

ADVANCES IN GLOBAL EDUCATION AND RESEARCH

GLCER'21

VOLUME 4

Editors:

Dr. Wayne B. James

Dr. Cihan Cobanoglu

Dr. Muhittin Cavusoglu



Co-Editors

Dr. Wayne James, University of South Florida, USA

Dr. Cihan Cobanoglu, University of South Florida, USA

Dr. Muhittin Cavusoglu, Northern Arizona University, USA

ADVANCES IN GLOBAL EDUCATION AND RESEARCH: VOLUME 4

ISBN 978-1-955833-04-2

****Authors are fully responsible for corrections of any typographical, copyrighted materials, technical and content errors.***

Co-Editors

Dr. Wayne James, University of South Florida, USA

Dr. Cihan Cobanoglu, University of South Florida, USA

Dr. Muhittin Cavusoglu, Northern Arizona University, USA

ISBN 978-1-955833-04-2

© USF M3 Publishing 2021

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed. The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use. The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This imprint is published by USF M3 Publishing, LLC

The registered company address is University of South Florida, 8350 N Tamiami Tr, Sarasota, FL 34243 USA.

Assistant Editor

Dr. Alia Hadid, University of Rhode Island, USA

Editor Assistants

Zahra Alrushdy, Bahcesehir University, Turkey

Gokhan Sener, Necmettin Erbakan University, Turkey

Abraham Terrah, University of South Florida, USA

****Authors are fully responsible for corrections of any typographical, copyrighted materials, technical and content errors.***

Accessing School Content Using Multiple Languages in Early Childhood

Selina L. P. Mushi

College of Education
Northeastern Illinois University, United States

Abstract

This study examined use of multiple languages in learning school content in early childhood. Data were collected from 25 classrooms in five schools in Kilimanjaro, Arusha and Dar es Salaam regions in Tanzania. The data collection process included structured classroom observations of teacher-student interactions, parent questionnaire responses and interviews notes, and teacher interview notes. These sets were analyzed separately and then triangulated to determine convergence of the study findings. Statistical Package for the Social Sciences (SPSS 15.0) was used to summarize numerical data and to correlate variables (age, gender, number of languages spoken, school location and performance ratings by parents). Content analysis was used to analyze descriptive data. Existing assessment data on the performance of multilingual children in selected subjects were also examined to provide understanding of how well the multilingual children mastered class content in relation to the performance of their monolingual peers. The study results revealed school-related, and family-related factors that supported use of multiple language in learning the school curriculum content.

Keywords: language, culture and classroom learning, natural multilingualism, learning in multiple languages, educating young children in Tanzania

Recommended Citation: Mushi, S. L. P. (2021). Accessing school content using multiple languages in early childhood. In W. B. James, C. Cobanoglu, & M. Cavusoglu (Eds.), *Advances in global education and research* (Vol. 4, pp. 1–13). USF M3 Publishing.
<https://www.doi.org/10.5038/9781955833042>

Introduction

Language and thought processing are inextricably linked. From the time children begin to acquire language, predispositions of which are present by the 29th week of gestation (Eliot & Syc, 2008) all aspects of their mental development are affected (Piper, 1998). Language development is rooted in the cognitive maturity process. A certain level of cognitive development has to be reached before the first word is uttered (Owens, 2008; McLean, & Snyder-McLean, 1978; Bowerman, 1975). But it also happens that children with typical cognitive development may lack language; or children with non typical cognitive development may acquire language, or even multiple languages with considerable fluency. Children on the mild end of autism spectrum demonstrate this fact.

To express thought, a child draws from the language faculty in the brain and projects the intended or experienced thought onto someone else's attention by use of verbal production, physical reaction or gesture. In typically developing children, verbal language is the primary mode of communication, which is also an indication of cognitive functioning. Language as an important part of early cognitive abilities necessitates research on the development and use of multiple languages at an early age. The rapid development of language in the early years (Ferjan & Kuhl,

2017; Kuhl, 2010; Eliot, 2009; Eliot & Syc, 2008) raises important questions about mastering two or more language systems at the same time in childhood. In the effort to educate young children effectively, the interaction between multiple languages and the children's learning of the school curriculum becomes an area of sustained research interest. The centrality of verbal language use as a medium for learning school curricula calls for clearer understanding of how young children develop and use two or more languages, and how such children function in the school curriculum.

Research on school performance has tended to show bilingual and multilingual children performing at lower rates compared to English monolingual children (Paradis, 2005; Hernandez, Bates, & Avila, 1994) even though some studies have found no difference (Karlson, et al, 2015), and more recent research has found some advantages for learning in multiple languages as well as in children's performance (Schimbeck & Rao, 2020; Hofer & Jessner, 2019; Jorden et al, 2018; Armstrong & Rogers, 1997). An experiment carried out by Liberman et al, (2017) showed that exposure to multiple languages enhanced communication skills in infancy. While the research base on benefits of multilingualism in early childhood is increasing in some parts of the world, parents in some developing countries tend to push their children to learn English, and they pay large sums of money for this purpose (Mushi, 2015). The parents believe that mastering English at an early age is the only path to academic success. Obviously, a multilingual child speaks and understands multiple languages. This is the definition that guided this study, but which has not always been used in research on multilingualism and school learning

Literature Review

This study is based on three main conceptualizations surrounding early language development and learning. First, neuroscience has shown that young children need exposure to stimulating environments to help wire their brains (Liberman et al, 2017; Berk, 2014; Eliot, 2009, 1999). Secondly, most children are capable of learning two or more languages with no cognitive delays (Buse et al, 2020; Hofer & Jessner, 2019; Petito et al, 2001). Thirdly, truly multilingual children acquire the multiple languages naturally within their environments, and use the languages for fulfilling their day-to-day needs, including school learning.

According to Piaget's constructivist approach to learning, children construct their own learning by interacting with their immediate environments, and in the process, use and develop language as a "by-product" of the interaction. As children learn the curriculum content in school, they inevitably draw from the learning they have already acquired as a result of interacting with their environments. Neuroscience and constructivism both show that language development is an important cornerstone for learning at an early age. Vygotsky's social-cultural perspective on learning shows that children need and use both their immediate environments, as well as parental scaffolding to learn the languages that they need to function effectively within their contexts. Parental influence is strong, especially when parents function as equal partners with teachers (Blair & Haneda, 2021). In addition, parental support is not only effective in children's learning of multiple languages, but also in changing the linguistic ecology (Buse, et al, 2020; Curdt-Christiansen & Wang, 2018).

Methods

This study was part of a larger research project that was designed to explore multilingualism and the school curriculum, with emphasis on learning at home, at school and in the wider community. The larger study included more data from parents, college/university faculty, and examines learning in a broader context. In this study, focus was on the multilingual children's learning and classroom performance.

Sample

Sampling of study participants was targeted at children who already spoke two or more languages fluently. While all school children in Tanzania are fluent in Kiswahili, the national language and formal medium of instruction, some children are also fluent in their native languages. Typically, all children in public schools are English Language learners.

A total of 107 children aged 5-12 years in 10 of the 25 classrooms were studied in two of the three regions in Tanzania, namely Arusha, and Kilimanjaro. There were no multilingual children studied in the 2 Dar es Salaam schools. The monolingual children (fluent in Kiswahili only) in the 10 classrooms were not directly studied. However, they provided a good basis for comparison of classroom performance with that of their multilingual peers in previously administered tests and examinations. Parents of the multilingual children and classroom teachers participated in the study

Data Collection

Data were collected by means of parent questionnaire and focused interviews, structured classroom observation and tally sheets completed by research assistants, teacher interviews as well as examination of assessment information as secondary data. Research assistants were trained to help collect data. They interviewed parents and collected the daily tally sheets from classroom teachers. Event sampling and time sampling sheets were used. Working with classroom teachers, the research assistants identified, and highlighted the performance rankings of multilingual children on summary sheets (class lists) provided by classroom teachers. The summary sheets listed children's names and performance in four subject areas, i.e., English, Kiswahili, Math and Science. These subjects were considered key subjects in the school curriculum. The multilingual children's names were then removed from the list, leaving gender as the only identifier.

Scores or letter grades on tests/examinations previously administered by classroom teachers were analyzed to determine the performance trends of the multilingual children in comparison to their monolingual peers. These previously obtained scores or letter grades provided an objective way to examine if the multilingual children were able to master the school curriculum content as well as their monolingual peers did. The monolingual peers spoke only the formal medium of instruction, which was Kiswahili. All children in the 25 classrooms were English Language learners. All tests/examinations were administered in Kiswahili, except in the case of English as a subject.

Data Organisation and Analyses

Five sets of data were organized and analyzed separately. In the larger study, the Statistical Package for the Social Sciences (SPSS 15.0) was used to correlate multiple variables including age, gender, location of school, number of languages spoken and performance ratings by parents

(from the 91 questionnaires). In this report, the data sets analyzed for the 107 multilingual children included: parents' responses to questionnaire items, parents' interview responses, teachers' class observation tallies and notes, teachers' interview responses, and previously existing test scores or letter grades (secondary data).

Content analysis was used to extract key themes from the questionnaire and interview responses as well as classroom observation notes from teachers. Numerical data (tallies) from the structured classroom observation by teachers were compiled and calculated into percentages. After each set of data was analyzed, triangulation of findings was performed to highlight coherent findings from the different sets of data.

Assessment data, mostly in the form of test scores were obtained from 10 of the 25 classrooms studied. The scores or letter grades were from previously completed tests and examinations. Performance rankings of multilingual children were highlighted on the score sheets (test/examination result sheets). These rankings were then compared to those of the monolingual children in the same classrooms, who took the same tests or examinations. Each list of test scores and rankings in the four subject areas studied (Math, Science, Kiswahili and English) was an intact class/group. Analyzing scores from intact groups was necessary to provide a strong basis for determining relative performance of multilingual children (compared to their monolingual peers) given the same content, teacher, teaching, context and time.

Findings

The study findings revealed factors that triggered and supported use of multiple languages in children. These findings shed light on how children used their fluency in multiple languages in their thinking skills, and how the multilingual children performed in the school curriculum.

Factors That Triggered and Supported Use of Multiple Languages

Parent questionnaires and teacher interviews revealed factors that triggered use of, and fluency in, multiple languages at an early age. The factors included having multilingual parents, engaging in play activities with multilingual peers, interacting with grandparents and participating in cultural activities. Others factors included reading materials written in different languages, children's play activities that involved writing games and songs in Kiswahili and in English, and the language policy that emphasized both languages. Having role models who used multiple languages, and having friends who spoke the different languages were found to be supportive factors.

Statistical Data

Statistical data from the parent questionnaire in the overall study yielded significant correlations between sets of variables including grade level and age of child, grade level and performance rating in English, number of languages spoken and performance rating in Math, Science and Kiswahili, as well as performance rating in Math and performance rating in Science, Kiswahili and English. Even though the correlation coefficients were found to be significant (between $P = 0.01$; and $P = 0.05$), they spanned the lower end to mid-range except for the coefficient between grade level and age of child which was $r = 0.727$ ($P = 0.000$). The statistical analysis provided a general conceptualization of the data from the parent questionnaire, which involved 91 multilingual children in the overall study. The statistical analysis did not include the 16 additional

questionnaires received later, after initial results of the study. Unlike in the overall study, this research report accrues heavily from children's class performance rankings in four subjects, i.e., Math, science, Kiswahili and English, as well as from the parent interview data, teacher interview and observation data. Descriptive results from the entire set of parent questionnaire (107 in total) are also provided.

Multilingual Children's Performance in English, Kiswahili, Math, and Science

The most prominent findings were from the test scores used as secondary data. Classroom teachers were requested to provide summary sheets that listed children's performance on previous tests and exams in Math, Science, Kiswahili and English. Teachers were asked to identify multilingual children in their classrooms. Research assistants highlighted each multilingual child and recorded the gender, scores (numerical value or letter grade), and rank in Math, Science, Kiswahili and English on a separate sheet. The researcher compiled the data into tables for each of the 10 classrooms which provided the secondary data. The summary tables below provide performance ranking of each multilingual child in Math, Science, Kiswahili and English, and also the overall rank for the four subjects combined. The scores provided were from Schools 3, 4, and 5 in the study. The performance rankings are organized according to school and grade. A total of five groups (grades) were compiled from School 3. In all five groups, the multilingual children's percentile ranks ranged between 96th (highest performance) and 70th (lowest performance), except for one child whose percentile rank was 40th in Grade 1B. Table 1 shows more detailed performance ranking data from School 3, grades:1A, 1B, 2, 3 and 4.

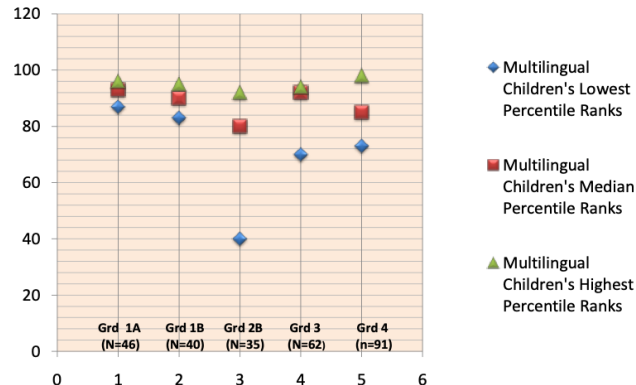
Table 1: Performance of School 3 Multilingual Children Based on Test Scores (Secondary Data)

Student	Performance ((Letter Grades)				Class Rank	Class Percentile Rank
	Math	Science	Kiswahili	English	All 4 Subjects	All 4 Subjects
School 3 Grade 1A (Out of 46)						
1. (female)	A	B	A	A	2nd	96th
2. (female)	A	A	B	B	3.5th	93rd
3..(male)	B	A	B	B	3.5th	93rd
4. (male)	B	B	B	C	6th	87th
School 3 Grade 1B (Out of 40)						
1. (female)	A	B	A	A	2nd	95th
2. (male)	B	A	B	B	4th	90th
3. (male)	B	B	B	B	7th	83rd
School 3 Grade 2B (Out of 35)						
1. (female)	A	A	A	A	3rd	92nd
2. (female)	A	A	C	A	7th	80th
3. (male)	C	D	B	D	21st	40th
School3 Grade 3 (Out of 62)						
1. (female)	B	A	B	B	3rd	94th
2. (female)	B	B	B	B	5th	92nd
3. (female)	C	B	B	C	18.5th	70th
School 3 Grade 4 (Out of 91)						
1. (male)	A	A	A	B	2nd	98th
2. (female)	B	A	A	C	9.5th	90th
3. (female)	A	B	B	B	14th	85th
4. (female))	A	B	B	C	17.5th	81st
5. (male))	C	B	B	C	24.5th	73rd

Although performance data were collected only for the multilingual children, the class rankings provide a clear indication that the multilingual children performed well, and were at the upper end of their respective class rankings based on their composite scores in the four subjects. The total number of children in the five classrooms in School 3 was 274. A graphical representation further summarizes the data from School 3 as shown in Figure 1. As can be observed in Figure 1, 14 of

the 15 multilingual children in School 3 performed within the upper 30% of their respective classes/groups.

Figure 1: Multilingual Children’s Composite Ranking (Math, Science, Kiswahili, and English) From School 3



Performance data collected from School 4 (Grade 2) on the four subjects (Math, Science, Kiswahili and English) were in the form of percentage scores. Performance rankings for the multilingual children ranged from a 96th percentile (highest) to 17th percentile (lowest), with a median percentile rank of 84, which shows that half the number of multilingual children was concentrated at the upper portion of the performance spectrum (85th-96th percentile). Four of the 7 multilingual children in the upper portion performed above 90th percentile. Four of the 7 multilingual children in the lower performance spectrum ranked above 66th percentile. In total, 12 of the 15 multilingual children in Grade 2 in School 4 ranked within the upper 30 percent of the class total of 89 children. Only 2 multilingual children performed below the 50th percentile. There were no gender differences observed. More details of the performance data are provided in Table 2.

Table 2: Performance of School 4 Multilingual Children Based on Test Scores (Secondary Data)

Student	School 4 Grade 2 Test Scores (%)				Class Rank Out of 89 All 4 Subjects	Class Percentile Rank All 4 Subjects
	Math	Science	Kiswahili	English		
1. (male)	96%	40%	95%	95%	4th	96th
2. (female)	84%	60%	80%	85%	5th	94th
3. (female)	72%	80%	75%	60%	6th	93rd
4. (male)	88%	55%	80%	60%	8th	91st
5. (male)	64%	65%	70%	70%	11th	88th
6. (male)	64%	79%	90%	40%	12th	87th
7. (female)	64%	55%	95%	65%	12th	87th
8. (male)	36%	82%	85%	70%	14th	84th
9. (male)	72%	50%	85%	70%	17th	81st
10. (male)	52%	80%	70%	60%	23rd	74th
11. (female)	80%	35%	70%	50%	29th	67th
12. (female)	64%	65%	75%	40%	30th	66th
13. (female)	64%	45%	75%	45%	42nd	53rd
14. (male)	60%	50%	35%	35%	55th	38th
15. (male)	60%	14%	50%	30%	74th	17th

Performance data from the third grade in School 4 showed a similar trend. The third grade had 75 children, among whom 22 were multilingual. Percentile ranks for the multilingual children ranged from 99th (highest) to 5th (lowest) with a median percentile rank of 80, which means that half of the high performing multilingual children were concentrated between 81st and 99th percentile. Overall, 15 of the 22 multilingual children performed within the upper 30 percent of the group of 75 children. Seven of the 11 multilingual children performing in the lower spectrum ranked

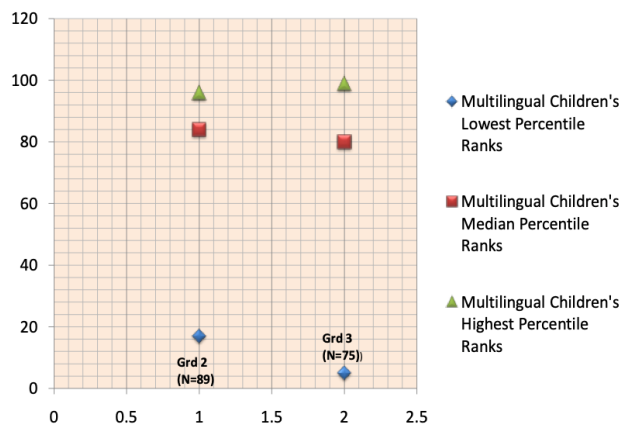
between 75th and 61st, while 3 performed below 50th percentile. There were no gender differences observed. Table 3 provides more detailed data.

Table 3: Performance of School 4 Multilingual Children Based on Test Scores (Secondary Data)

Student	School 4 Grade 3 Test Scores (%)				Class Rank Out of 75	Class Percentile Rank
	Math	Science	Kiswahili	English	All 4 Subjects	All 4 Subjects
1. (female)	95%	80%	100%	92%	1st	99th
2. (female)	95%	80%	100%	85%	2nd	97th
3. (male)	100%	85%	100%	68%	3rd	96th
4. (female)	85%	85%	100%	76%	4th	95th
5. (female)	95%	75%	84%	80%	5th	93rd
6. (female)	95%	70%	100%	64%	6th	92nd
7. (female)	95%	70%	100%	64%	6th	92nd
8. (female)	90%	70%	96%	72%	9th	88th
9. (male)	90%	80%	96%	60%	11th	85th
10. (female)	85%	80%	80%	72%	12th	84th
11. (female)	85%	75%	100%	56%	13th	83rd
12. (female)	70%	70%	100%	64%	18th	76th
13. (female)	80%	90%	96%	78%	19th	75th
14. (male)	70%	70%	100%	68%	20th	73rd
15. (female)	90%	60%	85%	64%	21st	72nd
16. (female)	75%	55%	92%	48%	23rd	69th
17. (female)	75%	60%	100%	44%	29th	61st
18. (male)	65%	60%	76%	76%	29th	61st
19. (male)	70%	65%	92%	40%	32nd	57th
20. (male)	50%	60%	92%	40%	40th	47th

In School 4, only 5 of the 37 multilingual children performed below the 50th percentile, 2 in Grade 2 and 3 in Grade 3 (as shown in Table 2 and Table 3). The performance data from School 4 are further summarized as shown in Figure 2. The median performance rank of 84 in Grade 2 shows that half of the multilingual children performed within the upper 16 % of the group of 89 children. In Grade 3, half of the multilingual children performed in the upper 20 % of the group of 75 children.

Figure 2: Multilingual Children’s Composite Ranking (Math, Science, Kiswahili, and English) From School 4



The data collected from School 5 are presented in Tables 4, 5 and 6. Table 4 presents test scores from Grade 2, which had 14 multilingual children and a class total of 65 children. The data were scores out of 100, i.e., percentages. The highest percentile rank for the multilingual children was 95; the median rank was 53 and the lowest percentile rank was 2. Half of the multilingual children ranked higher than the 63rd percentile, and the other half ranked below the 50th percentile. There were no gender differences.

Third Grade data in School 5 are presented in Table 5. There were 15 multilingual children among a class total of 75. The highest performer was ranked at the 96th percentile; the median performer was ranked at the 79th percentile, and the lowest at 3rd percentile. Half the number of multilingual children ranked higher than 81st percentile in performance. Four multilingual children ranked below the 50th percentile. There were no notable gender differences.

Table 4: Performance of School 5 Multilingual Children Based on Test Scores (Secondary Data)

Student	School 5 Grade 2 Test Scores (%)				Class Rank Out of 65	Class Percentile Rank
	Math	Science	Kiswahili	English	All 4 Subjects	All 4 Subjects
1. (female)	100%	100%	90%	70%	3rd	95th
2. (male)	80%	80%	80%	70%	9th	86th
3. (male)	70%	80%	70%	60%	11th	83rd
4. (male)	70%	90%	90%	80%	14th	78th
5. (male)	80%	100%	40%	60%	17th	74th
6. (female)	50%	90%	50%	40%	21st	68th
7. (female)	90%	40%	70%	30%	24th	63rd
8. (female)	70%	60%	40%	70%	37th	43rd
9. (female)	50%	80%	40%	30%	42nd	35th
10. (female)	40%	70%	50%	10%	44th	32nd
11. (male)	70%	30%	40%	70%	45th	31st
12. (female)	90%	70%	50%	--	48th	26th
13. (male)	90%	20%	10%	30%	56th	14th
14. (male)	50%	50%	30%	10%	64th	2nd

Table 5: Performance of School 5 Multilingual Children Based on Test Scores (Secondary Data)

Student	School 5 Grade 3 Test Scores (%)				Class Rank Out of 75	Class Percentile Rank
	Math	Science	Kiswahili	English	All 4 Subjects	All 4 Subjects
1. (male)	70%	85%	90%	85%	3rd	96th
2. (female)	75%	100%	80%	60%	3rd	96th
3. (male)	75%	95%	100%	55%	5th	93rd
4. (male)	55%	90%	90%	50%	8th	89th
5. (male)	65%	85%	90%	70%	8th	89th
6. (female)	50%	90%	80%	55%	12th	84th
7. (female)	65%	55%	85%	75%	14th	81st
8. (female)	55%	85%	80%	65%	16th	79th
9. (male)	35%	100%	90%	65%	18th	76th
10. (female)	80%	65%	75%	80%	20th	73rd
11. (female)	60%	60%	85%	45%	28th	63rd
12. (female)	35%	45%	70%	25%	46th	39th
13. (male)	30%	25%	75%	30%	51st	32nd
14. (male)	30%	25%	50%	40%	60th	20th
15. (male)	65%	5%	25%	15%	73rd	3rd

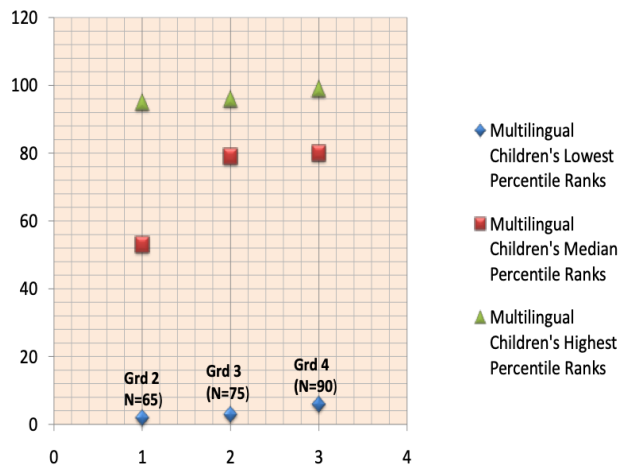
Fourth Grade data in School 5 are presented in Table 6. The data were reported as letter grades. There were 90 children in the fourth grade, of whom 23 were multilingual. The highest multilingual performer was ranked at 99th percentile; the median performer was ranked at the 80th percentile, and lowest performer at the 6th percentile. Nineteen of the 23 multilingual children (about 83%) in Grade 4 performed at the 51st percentile or higher, with 12 of them ranking at or higher than the 80th percentile. Only 4 of the 23 multilingual children ranked below the 50th percentile. There were no gender differences.

Multilingual children in School 5 performed well, with over 50% of them ranking within the upper 37% of the group in grade 2; within the upper 21% of the group in grade 3, and within the upper 20% of the group in grade 4. Out of a total of 52 multilingual children (22% of the entire group of 230 children for whom performance rankings were reported in School 5), only 15 ranked below the 50th percentile. The multilingual children's highest percentile rankings were between 99 and 95, while their median percentile rankings were between 80 and 53 as shown in Figure 3.

Table 6: Performance of School 5 Multilingual Children Based on Test Scores (Secondary Data)

Student	School 5 Grade 4 Performance (Letter Grades)				Class Rank Out of 90	Class Percentile Rank
	Math	Science	Kiswahili	English	All 4 Subjects	All 4 Subjects
1. (male)	B	B	A	A	1st	99th
2. (female)	B	B	A	A	2nd	98th
3. (female)	A	C	A	B	3rd	97th
4. (male)	A	C	B	A	4th	96th
5. (male)	C	B	B	A	4th	96th
6. (female)	A	A	B	B	7th	92nd
7. ((female)	B	B	B	A	8th	91st
8. (female)	C	B	B	B	11th	88th
9. (male)	B	A	C	A	11th	88th
10. (male)	B	B	B	B	13th	86th
11. (female)	C	A	B	C	16th	82nd
12. (male)	D	A	A	B	18th	80th
13. (female)	A	C	B	B	19th	79th
14. (male)	B	B	C	B	19th	79th
15. (female)	B	B	B	B	23rd	74th
16. (male)	C	C	C	B	23rd	74th
17. (male)	B	B	A	C	26th	71st
18. (male)	C	B	B	C	31st	66th
19. (male)	D	B	B	C	44th	51st
20. (female)	C	D	C	C	54th	40th
21. (male)	D	C	D	C	65th	28th
22. (male)	D	E	D	D	80th	11th
23. (male)	E	D	E	E	85th	6th

Figure 3: Multilingual Children’s Composite Ranking (Math, Science, Kiswahili, and English) From School 5



Discussion

As children go about their everyday life, language learning becomes a necessary tool to make sense of their world. Young children are naturally attracted to learn new things. This study revealed that children naturally used the languages they spoke, and this was encouraged by parents and supported by teachers. If one language did not meet the needs of the moment children quickly changed to another word, or phrase, or sentence that could capture the intended meaning. Children's focus was not on the language but on the message they wanted to communicate. While this natural learning may sound obvious to anyone who has had exposure to working with young children, it is quite a different issue when the children naturally function in multiple languages. Children are not always encouraged to learn and use all the languages they speak, especially in contexts where exposure to multiple languages is minimal or shunned. In non-supportive contexts,

using multiple languages can be perceived as a barrier to effective learning. The findings of this study shed light on important factors in the education of young children who happen to bring several languages to the school curriculum. The factors are discussed in the sections that follow.

Significance of the Performance Trends

The test data were not initiated by the study. The study only utilized test scores that were available as secondary data at the time of data collection. Some of the data dated back several months. Given the fact that the teachers had not singled out multilingual children prior to the study, those test scores (percentages and letter grades) provided an informative performance trend that had not been explored before. It came as a surprise to the teachers that overall, the multilingual children performed better than most monolingual children. It is important to note here that the "monolingual" children spoke Kiswahili fluently, and were just beginning to learn English. These children did not speak an indigenous language. Kiswahili was therefore their only "mother tongue". In other words, they were fluent only in Kiswahili. Even though the context and social milieu was the same or similar, these children had not been exposed to their ancestors' languages enough to understand and speak those languages. These "monolingual" children did well in school; however, it turned out that majority of their multilingual peers did better as a group.

Given the design of the study and the small numbers of multilingual children studied in each class/group, it is difficult to determine if fluency in the multiple languages in itself accounted for their success in learning school content. However, given the consistency of higher performance rankings of the multilingual children in the 10 classes in 3 schools that were located in different regions, it is obvious that fluency in the multiple languages and use of those languages in school learning was an important factor in the children's higher performance in Math, Science, Kiswahili and English. At the least, the multilingual children's performance in the four subjects (English, Kiswahili, Math and Science) provides strong evidence that speaking multiple languages did not interfere with learning school content. Children effectively accessed school content using multiple languages. At the most, these findings are an indication that multiple languages can provide an added advantage in school learning, given that teachers accommodate the languages in classroom learning.

Summary and Synthesis of Findings

This study examined factors that contributed to children's use of multiple languages, and how fluency in multiple languages was linked to thought processes, school learning and performance. The study also revealed some perceived disadvantages of using only one of the languages children spoke. Parental use of multiple languages, interaction with peers and the extended family, and classroom implementation of the language policy were the main factors that contributed to, and supported, children's abilities to use multiple languages. The different sets of data converged to show positive learning for children using multiple languages in their everyday functioning. The multilingual children did not feel constrained to use only one language in their classrooms. Their teachers allowed some flexibility even though the language policy required Kiswahili and English. Children expressed their thoughts and asked questions clearly in class using different languages. This was perceived by teachers and parents as an effective way to learn.

Test scores revealed multilingual children's high percentile rankings in the four selected school subjects (English, Kiswahili, Math and Science). They ranked mostly within the upper 30% tier of their respective groups/classrooms. To put these findings in clearer perspective, Table 7 provides a concise summary of the performance data.

Table 7: Summary Table of Performance Rankings

Category/Performance	Count	
Total Number of Children in the 10 Classrooms	668	100%
Number of Multilingual Children in the 10 classrooms	107	16% of 668
Number of Multilingual Children Ranking in Performance in the Upper 30%	87	81% of 107
Number of Multilingual Children Ranking in Performance in the Lower 70%	20	19% of 107

Out of a total of 668 children in the 10 classrooms, 107 were multilingual. Out of the 107 multilingual children, 87 children (81.3%) performed within the upper 30% of their respective groups. In other words, 87 out of the 668 children (16%) who happened to be multilingual, performed within the top 30% of the entire group. Considering the fact that fluency in multiple languages was a common factor among the children across the 10 classrooms located in three schools, in three different regions, it is obvious that this factor had a role to play in the children's learning. It is therefore imperative to explore in more detail the role of multiple languages in learning content in the school curriculum. Parents thought that it was a disadvantage to force children to utilize within the classroom only one of the languages they spoke.

Conclusions

The findings of this study highlight children's use of multiple languages in learning the school curriculum. Children needed all learning tools they had access to, both at home and at school, with the most important tool being the languages they spoke. Parents, the extended family and the overall social context played an important role in children's acquisition and use of multiple languages. The pre-determined school curriculum and language policy incorporated teacher flexibility that was supported by parents to help children learn to their highest potential. Priority was on making connections between the languages that embodied the child's early foundation for learning and the subsequent exposure to planned school curriculum.

Based on the results of this study, the perception that school content is very different from other learning outside class that children are exposed to prior to starting schooling is questionable at best. When children learn concepts from multiple perspectives using the languages they speak, they are more likely to compare the learning acquired through the different languages and even question any discrepancies. In other words, as young children approach learning of the same content using different languages and ways of understanding, they earn the advantage of having fuller exposure to the content, in a similar manner as one would have a more complete physical perception of an object viewed from different angles, compared to viewing the object from only one dimension. This research also provides more insight into the question whether multilinguals struggle with language control (Festman, 2021).

While test scores do not represent children's overall learning in any content area, they provide indication of whether children are grasping the basic content of what is being taught. The performance trend revealed in this study for multilingual children enriches the beginning of a new way to study and utilize multiple languages in the classroom. Multiple languages acquired naturally at an early age can provide additional perspectives for approaching learning. The young

children's fluency in multiple languages and the use of those languages in school learning were found to be useful assets. It was as if the children were functioning with multiple minds at the same time.

Implications for Further Research

This study involved 107 multilingual children in three schools in the Tanzanian context. These findings cannot be applied directly to contexts in which children are not fully multilingual. The definition of bilingual/multilingual children as children "who speak one language (L1) and are in the process of learning English and/or another language (L2)", does not apply to the findings of this study. The children studied in this research had acquired at least two languages naturally from birth, were fluent in all languages, and were learning English at the time of the study. The findings of this study call for more contextualized, more comprehensive research with randomized samples involving larger numbers of bilingual/multilingual children. Such research must include the role of language policy and its classroom implementation. As comprehensive, contextualized and well controlled studies grow in number, it will be possible to develop a research-based theory of the role of fluency in multiple languages in young children's school learning.

References

- Armstrong, P. W. & Rogers, J. D., (1997). "Basic Skills Revisited: The Effects of Foreign language Instruction on Reading Math and Language Arts". *Learning Languages*, 2(3), 20-31.
- Baum, D. R., & Hernandez, J. E., (2019). Early Childhood Education for All: A Mixed-Method Study of the Global Policy Agenda in Tanzania, Early Years: An International Journal of Research and Development, v39 n3 p260-275 2019. 16 pp
- Blair, A., & Haneda, M. (2021). Toward Collaborative Partnerships: Lessons from Parents and Teachers of Emergent Bi/Multilingual Students, *Theory into Practice*, (v60 n1 p18-27, 2021. 10 pp
- Berk, L. (2014). *Infants and Children: Pre-Natal Through Middle Childhood*, 7th edition, New York: Pearson
- Bowerman, M., (1974). Discussion of Summary: "Development of Concepts Underlying language", In R. Schiefelbusch & L. Lloyd (Eds.), *Language Perspectives: Acquisition, retardation and Intervention*, Baltimore, Park Press.
- Buse, V., Cenoz, J., & Dalmann, N. (2020). Addressing Linguistic Diversity in the Language Classroom: An Intervention Study with Primary School Children. *Language Learning*, v70 n2 p382-419 Jun 2020. 38 pp
- Curdt-Christiansen, X. L.; Wang, W. (2018). Parents as Agents of Multilingual Education: Family Language Planning in China. *Language, Culture and Curriculum*, v31 n3 p235- 254 2018. 20 pp
- Eliot, L., (2009). *Pink Brain, Blue Brain: How Small Differences Grow into Troublesome Gaps - and What we Can Do About It*. Boston: Houghton.
- Eliot, L., (1999). *What's Going on in There? How the Brain and Mind Develop in the First Five Years of Life*. New York: Bantam Books,
- Eliot, L. & Syc, S. (2008). "Language and the Brain". In Linda, Gilkerson and Rebecca Klein, (eds.). *Early Development and the Brain: Teaching Resources for Educators*. Erikson faculty Development Project on the Brain, Washington D.C. Zero-to-Three.
- Ferjan, R. N. & Kuhl, P. (2017). Bilingual Baby: Foreign Language Intervention in Madrid's Infant Education Centers, *Mind, Brain, and Education*, 11 n3 p133-143 11pp
- Festman, J. (2021) Learning and Processing Multiple Languages: The More the Easier? *Language Learning*, v71 suppl 1 p121-162 Mar 2021. (EJ1286692
- Hofer, B., & Jessner, U. (2019). Multilingualism at the Primary Level in South Tyrol: How Does Multilingual Education affect young learners' Metalinguistic Awareness and Proficiency in L1, L2, and L3? *Language Learning Journal*, v47 n1 p76-87 2019. 12 pp
- Hernández A.E., Bates E, Avila LX., "Sentence Interpretation in Spanish-English bilinguals: What does it mean to be in-between?" *Applied Psycholinguistics*, 1994, 15:417-66.

- Jasinska, K. K., Wolf, S., Jukes, W. C. H., & Dubeck, M. (2019). Literacy Acquisition in Multilingual Contexts: Evidence From Coastal Kenya. *Developmental Science*, v22 n5 e12828 Sep 2019. 17 pp
- Jorden's K., Van den Branden K., & Van Gorp K. (2018). Multilingual Islands in a Monolingual Sea: Language Choice Patterns During Group Work., *International Journal of Bilingual Education and Bilingualism*, v21 n8 p943-955 13pp.
- Karlson, L. C., Soveri, A., Rasanen, P., Karna, A., delate, S., Lagerstrom, E., Mard, L., Steffansson, M., Lehtonen, M. & Laine, M., (2015). "Bilingualism and Performance on Two Widely Used Developmental Neuropsychological Test Batteries", Open Access, Peer Reviewed Research Report, 15, 10.1371/journal.pone.01258567
- Khajayeva, Z.; Stambekova, A.; Gazikhanova, Z.; Smagulova, G.; Makhanbetjanovna, S. R. (2021). Primary School Teacher Candidates' Views on Multilingual Concepts: A Perspective of Learning Technology, *World Journal on Educational Technology: Current Issues*, v13 n1 p1-9
- Kuhl, P. (2010), *The Linguistic Genius of Babies*. PBS Video (Clip 10 minutes and 15 seconds long with 1.6 million views by Nov. 2014). Retrieved on March 5, 2016 from http://www.ted.com/_talks/patricia_kuhl_the_linguistic_genius_of_babies/.
- Lieberman, Z., Woodward, A., Keysar, & B. Kinzler, K. D. (2017). Exposure to Multiple Languages Enhances Communication Skills in Infancy. *Developmental Science*, v20 n1 11pp McLean L., & Snyder-McLean, L., (1978). *A Transactional Approach to Early Language Training*. Columbus, Ohio: Merrill, 1978.
- Mushi, S. L. P. (2015). *A Global Analysis of Education in the 21st Century: What Kinds of Schools Do We Need Today?* Lewiston-Lampeter: The Edwin Mellen Press.
- Mushi, S. L. P. (2002). Simultaneous and Successive Second Language Learning: Integral Ingredients of the Human Development Process, *Early Child Development and care*, Vol. 172 No. 4 pp.349-358.
- Owens, R. E. Jr., (2008). *Language Development: An Introduction*, Seven Edition, Toronto: Pearson
- Paradis, J., (2005). Grammatical Morphology in Children Learning English as a Second Language: Implications of Similarities with Specific Language Impairment. *Language Speech Hear Serv. Sch.*, 36:172-87
- Piper, T., (1998). *Language and Learning: the Home and the School Years*, 2nd edition, New Jersey: Merrill.
- Petito, L. A., Katerelos, M., Levy, B., Guana, K., Tetreault, K. & Ferraro, V., (2001). "Bilingual Sign and Spoken Language Acquisition from Birth: Implications for Mechanics Underlying Early Bilingual Language" Acquisition. *Journal of Child Language* 28, 453-486.
- Schimbeck, K. Rao, N. (2020). Similarities and Differences Across Countries in the Development of Executive Functions in Children: A Systematic Review, *Infant and Child Development*, v29 n1 e2164 Jan-Feb (2020) 25 pp