Bilingual Deaf Education: Enhancing Literacy among Deaf Learners in Secondary Education in Tanzania

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Abstract

Educating deaf students has been a concern of many education stakeholders. Due to inadequate research on deaf education in Tanzania, significant information about the learning of deaf students is missing. However, the adoption of inclusive education has not been of significant help to deaf students' literacy and learning. Consequently, less than 9% of deaf students in Tanzania have reached the secondary education level, while more than 80% drop out and/or fail. This paper explored literacy skills among Form Two deaf students in 24 secondary schools and found that all the studied students had some varying literacy challenges. They could not produce intelligible written texts in either Kiswahili or English language. This paper has highlighted specific literacy challenges and proposes a drill mechanism for promoting literacy among such students.

*Keywords: deaf education, literacy, bilinguality, learning*

Introduction

Educating deaf[1] children has been a continuous global debate that is grounded on diverse perspectives and beliefs among scholars and educational research (Mkama, 2021a). Recent research (Adoyo, 2007; Armstrong, 2009; Marschark, 2007; Mcilroy, 2018) has accounted for ways in which deaf learners can be educated not because of their 'disability', but because of their strengths, unique learning styles, and different cognitive capacities. The inability to use auditory paths for information input, makes deaf learners use perceptual input through sight and senses. Hence, as Marschark and Knoors (2014, p.1) underscore, "they are visual learners" and this makes their learning visual and tactile – connected with a sense of touch.

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[1]   The term has been used for generic reference of deaf, Deaf, DeaF, Hard-of-Hearing-, and Hearing-Impaired person.

This contention observes what Marschark and Knoors (2014) underscored, "if we want to teach deaf learners effectively, we really need to learn from our teaching and make teaching ground in what we know about learning in general and about teaching in relation to learning in particular".

Most deaf children are born to hearing parents and this denies most opportunities for language development background to the fact that most parents use spoken language for most of their communication. The delay in communication development in deaf children affects their social-emotional development (Marschark & Knoors, 2014). Language development in a child affects the learning process. Learning begins to grow when a child is conceived. At the conception stage, a fetus begins to learn to communicate not only with its mother but also with the environment around the mother. The conception stage marks the first milestone of brain development and hence the initial stage of learning development. Several scholars have accounted for how learning is a complex process that is interlocked by several factors. Jean Piaget has elaborated on six stages of sensory-motor development from the first month of a child after birth to 24 months. In such stages, Piaget identified adaptation, imitation, and reinforcement as the three learning stages of a child.

i.   Adaptation: a large part of learning occurs in this way. With adaptation, usually, a child uses past experiences for solutions to new problems. For example, in sucking chocolates, a child uses experiences of sucking the breasts of its mother. Three main processes are involved in the first adaptation stage.

Assimilate≠ Old behaviours	Accomodate Learn new ways	Equilibrium Decision
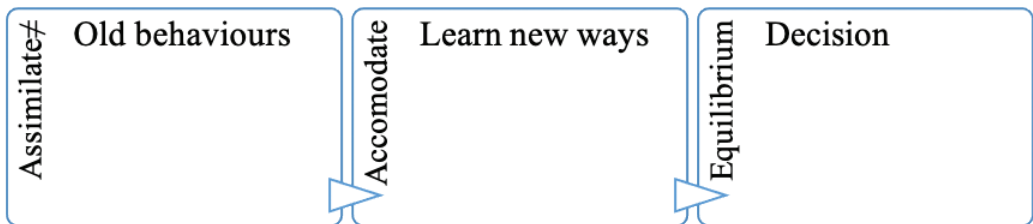
Source: Adapted and modified from Johnson (2014)

As the figure suggests, adaptation is the natural tendency to adapt to one's environment and it involves three interlocking elements; assimilation, accommodation, and equilibrium. Assimilation occurs when one assimilates new information with existing behaviours. Accomodation occurs when we encounter new information that either does not fit the current schemata or where no schema related to this new information currently exists, whereas equilibrium is the motivating force behind all learning. It is the constant striving for balance between new information and existing schemata. The three elements, which

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entail stages of information processing, are predominant processes for learning development which are also undergone by deaf children.

ii. Imitation: from every behaviour, a child imitates adults and/or neighbouring environments. The whole learning process is through imitation, hence the parent is expected to transfer all desirable behaviours to a child.

iii. Reinforcement and reward: this happens when a child does something that brings results and is rewarded.

Deaf children pass through similar stages despite being disadvantaged by the language environments in which they are born and growing. Marschark & Knoors (2014) pointed out, 95% of deaf children are born to hearing parents and grow from hearing families who use spoken languages for much of their communication. Thus, both their language and social-emotional developments depreciate.

Bilingual deaf education

Bilingual deaf education emanates from the postmodernist view that not only underscores diverse ways to communicate (Mkama, 2021a) but also sees sign language as the main language to communicate with deaf persons (McIlroy & Storbeck, 2011, p. 495). This view is more humanistic and real because it sees the value of human beings in whatever status one might be, and thus considers a strong linguistic difference between sign and spoken languages, which is a major differentiating factor for deaf and hearing students.

Bilingual deaf education advocates for the Auditory-Vocal Modality – the use of spoken/written languages. With spoken language(s), only deaf students with residual hearing can benefit. However, the modality is beneficial in developing literacy skills in severely and profoundly deaf students. Auditory-Vocal Modality gives an avenue to deaf students to exercise a range of communication means within their range of severity of the hearing loss. This includes using cued speech, lip-reading, and written forms. The available research (Marschark, Gladys, & Knoors, 2014; Swanwick, 2017) has continually insisted that signed and spoken languages have the role of transferring linguistic aspects from one person to one another and the development of code blending. Thus, bilingual deaf education is viewed as the instrument for developing sign language fluency which is a foundation for second language learning in deaf children.

Generally, bilinguality requires the introduction of a bilingual curriculum in which both signed and spoken languages are taught as subjects and are subjected to

assessments on an equal basis. On the other hand, the introduction of a bilingual curriculum improves teachers' levels of sign language skills, and eventually, enhances communication adequacy between them and deaf students.

Tanzania has made concerted efforts to educate deaf children since its independence. However, in the early 2000s, there has been a huge shift in the provision of education to deaf students, and one of the huge shifts is through the introduction of sign language in education. The use of sign language in education paves a promising future for education achievement among the majority of deaf learners who essentially use sign language for their communication endeavours. The shift has witnessed great developments leading to the pronouncement of Tanzanian Sign Language in the National Policy of Education of 2014.

Other recent developments that have been reached include launching the first *digital Tanzanian Sign Language dictionary* with a large collection of 7200+ video signs and pictures along with their meaning in two languages – Kiswahili and English. This dictionary is comparable with the American Sign Language dictionary which has 40,000+ videos and signs (Mitchell, 2013). The preparation of the TSL dictionary is anticipated to provide teachers and students with adequate signs in different subject disciplines, hence reducing available anxieties among teachers when they set to teach deaf students (Brons & Namirembe, 2018; Mkama, et. al., 2015; Knoors, 2014). Despite these developments, deaf students have been reported to have unsatisfactory education outcomes. Mkama (2021a) identified that deaf students have consistently attained the lowest grades in examination results compared to hearing peers across the five years of analysis. In the Form Two National Assessment (FTNA), 346 students were registered among whom 30.3% (N=105) got division 0 and 51.7% (N=179) got division 4. The rest 17.9% (N=62) students got between divisions 1 and 3. Hence, 241 students were able to proceed to the next class, while 74.2% of them were those with division 4. These results compelled the researcher to explore literacy levels among deaf students. Hence, the objectives of this research are to explore literacy levels in written Kiswahili and/or English and propose language drills among deaf learners for enhancing their learning.

Methodology

The study involved a learning assessment among 428 Form Two deaf students who are enrolled in the selected 24[2] inclusive schools in Tanzania to assess, among others, language abilities among targeted students. These students were screened

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2   Only selected 24 schools from Tanzania mainland.

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when they were in their Form One, and hence this study is a continuation of preparing adequate interventions to enhance their learning. Since the study was meant to explore literacy levels among deaf students, secondary schools with deaf students were purposely sampled. The choice of secondary schools was attributed to the consistent reports of deaf students in secondary education to have been doing poorly in their academic performance as compared to their hearing colleagues. The study adopts a qualitative approach that allows for the collection of behavioural data. Hence, the Multilingual Assessment Instrument for Narrative (MAIN[3]) tool was chosen to allow the researcher to explore the language levels of students. The MAIN tool is beneficial to this kind of study because it can assess multi-language levels. Using the MAIN tool, students were shown a picture series, and each student was required to look at the pictures and narrate a story whether in sign language or spoken Kiswahili or English. All deaf students chose to use sign language to narrate a story despite their fluency levels. Notwithstanding, students were also encouraged to write the story on pieces of paper – in either language.

The data were analyzed thematically, and error analysis was used as the main tool for the analysis of errors committed during writing in Kiswahili or English languages. Analyses of errors were in line with Jack's (2022) contentions that when learners produce any second language, they may produce inaccurate forms that reflect several factors like the kind of communication they are engaging in, stages of language development, and strategies that the child has used to learn the language, among others. In the context of this study, Kiswahili and English are both second languages to deaf students whose first language is sign language.

Findings and Discussion

Results have shown that 3864 errors were committed by all deaf students in written Kiswahili and English. Table 1 below summarizes such language errors.

Table 1: Summary of Errors Committed

Language Error	Syntax	Morphology & Orthography	Phonology	Lexical/Semantic
Amount	2378	746	306	178
Percent	61.5	19.3	7.9	4.6

Analysis of errors from Table 1 indicates that syntax was the most difficult level with 2378 errors. At this level, most students were found to face difficulty in agreement and tense conjugation. However, 178 errors were found in diction and contextualized meaning. In Morphology and orthography, 746 errors were found in

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3   The **MAIN (Multilingual Assessment Instrument for Narratives)** is an instrument for assessing narrative skills in children who acquire one or more languages from birth.

affixal marking, spelling, and orthographic systems while in phonology common errors were in sound patterning and substitutions. In general, all students were identified to produce unintelligible written text as opposed to intelligible signing.

These data inform that most students were affected by language transfer in which their written language structure corresponded with signing patterns. This transfer is what is called in linguistics *"negative transfer"* which is caused by structural differences between sign language and spoken Kiswahili/English (Jack, 2022). Marschark and Knoors (2014, p.164) have also affirmed about difficulties deaf students face in a written language. In their reading project, they found that deaf students had challenges in recognizing words, understanding word meaning, and grammar while challenges in grammar were leading (Marschark & Knoors, 2014, p.171). Figure 1 below describes a summary of their results.

Knowledge

TOP Conceptual Strategic

(words, things) (problem-solving)

metagognitive/metalinguistic

Discourse structure
Grammar
Vocabulary
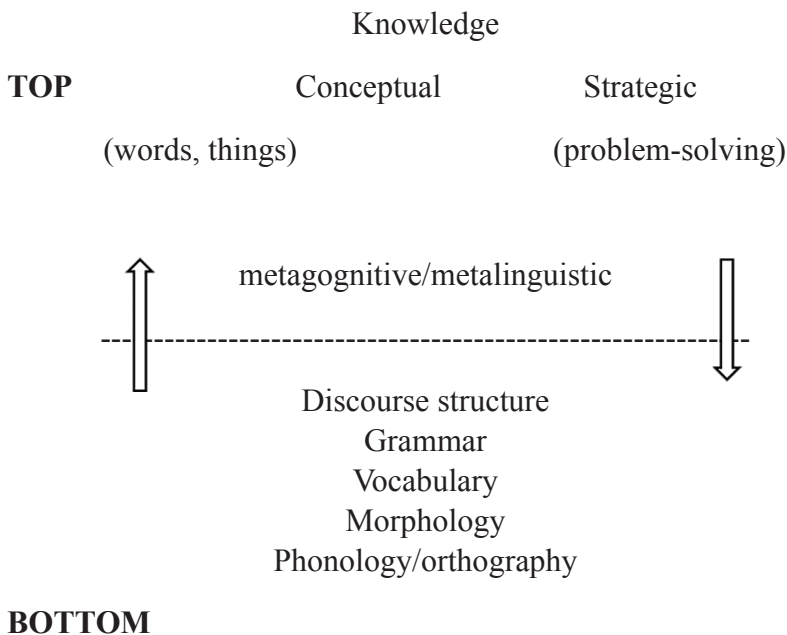Morphology
Phonology/orthography

BOTTOM

Figure 1: *Language complexity levels adapted from Marschark and Knoors (2014, p.164)*

Figure 1 indicates that deaf students have relative difficulties in grammar and discourse structures which then affect their understanding of things or words and/or problem-solving skills. Generally, language building is done in the context of use, and this underscores the need to adopt appropriate language drills.

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Bilingual education has been advocated for its strengths in language drills among the deaf. Bilingual education recognizes both deaf persons as a linguistic-cultural group (Dammeyer & Marschark, 2016, p. 395) and the need of using spoken and sign(ed) languages for communication options among the deaf. In Tanzanian contexts, the emphasis has been put on the possibility of using written English/Kiswahili by deaf students (Mkama, 2021a). Deaf students in Form Two have been shown to have committed most errors in written languages rather than in sign language. Such errors are attributed to unsupportive linguistic-cultural environments for their learning. At the bottom line, the model takes an assertion that the deaf community is the linguistic-cultural group, hence orients hearing persons to the deaf culture and deaf history as is elaborated in Figure 2 below.
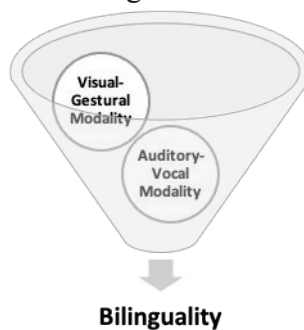

Figure 2: *The bilingual Model adopted and modified from Mkama (2021a).*

In earlier research, Mkama (2021a) & Mkama (2021b) argued for the usefulness of Bilingual deaf education in creating an inclusive school culture in which deaf students feel welcomed and protected. As introduced earlier, the Bilingual model considers the co-existence of signed language and spoken languages, in the Tanzanian context – Kiswahili and English. Thus, both language modes are co-currently fused into schools' linguistic repertoires and thus forming a bilingual school community. In this regard, instruction in sign language will enable hearing students to learn sign(ed) language and be able to apply appropriate modalities in communicating with deaf students, hence breaking the communication barrier between them. In this aspect, therefore, students get exposed to the use of TSL and signed language dialects in various school contexts, through which they can form groupings of friendships. This situation is referred to as bilinguality – a situation in which two language systems are integrated within the context of language use.

Bilinguality offers a practical response to linguistic diversity and plurality in deaf education by creating an inclusive culture that responds to deaf students' learning concerns. With bilinguality, students can form meaning from their linguistic experiences – both signed and spoken and can thus form a community of practice in which the value of diversity and plurality is considered. In supporting this,

Swanwick (2017, p. 83) emphasizes that bilinguality gives a space for bilingual students to migrate between codes and be able to learn such codes. These students use them in social contexts. In addition, bilinguality allows students to be flexible to use their language resources in order to maximize their communication and understanding. Figure 3 describes the role of bilinguality in the promotion of second language learning.
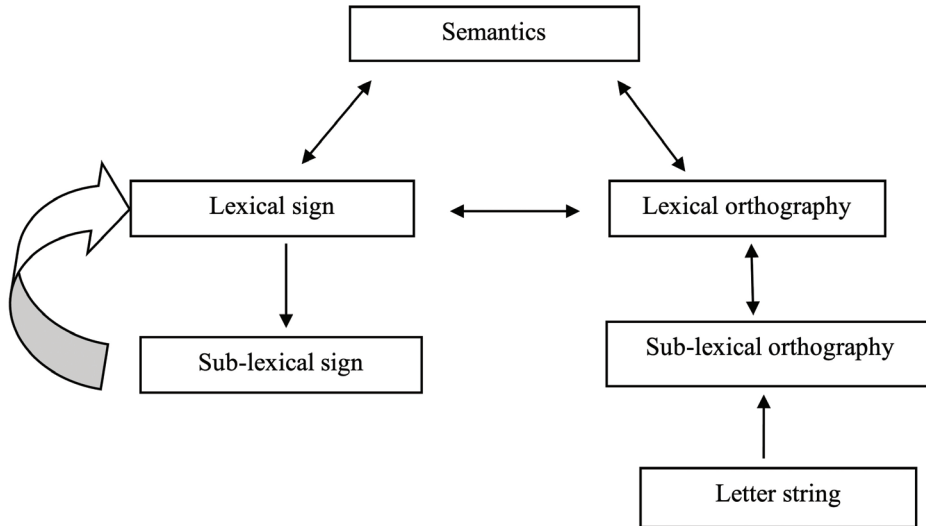

Figure 3: *Sign activation during visual word recognition by bilingual children: Adapted from Ellen & Marcel (2014, p. 82)*

With the language activation model above, Ellen and Marcel (2014, p. 82) have proposed the interconnectivity of two language modes. They have shown how one mode influences the activation of the brain in understanding the other mode. In their research which involved children of 9 years who were exposed to Dutch and NGT (Sign Language of the Netherlands), Ellen & Marcel (2014) identified the relatedness of spoken and sign language in brain activation and meaning formation. They noted:

> There is a very positive influential relationship between written word recognition and co-activation of sign phonology in Deaf children. …once lexical orthography is activated (i.e., recognizing the letter string d-o-g as the orthographical representation of the word dog), the sign translation of the activated written word is also activated (i.e., the sign DOG) through the direct link of their shared semantic features. Similarly, once the lexical sign is activated, activation feeds down to the composing sub-lexical sign elements (i.e., handshapes, movement, location, direction, and orientation features)" (p. 82).

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With language activation, other sign lexical features that may share a semantic field may be co-activated as well (Marschark & Lee, 2014). Their findings are relevant to the current study which shows low abilities in written second languages among deaf students. However, despite the challenges of this model, of importance is the trans-languaging aspect of bimodality that has been influenced by bimodal bilingualism in deaf education.

Conclusions

Language is of great contribution to other developmental areas like thinking, reasoning, and problem-solving. The findings of this study have indicated that all deaf students who were involved in the study had several errors in their language performance, hence making their written communication unintelligible. Being born in hearing families and living with speaking societies, deaf students have been linguistically disadvantaged in several ways including inadequate exposure to sign language environments. This situation has affected their sign language development, hence consistently developing both unmarked and unstandardized signs. Deaf students in secondary education in Tanzania have evidenced it, hence calling for appropriate language interventions including designing language drills and learning mechanisms to improve their literacy levels. Adequate levels of language competence enable students to understand the text and express their thoughts intelligibly in the respective language; the vice versa is also true. The adoption of inclusive education in Tanzania paves a significant milestone for the adoption of language programmes for enhancing language competence among deaf students. This paper has highlighted the need for the promotion of language skills along with teaching/learning.

Recommendations

The study has highlighted the status of literacy among deaf students in secondary education in Tanzania and unpacked its consequences in the light of producing intelligible texts. To assist them to develop literacy, this study makes the following recommendations.

i.   Language teachers ought to apply more reading exercises, and this will be of advantage to deaf students in increasing their language lexicon.

ii. Language teaching approaches should be quite distinct in terms of engaging students to develop language skills. Hence, approaches like role play, storytelling, direct translation, and total language immersion should be mostly applicable.

iii.   Schools ought to enhance bilinguality in all aspects of learning like classroom pedagogy, assessment, and communication. Bilinguality is built through a Bilingual-Bicultural programme.

iv.   To complement this study and have a holistic approach to deaf education, further research may be done in the areas of classroom communication, pedagogy, and assessment and evaluation which are essential for promoting learning among deaf students.

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