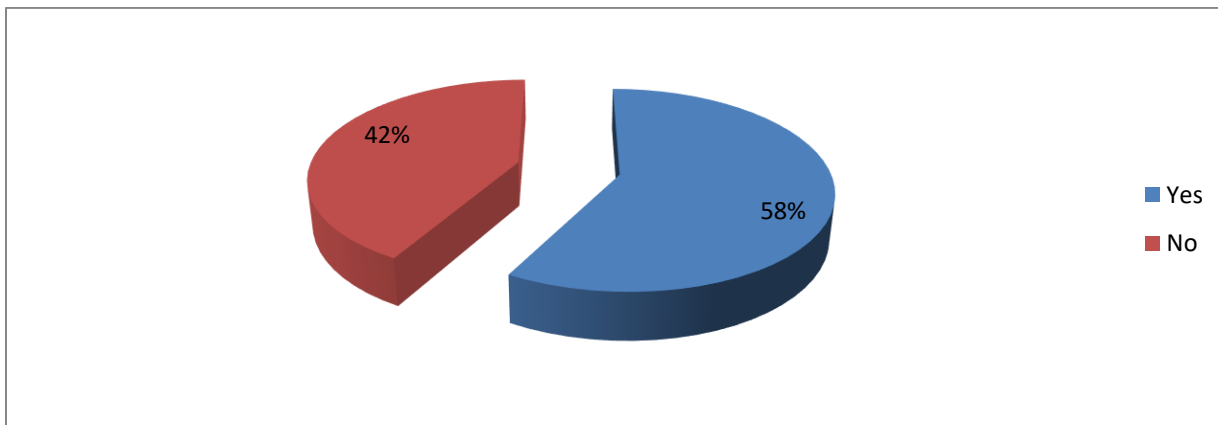


Fig 4.1: Teachers Responses on Whether their Teaching Incorporated IEP in teaching science subjects

The students were equally asked to state if they had an IEP or not. Their responses were as shown in Fig 4.2.

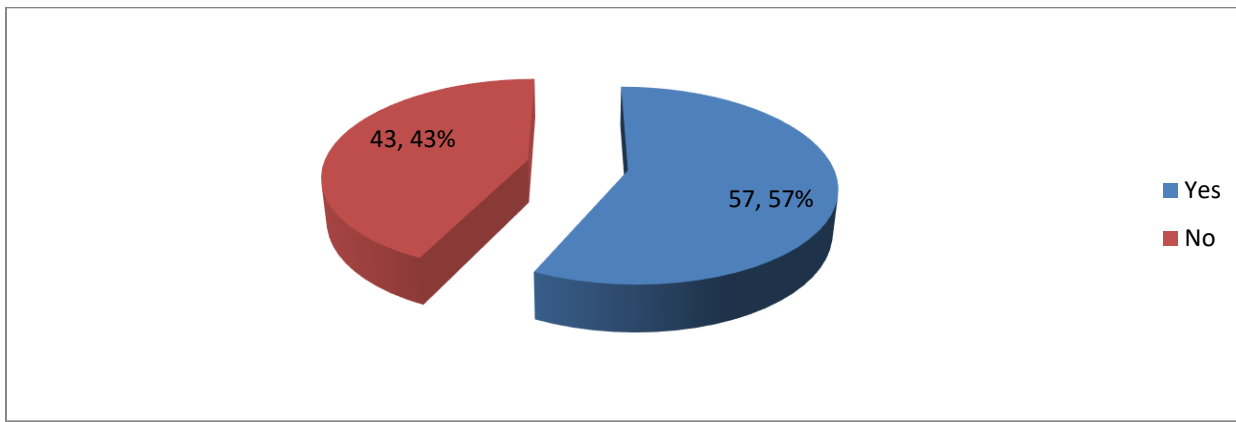


Fig 4.2: Students Responses on whether their Teaching Incorporated IEP in teaching science subjects

From the findings, majority of the students (57.0%) reported having an IEP while (43.0%) reported they did not have. Teachers were also asked to give frequency at which they discussed IEP with their students. Their responses were as shown in Table 4.1.

Table 4.1: How often Teachers Discuss IEP with their students

		Always	Seldom	Undecided	None
After every teaching	F	1	2	1	1
	%	20.0	40.0	20.0	20.0
After every cat	F	2	1	1	1
	%	40.0	20.0	20.0	20.0
After end of every term	F	1	2	1	1
	%	20.0	40.0	20.0	20.0
During academic clinic	F	2	1	1	1
	%	40.0	20.0	20.0	20.0
During IEP review	F	1	2	1	1
	%	20.0	40.0	20.0	20.0

Twenty percent of the teachers reported to have discussed IEP with their students after every teaching, (40.0%) did this seldom, 20.0% undecided while 20.0% none. 40.0% reported to have discussed after every CAT, 20.0% seldom. 20.0% undecided while 20.0% none. 20.0% discussed at the end of the term, 40.0% did it seldom, 20.0% undecided while 20.0% none. 20% discussed during academic Clinics, 20.0% did it seldom, 20.0% were undecided while, 20.0% none. Twenty percent (20%) discussed during IEP review always, 40.0% did it seldom, 20.0% were undecided while 20.0% none. Interview with the principal reported the school was using IEP in monitoring students' academic performance, though this was being used to a lesser extent.

Analysis of teachers' responses revealed that majority of them (40.0%) discussed their IEP with their students after every CAT and during academic clinics. Interview with the Principal indicated teachers were using IEP in monitoring learners performance though this was being done to a less extend. Observation in learning trend revealed that, though teachers maintained higher standards of academic learning which were not limited to Academic Clinic, marking of exercise books, follow up on students corrections and doing revision of continuous assessment tests, there was no documentary evidence to support existence of IEP in school. Most of them existed as brief case IEP which did not seem to follow IEP format expected of such learners. These findings support Rittenhouse (2004) study on evaluating newly trained teachers of the deaf; she established that, while they were typically energetic and willing to attempt to tackle new ideas, they often lacked skills necessary for successful maintenance and development of Individualized Education Program.

Similar study by El-zraigat (2012) on challenges of educating students who were deaf and hard of hearing in Jordan established almost the same findings. In his study of 30 teachers and four Principals drawn from four schools he found out that many teachers lacked the necessary expertise in planning and maintaining Individualized Education Program (IEP). Students' responses were not utilised in this section since from the beginning, their responses seemed to address their personal convenience. Most of them seemed not to comprehend exactly what IEP meant even after being assisted by the researcher assistant. They equated it to continuous revision, academic Clinic that were being done in school as a parcel of addressing general inefficiencies in academics hence their inclusion here would have simply watered down the recommendations to be made.

5.0 Conclusions and Recommendations

The study concluded that many teachers though they maintain higher academic aspirations for their students, there are no record to support existence of an IEP in school as the Law requires. This had made many learners with special needs who required IEP to lag behind hence creating a gap in performance in sciences in national examinations. It's therefore important that teachers be trained on IEP preparation and be encouraged to use it in monitoring students performance in class and giving the necessary intervention. There is need for intensive immersion of teachers on IEP preparation which may include organizing in-service teachers training Courses on IEP development. This should be facilitated by MoEST in conjunction with Kenya Institute of Special Education (KISE) and any University offering Special Needs Education. Teachers Service Commission in conjunction with the Ministry of Education Science and Technology should only post teachers who have trained in Special Needs Education and understand the learning psychology of deaf learners. There is need for coordinated efforts between KICD and Special Education stakeholders to work together in adapting science curriculum comprehensively to be in line with the learning pace of deaf students.

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