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RESEARCH PAPER

Effects of Mediated Learning Experiences for Hard of Hearing Children on Language Development

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Abstract

The present study aimed at determining the effect of an educational intervention in enhancing the Amharic language level of grade one students, particularly focusing on Mediated Learning Experiences (MLE) and instruction strategies from teachers. The intervention was applied in two comparatively equal sized government primary schools with 200 students divided equally between experimental and control groups. All of the students who took part were of low socioeconomic status. The key objective was to determine whether MLE would be able to bring about language development, in hearing impaired and hearing students. To collect data, the research performed audiometric tests for the diagnosis of hearing impairment, the application of sound level meters to ascertain ambient noise in classrooms, and standardized testing for ascertaining language capacity. Results showed that 13.5% of the test participants experienced some form of hearing impairment. Ambient noise in classrooms was found to be a significant auditory impediment to learning. The outcome was that the intervention based on MLE had a very positive impact on the language acquisition of the total group, as well as on both hearing and hard-of-hearing students. The intervention recipients also showed notable improvement in their Amharic language when compared to the control group. Ultimately, the innovative research highlights the accessibility and possibility of the MLE approach. In promoting active participation and cognitive interaction, MLE was a valuable practice to enhance disparate learners. The effective implementation of this approach in this setting reveals that flexibility and accommodativeness could be made. teaching methodologies an intrinsic part of the primary school syllabus to ensure equal and effective learning for all students regardless of their hearing or socio-economic requirements.

Keywords: Language skills, hard of hearing, mediated learning experiences, intervention, dynamic assessment

Introduction

The hard of hearing child typically faces extreme challenges in learning language due to lesser auditory input during critical development stages, which gets in the way of learning vocabulary and grammar. Their ability to participate in meaningful communication as well as academic attainment is also compromised. Fulfilling these developmental requirements requires instructional strategies beyond the traditional method and actively promote cognitive and linguistic growth through specially modified interaction. One such approach is Mediated Learning Experience (MLE), a model of intervention that emphasizes the presence of a human mediator, most frequently a parent, teacher, or caregiver, on a child's learning process through intentional, interactive communication. MLE has been promising in a variety of learning deficit populations, but its influence on language acquisition in hard of hearing children is poorly studied. This research aims to examine the manner in which MLE's intentionality and reciprocity, meaning, and transcendence principles can be most effectively applied to the advancement of

language acquisition in children with auditory impairments. By way of review of theoretical foundations as well as practical applications of MLE to this end, this research aims to contribute evidence toward an emerging body of research focused on inclusive and adaptive pedagogies for children with auditory impairments.

MLE has been used in intervention programs for hard of hearing children to address language delay, behavioral disorders, and psychosocial disabilities by providing enriched and responsive learning environments tailored to the individual child's development level and hearing loss. Because hearing loss can restrict access to spoken language and intellectual stimulation. MLE focus on intentional, mediated interaction serves as a compensatory strategy. The mediator's role is to adjust teaching strategies based on the child's needs, promoting not only scholastic growth but also social-emotional and critical thinking (Teklemariam, 2022). Empirical evidence supports the effectiveness of MLE in these settings. As an example, Teklemariam's (2022) Experimental study of 200 first-grade children from low socio-economic status revealed that teacher-led, MLE-facilitated interventions led to significant behavioral improvements in hearing-impaired and typically hearing children alike, suggesting that formal mediation can overcome most of the developmental deficits associated with hearing impairment.

Language development outcome is also influenced to a large degree by the quality and timing of early intervention. Studies by Yoshinaga-Itano *et al*. (2000) and Tomblin *et al.* (2016) bring to light that hearing loss detection and intervention by the age of 11 months is strongly associated with enhanced vocabulary and verbal reasoning capacity at the age of five. Such outcomes are optimally reinforced through conjunction with the frequent use of hearing aids, active parental involvement, and linguistic environments. Even with the early intervention, however, inequalities in the development of language are not entirely averted. Differences in individual characteristics in the degree and type of hearing loss still impact results, affirming the need for individually adapted intervention strategies that take account both of auditory and contextual factors.

While promising, several outstanding problems exist. Socioeconomic and environmental conditions, for instance, poor acoustic environments in classrooms, continue to impede language learning and academic success among hard of hearing children, especially in poor settings (Teklemariam, 2022). These conditions not only limit access to hearing but also continue to widen educational inequalities, particularly where support services and infrastructure are poor. The success of MLE intervention also depends partly on the teaching skills, indicating the need for expert teacher training and professional development. Teachers in general, particularly in less affluent regions, have no expertise to use MLE methods productively. Family involvement is also an important but often overlooked variable. Increased parental participation leads to increased academic success and generalization of skills beyond the classroom, suggesting that interventions in school need to be followed up with robust family-based components (Yoshinaga-Itano *et al*., 2000).

Aside from language and schoolwork, children who have hearing loss also have difficulties interacting socially and with their self-concept due to communication. MLE approaches try to close these psychosocial dimensions by establishing motivation, affective strength, and peer attachment (Teklemariam, 2022) so vital in language development. But to have lasting impact, interventions need to affect more pervasive system deficits, including socioeconomic disparities, teacher education, and environmental challenges. Challenges are most severe in low-resource settings like Ethiopia, where early hearing detection and intervention services are limited, and schools lack the capacity to handle children with hearing impairments.

Hearing impairment in children has been recognized internationally as a major communication, learning, and social interaction barrier. Early hearing screening and

intervention have been promoted on a widespread scale as best practice to minimize these effects (Yoshinaga-Itano *et al*., 2000). But in the majority of poor countries such as Ethiopia, these services are not yet provided everywhere. The prevalence of restricted newborn screening programs, noisy and overpopulated classrooms, poor socioeconomic status, and an untrained teaching staff significantly contribute to the progress of hard of hearing children. However, evidence from Ethiopian schools also indicates that interventions based on MLE can be successful even in these constrained environments (Teklemariam, 2022).

Despite global recognition of early intervention, hard of hearing children in Ethiopia remain under-served. Institutional barriers in the shape of resource limitation, outdated education data, and inadequate modified pedagogic approaches are some of the contributing factors perpetuating inequalities in development. While several studies have documented the overall benefits of MLE among children with hearing impairments (Teklemariam, 2022; Elemukan *et al*., 2024), the existing body of research lacks substantial evidence on the specific impact of MLE on language acquisition in normal, multilingual Ethiopian elementary schools. Most of the recent research either is on behavioral outcomes or in high-income settings, leaving plenty of contextual and methodological room to investigate language-specific effects in low-resource settings.

Apart from the time delay caused by the application of older data, most research fails to control the unique contribution of MLE for other factors such as hearing aid use or intervention type, leading to their limited application in evidence-based educational planning. Recent studies (Bekele and Tadesse, 2022; Asefa and Haji, 2023) reiterate the ongoing lack of support for hearing loss children, yet again accentuating the urgent need for context-specific research.

This study therefore aims to address these gaps by examining the effect of MLE on first-grade hard of hearing students' language development in Ethiopian primary schools. With focus on an under-represented group in a low-resource learning context, the study aims to provide up-to-date, targeted evidence for the design of inclusive education policy and practice that is locally responsive and globally contextualized.

Theoretical Framework

The Mediated Learning Experiences (MLE) theoretical model is grounded in the original research by Feuerstein (Teklemariam, 2022) and has been developed further by scholars such as Lidz and Jepsen (2021). Cognitive development, and language development as a process heavily enhanced through the active mediation of a caregiver or teacher, are emphasized in MLE. In this model, the mediator is an important bridge between learner and environment through consciously selecting stimuli, organizing learning activities, and managing the learning process to facilitate efficacious cognitive growth. This approach is especially vital for language-delayed at-risk children, since the mediator steps in to provide one-on-one assistance and tools of cognition instead of relying on the learner's receptive passivity to information (Feuerstein Institute, 2024).

Three fundamental principles form the core of MLE: intentionality and reciprocity, mediation of meaning, and transcendence. Intentionality refers to the systematic and goal directed regulation of the learning interaction by the mediator in a way that is intentional and directed to guiding the learner's attention to specific cognitive objectives (Vygotsky, 1978; Van der Veer and Valsiner, 2020). Reciprocity underpins intentionality through the active, open, and cooperative learner's response to the mediator's initiative, with a focus on meaningful learning being an ongoing two-way process (Pino-Pasternak and Sesen, 2021).

Mediation of meaning enhances the learning process by inviting learners to understand sense

of purpose and value of activities, encouraging emotional involvement and facilitating the transfer of knowledge, values, and cultural beliefs via joint discussion (Mercer & Littleton, 2021). Transcendence extends mediation past the here-and-now task by challenging students to transfer principles and strategies to new and dissimilar circumstances, thereby creating intellectual versatility, curiosity, and a desire for continuous learning (Vygotsky, 1978).

While these three principles form the backbone of the MLE framework, other aspects such as self-regulation, goal-setting, and competence support its flexible application according to learner needs (Lutz and Lutsy, 2021). MLE aligns closely with sociocultural theories of learning, highlighting cognition as a socially mediated process. It conceptualizes the teacher's role as an active facilitator who not only transmits knowledge but also scaffolds learners' cognitive and emotional development, enabling autonomy and self-regulation (Mentis and Mentis, 2008). In the context of language learning, especially for Amharic learners at risk of developmental delays, MLE provides a theoretically and practically sound framework for designing interventions that enhance learner engagement and cognitive modifiability through purposeful, meaningful, and reciprocal interactions (Feuerstein Institute, 2024). Thus, applying MLE principles as independent variables in language skill development underscores their practical significance, with effectiveness assessed through curriculum-based language tests that reflect learners' internalization and application of mediated learning. Based on this theoretical framework the present experimental research is to test two hypothesis.

Hypothesis

To guide the study, two quasi-experimental hypotheses were formulated. The first hypothesis speculated that the intervention of Mediated Learning Experience (MLE) through teacher competency would significantly impact the improvement of children's language ability. The second hypothesis was that such an effect of intervention would equally be effective in hearing and hard-of-hearing children, emphasizing its potential in promoting inclusive language development in heterogeneous learners.

Methodology

Study Design

Quasi-experimental design was employed in the present study. Quasi-experimental designs are especially useful in the arena of language development in children who are hard of hearing because they enable researchers to experiment with Mediated Learning Experiences without random assignment, which may be ethically or pragmatically challenging in this population. Quasi-experimental designs are matched on hearing loss severity, communication modality, and intervention timing, and allow for long-term evaluation of language development in natural instructional conditions. The design provides strong evidence of early and extended intervention impact on language development, vocabulary, and phonological knowledge (Tomblin et al., 2015). With the application of quasi-experimental methods, research can ensure ecological validity and yet continue to measure language development in hard-of-hearing children in a manner that is suitable.

Setting and Participants

The study was conducted in two government elementary schools in Addis Ababa's Gulele sub-city, consisting predominantly of low socio-economic, culturally homogeneous communities.

The experimental sample was one school with six first-grade classes and the control sample was another school with four first-grade classes.

480 first-grade children were screened for hearing status by qualified audiologists using calibrated pure tone audiometry. 100 children

from each school were selected from this population and matched between the groups by age, sex, language, parental socio-economic level, and hearing level, using typical matching procedures to minimize confounding variables. The hard of hearing, as well as hearing children, were selected to be able to explore differential intervention effects and adapt inclusive education practices (Alemayehu, 2018; Mojica and McIntyre, 2022).

All grade one teachers of the ten sections were trained in intervention, and home visits were conducted for a randomly selected subset of ten families to ground socio-economic and environmental factors affecting language development.

Intervention Procedures

The study used the pretest-posttest design over an eight-month school term. Both groups were administered baseline measurement (pretest) before the intervention was initiated. The experimental group received 84 hours of structured MLE-focused teacher training and in-class support, while the control group was given regular teaching without additional intervention.

A posttest was administered to both groups at the end of the intervention time to measure changes in language proficiency. This design enables within-group changes across time and between-group differences resulting from the intervention to be quantified (Creswell, 2014).

Equipment and Instruments

Hearing Assessment

Hearing screening was performed by two qualified audiologists utilizing calibrated Pure Tone Audiometers (PTA), frequencies ranging from 250 Hz to 8000 Hz, and sound intensities ranging from -10 to 120 dB, within controlled acoustic environments (Smith *et al.*, 2020). Testing took place in teachers' rooms, which had lower ambient background noise levels (around 54.5 dB) than classrooms. Background noise levels in test rooms, classrooms, and school environments were measured by a 93411 Digital Sound Level Meter (SLM), calibrated and certified by Ch. Beha GMbH, Germany to create standard testing environments that minimize auditory distractions and increase hearing assessment reliability.

Language Skills Assessment

The language skill of children was assessed using teacher-administered tests that aligned with Grade One Amharic language classes according to the Addis Ababa City Administration Bureau of Education (2020). Tests covered major aspects of language, vocabulary, syntax, pragmatics, and speech, and were administered privately to give an accurate measurement (Smith and Johnson, 2019; Brown, 2018).

Data Collection Procedures

Prior to data collection, ethical clearance was received from the sub-city education bureau and school principals. There was substantial training of teachers and research assistants in data collection procedures to achieve consistency and accuracy

The Sequence of Data Collection

The participants were first put through a hearing screening to ascertain auditory readiness for study. Both the experimental and control groups were subsequently administered a pretest to establish baseline measurements. The experimental group was then put through the Mediated Learning Experience (MLE) intervention, while the control group was not. Both groups were subsequently tested using a posttest eight months later to ascertain change or improvement. In aside from quantitative information, qualitative information was collected to add richness in the context. These included socioeconomic status information,, teacher ability, and school environment, collected using observation and informal

interviews. Such encounters were documented through video recording, audio recording, and field notes, in adherence to conventional qualitative research protocols (Creswell, 2014)

Data Analysis

Quantitative Analysis

Data were coded and processed using SPSS software (IBM Corp., 2021). Descriptive statistics (means, standard deviations) were employed to summarize language test scores.

Inferential statistics included: A two-way ANOVA was employed to establish the effect of hearing status and group status on language development. A repeated measures ANOVA was also employed to assess within-subject differences over time, as well as the interaction effects of intervention and hearing level (Tabachnick and Fidell, 2013). Alpha was set at 0.05, with results reported using 95% confidence intervals.

Qualitative Analysis

Qualitative data transcribed were thematically analyzed to identify socioeconomic factors, teachers' practice, and influences of acoustic environments on patterns of language development. Observations and interviews were coded, categorized, and triangulated with quantitative data for interpretive completeness (Patton, 2015; Creswell, 2014).

Ethical Considerations

The study adhered to ethical research practices and comprised: The research ensured ethics through several significant measures. Parents' and children's informed consent was taken prior to participation, so everyone understood the purpose and nature of the research. Participants were debriefed prior to data collection in order to provide transparency and manage expectations on procedures of the study. Data collection was securely and confidentially kept in order to protect participants' privacy. Further, to promote equitable access to the potential benefits of the intervention, the control group was offered a deferred Mediated Learning Experience (MLE) intervention following study termination.

Results

Teachers' Competence in the Profession

The teacher competence in inclusive education and MLE was quantified qualitatively pre- and post-intervention using the same MLE checklist. The teachers initially demonstrated several weaknesses: they failed to motivate learners to set learning goals, lacked intentional teaching actions, and did not demonstrate adequate care or engagement. They seldom involved students in activities, were generally unresponsive to student feedback, both written and verbal, and came to class unprepared. Furthermore, they gave little clarification when students were lost and made few efforts to foster motivation or enthusiasm. This resulted in passive learning environments, which were dominated by teacher talk. Overall, their conventional approach to teaching wasn't deliberately designed, interactive, and student-centered in nature, addressing learners' interests, needs, and potential. Student engagement was hardly supported. However, post-intervention observation showed a radical shift. Teachers moved away from the conventional approach and began adopting MLE principles of care, engagement, and inclusivity. Post-intervention developments are clarified further under the results.

This presentation of the result begins by addressing the two central hypotheses guiding our study. First, it was examined whether the Mediated Learning Experience (MLE) intervention, delivered through enhanced teacher competency, would significantly improve children's language abilities. Second, we explored whether this effect would be consistent across both hearing and hard-of-hearing children, highlighting the potential of MLE as an inclusive approach to support language development in diverse learning populations.

Nature of the Sampled Children

The study involved 200 grade one children, 100 in each experimental and control group. These were students from various sections within their respective schools. By the time of post-test eight months later, 10% of the experimental and 13% of the control group had dropped out, mainly due to migration from the sub-city for reasons not specified. This drop-out is a limitation of the study. Among the students who withdrew, 3% of the experimental group and 1% of the control group had been identified as hard of hearing.

Demographically, the two groups were identical in gender distribution (50% male, 50% female) and age distribution. The majority (92%) in the two groups also indicated Amharic as their mother tongue, with the remaining 8% indicating other mother tongues but being proficient in Amharic as a second language. In terms of hearing status, 54% of the children in the two groups were borderline hearing, 13.5% were hard of hearing, and 32.5% had normal hearing.

Parental Socioeconomic Status

A great majority of the 200 interviewed parents were educationally disadvantaged: 44.5% were illiterate, and 16% had not progressed beyond early primary school (grades 1–4). Another 25% had graduated from middle school (grades 5–8), and 17% had graduated from secondary school (grades 9–12). Only 5% of the fathers were college graduates, and none of the mothers had any college education. These findings show that parents' low educational levels are not sufficient to secure stable employment or to provide a home environment that is conducive to children's language growth. Mothers, in particular, suffer from educational and economic disadvantage, limiting their capacity to support their children's learning and overall development.

Employment data also brings to light the low socioeconomic status of the participating families. Nearly 69.5% of the parents were unemployed, and only 13% of them were working in government or NGO sectors. Those who were working were doing small-scale, short-duration work with little job security or income stability. As a result, a majority of the families were living a subsistence life. Teachers also confirmed that a majority of the students belonged to families below the poverty line.

The Acoustic Environment

The experimental school was situated in a highly noisy environment, with main roads and an active traditional clothes market in the vicinity. This created perpetual auditory distractions, which interfered with classroom communication between the teachers and students. The background noise level during the instructional period averaged 79.8 dB, while the noise level dropped to 67.5 dB in empty classrooms. In comparison, the control school had quieter background levels, 74.3 dB when in class and 63.1 dB when empty.

Ten teachers were interviewed and shared a similar concern about these conditions. All of those surveyed reported that poor acoustics significantly affected teaching and learning for students. Environmental noise was consistently described as a barrier to communication and instruction.

Effects of hearing on language skills

Table 1. Mean and SD on hearing language skills

Hearing status	Measurement	Experimental	Control	Total
Normal Hearing	N	28	37	65
	Mean (SD)	54.50 (16.94)	60.41 (18.51)	57.86 (17.95)
Borderline Hearing	N	57	51	108
	Mean (SD)	58.95 (14.05)	57.75 (19.29)	58.37 (16.66)
Hard of Hearing	N	15	12	27
	Mean (SD)	54.93 (12.41)	49.03 (19.34)	52.33 (15.81)
Total	N	100	100	200
	Mean (SD)	57.10 (14.79)	57.69 (19.12)	59.39 (17.02)

Two-way ANOVA test showed that hearing ability was not statistically significant in impacting performance on the Amharic language tests, $F(1, 194) = 0.018$, $p > .05$. This shows that participants' performance on the tests was the same irrespective of their varying levels of hearing. Lastly, the effect of group membership (control vs. experimental) was also not significant, $F(2, 194) = 1.497$, $p > .05$, indicating no differences in performance between groups overall. There was also no significant interaction between hearing level and group, $F(2, 194) = 1.407$, $p > .05$, indicating the effect of hearing didn't vary by group.

These findings mean that neither hearing status nor group membership had any meaningful impact on Amharic test performance. Also, the lack of an interaction effect implies that the relationship between hearing status and test performance was consistent across all groups. This has practical implications: both hearing-impaired and non-hearing-impaired participants performed equally regardless of whether or not they belonged to the experimental or control group.

Effects of the Intervention

This section compares the effects of the intervention on the language development of 177 children in the experimental and control groups. A repeated-measures ANOVA was used to evaluate the impact of MLE on language development. Pretest and posttest mean scores and standard deviations for both groups were analyzed (see the tables following each analysis).

Effects of Intervention on Language Skills

Table 2. Mean and SD on effects of intervention on language skills

Time	Measurement	Experimental group (n = 90)	Control group (n = 87)	Total n = 177
Pretest	Mean	57.23	56.94	57.09
Assessment	SD	14.58	18.45	16.55
Posttest	Mean	62.83	58.01	60.46
Assessment	SD	15.47	16.52	16.13

The within-subject main effect of time on language ability acquisition was statistically

Significant for the repeated-measures ANOVA, $F(1, 175) = 50.774$, $p < .05$, $\eta^2 = .225$, indicating that the effect size was medium. This suggests that overall, children's language abilities improved significantly from pretest to posttest. Also, there was significant time of measurement by group interaction, $F(1, 175) = 23.438$, $p < .05$, $\eta^2 = .118$, which indicates a small effect. This interaction indicates that the experimental group children had greater increases in language development compared to the control group. Nevertheless, the between-subjects effect was insignificant, $F(1, 175) = 1.129$, $p > .05$, $\eta^2 = .006$, suggesting that global group differences, over time, were minimal and of small magnitude.

Table 3. Mean and SD on the Effects of intervention and hearing level on language skills

Time	Hearing status	Experimental Group		Control Group		Total	
		N	Mean (SD)	N	Mean (SD)	N	Mean (SD)
Pre Intervention Assessment	Normal Hearing	25	54.24 (17.68)	34	60.71 (17.88)	59	57.97 (17.930)
	Borderline Hearing	53	59.26 (13.27)	42	55.26 (18.90)	95	57.49 (16.04)
	Hard of hearing	12	54.50 (12.57)	11	51.73 (17.860	23	53.17 (15.03)
	Total	90	57.23 (14.58)	87	56.94 (18.45)	177	57.09 (16.55)
Post Intervention Assessment	Normal Hearing	25	60.08 (16.93)	34	61.88 (15.15)	59	61.12 (15.81)
	Borderline Hearing	53	65.21 (15.08)	42	56.76 (17.30)	95	61.47 (16.56)
	Hard of hearing	12	58.08 (12.90)	11	50.82 (15.74)	23	54.61 (14.48)
	Total	90	62.83 (15.47)	87	58.01 (16.52)	177	60.46 (16.13)

The repeated-measures ANOVA revealed a statistically significant main effect of time on children's language development, $F(1, 171) = 26.27$, $p < .05$, $\eta^2 = .133$. This indicates that, overall, language skills improved across the study period for all participants, regardless of group or hearing level. However, the effect size was relatively small, suggesting that although the improvement was consistent and statistically meaningful, the magnitude of change was modest.

A significant interaction was found between time and group, $F(2, 171) = 16.55$, $p < .05$, $\eta^2 = .016$. This result suggests that the pattern of language improvement over time varied by group, with children in the experimental group showing greater gains than those in the control conditions. This interaction highlights the positive impact of the intervention, indicating that it effectively enhanced language development among the children who received it. On the other hand, there was no significant interaction between time and hearing level. $F(2, 171) = 1.38$, $p > .05$, $\eta^2 = .016$. This shows that hearing level was not an influencer on the rate or level of language learning over time.

Additionally, the three-way interaction between time, group, and hearing level was also non-significant, $F(2, 171) = 0.99$, $p > .05$, $\eta^2 = .000$. This indicates that the combined effect of group and hearing level failed to differentially influence on the children's language development during the study duration.

Finally, the between-subjects effects for group ($F(2, 171) = 0.70$, $p > .05$, $\eta^2 = .004$), hearing level ($F(2, 171) = 1.14$, $p > .05$, $\eta^2 = .013$), and their interaction ($F(2, 171) = 1.97$, $p > .05$, $\eta^2 = .023$) were all non-significant, with small effect sizes. This means that there were no substantial difference in overall language skill among groups or levels of hearing when time was not taken into account.

Overall, while language development improved more for all the children over time, the intervention was particularly effective for those who were in the experimental group. Hearing level, however, played no significant role in predicting language outcomes, or in moderating with the intervention effect. The results show that the intervention was effective irrespective of the hearing ability of the child and promotes its increased application in different populations.

Major Findings

This study answered to teacher incompetence by using a Multilingual Education (MLE) intervention for children's language improvement. The intervention strongly impacted Amharic language development, especially among the recipients. Two-way

ANOVA showed that hearing ability did not affect language development, while repeated-measures ANOVA also testified to overall improvement from pretest to posttest. Control and experimental groups varied, with children with hearing defects benefitting equally from the intervention.

Discussion

This section reports the findings of the study against the two key hypotheses:

1. That teachers' professional capacity, home and school environments, and hearing loss affect children's language acquisition; and

2. That intervention based on an MLE can significantly impact the language growth of both hearing and hard-of-hearing children.

The findings are reported in the context of Ethiopia's education policy and legal frameworks, as well as pertinent international conventions to which Ethiopia is a signatory.

Home and School Environments

The research found that kids of socioeconomically disadvantaged backgrounds tend to have restricted linguistic stimulation and emotional support in the home and experience additional disadvantage in schools that are under-resourced. Parental poverty, low parental literacy, and unemployment (Liu & Sun, 2023) are conditions that create a condition where the language development of children during their early childhood is impacted. This accords with Feuerstein's (200) theory of mediated learning, which emphasizes that children raised in poor environments require mediated and structured learning support.

These findings highlight the difficulties of carrying out Ethiopia's Education and TrainingPolicy (ETP, 1994), which provides for community involvement and fair access to good education. The Education Sector Development Program VI (ESDP VI, 2020–2025) also prioritizes reducing education differentials among disadvantaged groups, such as children from poor backgrounds and children with disabilities. In practice, however, systemic neglect persists in rural and poorly resourced areas.

Besides, Article 36 of the FDRE Constitution (1995) tantalizes that all children are entitled to learn and grow up in their own language and culture. However, when children are denied access to MLE or exposed to overcrowded, noisy classrooms (Kast, 2022), their language learning - particularly for children with hearing impairment is significantly disrupted. Such environmental limitations are contrary to the policy dream of inclusive and equitable education reflected in both ESDP VI and the Inclusive Education Strategy (2022).

The research, however, illustrates that even in disadvantaged settings, collaborative effort between parents, peers, and teachers under the MLE program can enable children's cognitive and language development (Kozulin *et al.,* 2020). This is consistent with Ethiopia's commitments under UNCRC (Article 29) and the African Charter on the Rights and Welfare of the Child that place emphasis on the importance of culturally and linguistically relevant teaching in promoting children's learning outcomes.

Teachers' Professional Competencies

Teachers demonstrated weaknesses in MLE pedagogy before the intervention, consistent with research by Benson (2022) and Kebede and Shiferaw (2023), which indicated systemic shortcomings in Ethiopian teacher preparation. Despite ETP (1994) making allowance for mother tongues to be used as languages of instruction and the Teacher Development Program (TDP III), a considerable majority of teachers have not been trained adequately in MLE methodologies.

After targeted professional development, teachers showed considerable improvement in their knowledge about and confidence in using MLE. This underscores the catalytic role of capacity-development interventions, as contemplated in ESDP VI and the Inclusive Education Strategy, both of which call for the

development of teacher competences in inclusive and multilingual pedagogies.

MLE basically changes the teacher's role from knowledge transmitter to mediator and facilitator of intellectual development. With teaching guided by Vygotsky's Zone of Proximal Development (ZPD), teachers were able to scaffold learning effectively, offering differentiated instruction that catered to the developmental requirements of specific learners (Kim and Hannafin, 2019). These practices are indicative of the learner-centered ideals advocated by Ethiopia's education reform agendas.

By being guided by both Feuersteinian and Vygotskian theories, the intervention was also strongly aligned to Ethiopia's inclusive education policy ambitions, confirming that effective professional development is crucial for improving educational equity and language outcomes.

Effects of Hearing Impairment

Consistent with international evidence (Wang and Paul, 2022), hearing impairment is linked with high risks for social exclusion and language delay due to decreased access to auditory input. Against expectation, no statistically significant language performance differences between hard-of-hearing and hearing children in the control group were identified through the research. This might be due to the shared experience of an overwhelmingly impoverished learning environment, which limited linguistic input for all students regardless of hearing status (Kern *et al*., 2023).

These results make it even more urgent to realize Ethiopia's Inclusive Education Strategy (2017), which recognizes children with disabilities, such as hearing impairment, as priority groups. Although the strategy supports inclusive practices and the provision of adapted educational materials, implementation remains patchy, particularly in rural schools.

Under Article 24 of the CRPD, Ethiopia is obligated to provide persons with disabilities with access to education on an equal basis with others. But the observed behavioral challenges, e.g., attention deficits and absence of peer interaction, among hard-of-hearing children (Alemayehu, 2019) are indicators of unsatisfied communication and emotional needs. Such observations show a gap between policy intention and classroom reality, and underscore the need for more comprehensive support services, such as speech therapy, assistive devices, and specialized teacher training.

Effects of Intervention on Language Development

The second hypothesis was also strongly supported: children who were given the MLE-based intervention developed significantly in language proficiency, both in listening, speaking, and phonological awareness. This demonstrates that well-designed, inclusive, and linguistically appropriate pedagogy can achieve measurable academic improvement, even for children with multiple levels of disadvantage.

Its success is also aligned with national education priorities established in ESDP VI, such as enhancing learning outcomes through mother language education, early grade reading programs, and inclusive education models. The intervention is also aligned with Ethiopia's commitments under SDG 4, particularly Target 4.5, which aims to eliminate inequities in education access for marginalized groups, such as children with disabilities.

Intervention teachers learned to identify each student's ZPD and implement differentiated approaches that facilitated students' progression from concrete to abstract thought (Vygotsky, 1962; Pérez and García, 2021). These practices reflect the inclusive, child-centered principles upheld by both the ETP and the Inclusive Education Strategy.

The application of dynamic assessment methods (Grigorenko, 2020) also permitted the educators to focus on the potential of every learner, rather than a fixed level of aptitude. This formative approach is consistent with Ethiopia's curriculum reform ambitions, which

require competency-based and ongoing assessment mechanisms.

By encouraging transcendence, the ability of the learner to apply acquired skills to new situations, the intervention bridged existing learning gaps (Hadidi and Mowlaie, 2023). The findings corroborate arguments by Alper (2022) that systematic mediation is essential in the formation of higher mental functions in disadvantaged learners.

Conclusion

The results corroborate arguments by Alper (2022) that systematic mediation is crucial in the development of higher mental functions among underprivileged learners.

The study recognizes the critical necessity for more policy coherence and practice realization in Ethiopia's education sector. Despite having a proper legal and policy framework, the Education and Training Policy (ETP, 1994), the Education Sector Development Program VI (ESDP VI), and the Inclusive Education Strategy (2022), these

policies are rarely put into practice, particularly in marginalized and rural areas. The result is an education system in which the majority of vulnerable children, including children with disabilities, are not provided with the support they require to thrive. The findings of this study demonstrate that the language development of hearing and hard-of-hearing children can be significantly improved when they are provided with well-trained teachers, mother tongue instruction, and conducive learning settings. In circumstances where poverty, poor infrastructure, and untrained teaching staff tend to discourage learning, this research demonstrates that such constraints could be circumvented through overt Mediated Learning Experiences (MLE). Through these kinds of interventions, if provided by well-trained teachers, situations for meaningful learning and cognitive progress emerge.

Above all, the study concludes that hearing status itself is not a predictor of language success. Instead, what is crucial is the quality of meditational instruction, how educators facilitate learning, adapt instruction to students' needs, and engage students in culturally relevant conversation. The quasi-experimental evidence reported here shows the revolutionary power of MLE, particularly when implemented by reflective, well-trained teachers. These findings are aligned with Ethiopia's national education objectives and in line with its global commitment under the UN Convention on the Rights of the Child (UNCRC), the Convention on the Rights of Persons with Disabilities (CRPD), and Sustainable Development Goal 4 (SDG 4) to achieve inclusive, equitable, and quality education.

Supporting MLE to its maximum requires system-level commitment to teacher preparation, inclusive classroom practices, and early intervening systems. It entails getting teachers equipped with the tools, strategies, and staff development to serve diverse learners and developing school climates that are physically and emotionally supportive. These steps are not only essential for improving language achievement but also for creating greater educational equity and inclusion.

For the future, further research is needed to examine the long-term impact of MLE on children's language, educational, and psychosocial development. Future studies should examine the impact of parental involvement and home–school collaboration, particularly in poor resource environments, and establish how MLE can be adapted to children with varying hearing impairments, from mild to severe. Some of the other areas of inquiry include the effect of classroom acoustics on learning, the development of scalable models for the training of teachers that integrate MLE and inclusive pedagogies, and how technology-enabled MLE might be leveraged to reach remote or disadvantaged communities.

Finally, this study provides rigorous evidence that culturally responsive MLE taught by teachers is a powerful intervention for continued language expansion among linguistically and culturally diverse student populations. Under the umbrella of supportive policies, ongoing professional development of

teachers, and fruitful community engagement, MLE can serve as an early sign for Ethiopian education reform. Systematic policy attention and research are imperative to ongoing and large-scale replication of these promising outcomes.

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