

THE ROLE OF DIFFERENTIATED EVIDENCE-BASED LEARNING APPROACHES IN IMPROVING ACADEMIC PERFORMANCE OF LEARNERS WITH HEARING IMPAIRMENT

Authors: Joan Jeremiah¹, Lazarus Millan Okello², Eliud Oyoo³

¹Rongo University, Department of Educational Psychology and Science
P.O. Box 103-40404 RONGO.

Co. Author Email: joanjeremiah5@gmail.com

Abstract: *Special education aims to ensure that learners with disabilities receive appropriate instruction that addresses their unique educational needs. Despite policies promoting inclusive and specialized education, learners with hearing impairment continue to record lower academic achievement than their peers with normal hearing. The study sought to examine the role of differentiated evidence-based learning approaches in the academic achievement of learners with hearing impairment in special primary schools in Kisii County, Kenya. A cross-sectional survey design was employed by the study, involving a sample of 112 purposively selected Grade 4 and Grade 5 learners with hearing impairment from a population of 482 learners, as well as teachers, headteachers, and curriculum support officers. Quantitative data were collected using questionnaires, while qualitative data were obtained through interview schedules and observation checklists. Instrument reliability was established using the test-retest method ($r = .76$). Quantitative data were analysed using descriptive statistics and analysis of variance, while qualitative data were analysed thematically. The findings indicated that differentiated evidence-based learning approaches significantly contributed to learners' academic achievement ($F(18,17) = 4.952, p = .001$). Similarly, differentiated evidence-based assessment approaches significantly enhanced academic achievement ($F(10,25) = 2.586, p = .026$). Teachers' positive attitudes towards implementing differentiated learning and assessment approaches were also associated with improved academic achievement. The study concluded that differentiated evidence-based instructional and assessment practices play an important role in improving the academic achievement of learners with hearing impairment. It recommends strengthening teacher capacity through continuous professional development and institutional support to enhance the effective implementation of differentiated evidence-based practices in special primary schools.*

Keywords: *Differentiated Evidence, Exemplary Academic Performance, Hearing Impaired Learners, Learning Approaches*

INTRODUCTION

Universal access to primary and secondary education is a global priority that includes learners with special needs. Learners with special needs are individuals who experience educational difficulties arising from cognitive, physical, or sensory impairments and therefore require additional instructional support (Laamanen et al., 2021). Special education systems are mandated to provide appropriate and specialized instruction that responds to these diverse needs. Despite inclusive education policies and frameworks, learners with hearing impairment (HI)

continue to demonstrate significantly lower academic achievement than their hearing peers, a challenge evident globally and within the Kenyan education system.

Globally, more than one billion people live with some form of disability, representing approximately 15% of the world's population, with about 190 million experiencing significant functional difficulties (World Health Organization [WHO], 2021). Among children aged 6 to 19 years, approximately 15% have some degree of hearing impairment, while about 1% experience severe hearing loss (Joy, 2022). Hearing impairment in childhood has substantial implications for language development, communication, social interaction, and academic performance. Reduced auditory input often results in delayed language acquisition, limited vocabulary development, and persistent challenges in literacy skills such as reading, spelling, and writing (WHO, 2020).

Empirical evidence consistently indicates that learners with hearing impairment are at increased risk of academic underachievement, with instructional and methodological factors contributing significantly to these outcomes. Pozas and Schneider (2019) report that up to 50% of academic underachievement among learners with HI may be attributed to instructional approaches that inadequately address their linguistic and cognitive needs. These findings underscore the need for instructional strategies that deliberately support language development, comprehension, and active learner engagement.

Differentiated evidence-based learning approaches (DEBLA) have gained recognition as effective strategies for addressing learner diversity. Differentiation involves adapting instructional content, processes, and learning environments to accommodate individual differences, thereby enhancing engagement, retention, and academic performance. Research shows that differentiated instruction promotes learner participation, persistence, task completion, and improved assessment outcomes. However, despite growing global interest, limited empirical research has examined the effectiveness of differentiated instruction among learners with hearing impairment, particularly in Kenyan primary school contexts.

Cooperative learning is a widely recognized evidence-based instructional approach that emphasizes structured group interaction to enhance learning outcomes. Johnson and Johnson (2018) argue that cooperative learning increases intellectual and emotional engagement by shifting the teacher's role from information delivery to facilitation of active learning experiences. Studies conducted in Europe and other regions demonstrate that cooperative learning improves reading comprehension and content understanding among learners with hearing impairment (Altan, 2021; Berzener et al., 2021). Similarly, studies from the United States and the United Arab Emirates report that cooperative learning enhances learner motivation, social interaction, and differentiated instruction in language learning contexts (Barber & Klauda, 2020; Ismail & Allaq, 2019). Nevertheless, evidence on its effectiveness among Kenyan primary school learners with HI remains limited.

Captioned and sign-supported videos have shown potential in improving comprehension, literacy, and knowledge retention among learners with hearing impairment. Studies from the United States and Malaysia indicate that captioned videos enhance reading performance, content understanding, and retention of learned material (Whitney & Dallas, 2019; Hashim & Tasir, 2020). Davis (2024) similarly reports improved learner performance on assessment items related to video-presented content. However, localized evidence on the contribution of captioned videos to academic achievement among Kenyan learners with HI remains insufficient.

Extensive reading opportunities have also been identified as critical in improving comprehension, self-efficacy, and intrinsic motivation. Increased exposure to reading materials fosters deeper comprehension, sustained attention, and positive beliefs about one's reading ability (Barber & Klauda, 2020; Alenizi, 2019). Learners further acknowledge that frequent reading enhances vocabulary development, independence, and motivation (Melani & Syafitri, 2019). Despite these benefits, the role of structured reading opportunities in supporting learners with hearing impairment within Kenyan primary schools has not been adequately examined.

Guided by sociocultural and constructivist perspectives, this study assumes that learning occurs through active engagement and social interaction, with achievement influenced by the level of instructional support provided. Hearing impairment often results in delayed receptive and expressive language development, leading to varied academic outcomes and necessitating instructional approaches responsive to individual learner needs. Consequently, this study sought to examine the role of differentiated evidence-based learning approaches in the academic achievement of learners with hearing impairment in special primary schools in Kisii County, Kenya.

METHODOLOGY

This study employed a cross-sectional survey design, appropriate for examining prevailing practices, perceptions, and relationships among variables within a defined population at a single point in time (Creswell & Guetterman, 2021). The design enabled systematic analysis of the relationship between differentiated evidence-based learning approaches and the academic achievement of learners with hearing impairment, while capturing naturally occurring variations in instructional practice across schools.

A mixed-methods approach was adopted, integrating quantitative and qualitative strands to enhance methodological rigor through triangulation and complementarity. The combination of numerical and narrative data strengthened the validity of findings by allowing convergence and corroboration across instruments (Ongukah et al., 2023). Quantitative data provided measurable patterns of instructional practices and learner outcomes, while qualitative data offered contextual explanations of observed trends.

The target population comprised 400 pupils with hearing impairment (250 girls and 150 boys), 67 teachers, 6 headteachers, and 6 curriculum support officers drawn from special primary schools and special units for learners with hearing impairment in Kisii County. Pupils were included to assess classroom participation, engagement, and learning outcomes under differentiated instructional approaches. Teachers were selected because they are directly responsible for instructional delivery and implementation of differentiated evidence-based

strategies. Headteachers were included due to their supervisory and instructional leadership roles, while curriculum support officers were targeted for their mandate in curriculum oversight and quality assurance at the sub-county level.

Category of Respondents	Target population	Sample population	Sampling Criteria
Pupils	400	112	Purposive sampling
Teachers	67	36	Purposive sampling
Head teachers	6	6	Census sampling
CSOs	6	6	Purposive sampling
Totals	479	160	

Source: MOE Kisii County (2023)

Purposive sampling was used to select five special primary schools and one special unit, based on school category and relevance to the study objectives (Creswell & Guetterman, 2021). From these institutions, 112 Grade 4 and Grade 5 learners were sampled. Learners at this level are expected to have attained foundational literacy, numeracy, and cognitive skills necessary to demonstrate content mastery and independent engagement with learning tasks (Rutzler, 2022). Their selection therefore enabled meaningful assessment of academic achievement in relation to differentiated instructional approaches. Additionally, 36 Grade 4 and Grade 5 teachers were purposively selected because they directly taught the sampled learners and were actively engaged in classroom implementation. All 6 curriculum support officers were included due to their small number and strategic oversight role. A census approach was applied to include all 6 headteachers, given their limited population and supervisory significance (Kothari, 2022).

Data were collected using structured questionnaires, observation checklists, and in-depth interviews. Questionnaires captured teachers' perceptions, attitudes, and self-reported practices regarding differentiated evidence-based learning approaches (Amaresan, 2022). Observation checklists enabled direct assessment of classroom implementation, focusing on learner participation, quiz performance, homework completion, instructional adaptation, and engagement during lessons (Creswell & Guetterman, 2021). In-depth interviews with

headteachers and curriculum support officers provided contextual insights into instructional supervision, resource allocation, policy implementation, and institutional support mechanisms influencing differentiated practices (Bhatt, 2023).

Quantitative data were analysed using descriptive statistics, including frequencies, means, and standard deviations, to summarize patterns and trends in instructional practices and learner outcomes. Inferential analysis was conducted using Analysis of Variance (ANOVA) to determine statistically significant differences and relationships between differentiated instructional approaches and academic achievement among learners with hearing impairment (Bhandari, 2022). The inferential procedures enabled generalization from the sample to the broader population within the study context.

Qualitative data from interviews were transcribed, coded, and subjected to thematic analysis. Codes were examined for convergence, overlap, and redundancy, then organized into broader categories and themes. These themes were presented narratively to complement and contextualize quantitative findings, thereby enhancing interpretive depth and coherence (Creswell & Guetterman, 2021).

Ethical principles of informed consent, confidentiality, voluntary participation, and data protection were strictly observed. Approval was obtained from relevant education authorities and school administrations prior to data collection. Participants were informed of the study's purpose and their right to withdraw without penalty, and informed consent was secured from all adult respondents. Assent and guardian consent were obtained for learners with hearing impairment. Anonymity was ensured, and data were securely stored for academic purposes only.

RESULTS AND DISCUSSION

Demographic characteristics of respondents

Table 1: Highest Academic Qualifications of Respondents

Respondents		Highest Academic Qualification					Total
		P1	Diploma	Bachelors	Masters	PhD	
Teachers	Frequency	1	22	10	3	0	36
	%	2.8	61.1	27.8	8.3	0.0	100.0

Table 1 shows that 61.1 percent of the respondents (majority) had diploma as highest academic qualification, 27.8 percent of the respondents have bachelor's degree as their highest academic qualification. The findings show that the teachers were competently trained to teach in the schools where they were deployed in. The data on academic qualification was important because it not only showed representability of the respondents, but also their ability to handle learners with HI as justified by Maithya, Milimu and Nixon (2024).

The findings of the study were presented in tables and discussions as follows.

Table 2: Differentiated Evidenced-Based Learning Approaches for Learners with HI

Aspect	R	Ratings of Contribution to Academic Achievement					M	SD
		NC	LC	MC	HC	VHC		
		1	2	3	4	5		
Differentiated pace of content delivery to learners	F	1	3	12	18	2	3.47	.845
	%	2.8	8.3	33.3	50.0	5.6		
Differentiated teaching tasks	F	0	1	7	22	6	3.92	.692
	%	0.0	2.8	19.4	61.1	16.7		
Cooperative group learning builds positive attitude of independence towards learning in learners	F	0	1	8	16	11	4.03	.810
	%	0.0	2.8	22.2	44.4	30.6		
Cooperative group learning improves knowledge retention in learners	F	0	1	9	13	13	4.06	.860
	%	0.0	2.8	25.0	36.1	36.1		
Cooperative group learning builds team spirit in learners	F	0	0	8	14	14	4.17	.775
	%	0.0	0.0	22.2	38.9	38.9		
Cooperative group learning improves comprehension of content in learners	F	0	2	6	15	13	4.08	.874
	%	0.0	5.6	16.7	41.7	36.1		
Cooperative group learning increases knowledge acquisition in learners	F	0	4	6	13	13	3.97	1.00
	%	0.0	11.1	16.7	36.1	36.1		
Cooperative group learning builds more on task behaviour in learners	F	0	0	9	15	12	4.08	.770
	%	0.0	0.0	25.0	41.7	33.3		
Captioned videos increase information retention in learners	F	1	1	1	14	19	4.36	.899
	%	2.8	2.8	2.8	38.9	52.8		
Captioned videos improve comprehension and literacy in learners	F	1	1	4	13	17	4.22	.959
	%	2.8	2.8	11.1	36.1	47.2		
Captioned videos improve learner participation in lessons	F	0	0	5	9	22	4.47	.736
	%	0.0	0.0	13.9	25.0	61.1		
Captioned videos improve learner concentration in lessons	F	0	0	3	10	23	4.56	.652
	%	0.0	0.0	8.3	27.8	63.9		
Captioned videos improve memory and comprehension in learners	F	0	1	2	12	21	4.47	.736
	%	0.0	2.8	5.6	33.3	58.3		
Abundant reading opportunities develop learners' persistence in learning	F	0	6	8	6	16	3.89	1.17
	%	0.0	16.7	22.2	16.7	44.4		
Abundant reading opportunities manage impulsivity in learners	F	0	3	14	3	16	3.89	1.09
	%	0.0	8.3	38.9	8.3	44.4		
Abundant reading opportunities develop the skill of attention in learners	F	0	4	8	7	17	4.03	1.08
	%	0.0	11.1	22.2	19.4	47.2		
Abundant reading opportunities develop in learners' positive attitude towards lessons	F	0	1	14	5	16	4.00	.986
	%	0.0	2.8	38.9	13.9	44.4		
	F	0	1	13	6	16	4.03	.971

Abundant reading opportunities %	0.0	2.8	36.1	16.7	44.4
develops intrinsic motivation in learners					

Table 3: Inferential statistics results on Differentiated Evidence Based Learning

Aspect	F-statistic	p-value
Differentiated pace of content delivery	F (3, 32) = 5.93	p = .002
Differentiated teaching tasks	F (3, 32) = 1.53	p = .227
Cooperative learning – independence	F (3, 32) = 5.42	p = .004
Cooperative learning – retention	F (3, 32) = 12.55	p = .000
Cooperative learning – team spirit	F (3, 32) = 6.27	p = .002
Cooperative learning – comprehension	F (3, 32) = 4.98	p = .006
Cooperative learning – knowledge retention	F (3, 32) = 8.96	p = .000
Cooperative learning – on-task behavior	F (3, 32) = 12.25	p = .000
Captioned videos – literacy	F (3, 32) = 11.50	p = .000
Captioned videos – participation	F (3, 32) = 9.47	p = .000
Captioned videos – concentration	F (3, 32) = 5.49	p = .004
Captioned videos – memory & comprehension	F (3, 32) = 12.13	p = .000
Reading opportunities – persistence	F (3, 32) = 19.07	p = .000
Reading opportunities – impulsivity	F (3, 32) = 13.11	p = .000
Reading opportunities – attention	F (3, 32) = 15.17	p = .000
Reading opportunities – positive attitude	F (3, 32) = 34.74	p = .000
Reading opportunities – intrinsic motivation	F (3, 32) = 19.70	p = .000
Overall	F (18, 17) = 4.95	p = .001

Table 2 indicates that differentiated pace of content delivery substantially contributes to the academic achievement of learners with hearing impairment (HI). Half of the respondents (50.0%) rated its contribution as high, while 33.3% rated it as moderate, supported by a mean score of 3.47 (SD = 0.845). These findings align with Zook (2018), who reports that pacing instruction enhances engagement among learners with HI by allowing participation despite existing learning gaps. Differentiating instructional pace enables learners to actively engage in lessons and supports equitable participation.

Qualitative findings reinforced this result. One headteacher (HT05) emphasized that variation in levels of hearing impairment necessitates instructional pacing tailored to individual learning gaps, enabling learners to progress without undue pressure:

Teachers need to attend to learners with HI differently based on their learning needs, this is because their levels of Hearing Impairment vary and affect their learning differently. So, with this in mind, the teacher will be able to determine the speed used in learning based on known learning gaps. [HT05]

These highlights differentiated pacing as a critical strategy for inclusive instruction and improved academic outcomes.

Further results show that differentiated teaching tasks were rated as having a high contribution by 61.1% of respondents, with a mean score of 3.92. This finding corroborates Puzio et al. (2020), who report that task differentiation enhances academic achievement. Differentiated tasks enable teachers to address individual learning needs and bridge hidden academic gaps among learners with HI, thereby promoting mastery of content. Qualitative evidence supported this conclusion, with respondents noting that evidence-based differentiated tasks allow teachers to address both hearing-related and cognitive challenges effectively:

Each child is different and unique in a class with learners with hearing impairment. This is because the disability is not specific to their hearing only, there are other underlying challenges like cognitive challenges and this makes it necessary to identify their needs through their learning gaps. So, to build learner capacity and enable teachers to reach them, evidence-based differentiated tasks during content delivery is the best approach to teach them. [CSO 4]

These findings stress the need for teachers of learners with HI to differentiate teaching and learning tasks as it is the only means through which these learners' most hidden learning gaps can be identified and bridged. Differentiating tasks ensures that each learner is handled at their cognitive level hence academic achievement.

Table 2 indicates consistently high to very high contributions across multiple constructs. Cooperative group learning was rated as contributing to learner independence ($M = 4.03$), team spirit ($M = 4.17$), knowledge retention ($M = 3.97$), comprehension ($M = 4.08$), and on-task behaviour ($M = 4.08$). These findings are consistent with prior studies (Ismail & Allaq, 2019; Akay, 2020; Altan, 2021), which report that cooperative learning promotes engagement, reasoning, and independence.

Qualitative findings further revealed that CL creates a learner-centred environment where learners feel confident interacting with peers, facilitating shared understanding and sustained engagement. Headteachers noted that peer interaction reduces anxiety, encourages persistence in tasks, and supports independent learning behaviours, all of which contribute to improved academic achievement:

Children learn better from their peers as they do not fear expressing themselves. This gives them confidence as they feel that no one is looking down on them as they are age mates. This builds in them a spirit to work as a team, further developing in their independence to work on their own. [CSO 2]

This was further supported by sentiments of HT 05 that, "Through CL, learners will develop independence in learning as it allows them to manipulate learning as they are on their own."

Findings also show that captioned videos (CV) had very high contributions across several learning outcomes. A majority of respondents rated captioned videos as contributing highly or very highly to information retention ($M = 4.36$), comprehension and literacy ($M = 4.22$), learner participation ($M = 4.36$), concentration ($M = 4.56$), and memory and comprehension ($M = 4.47$). These results support earlier studies (Whitney & Dallas, 2019; Montero, 2020; Gesa, 2023), which document the effectiveness of captioned videos in enhancing comprehension, vocabulary acquisition, and long-term retention among learners with HI.

Qualitative data further indicated that captioned videos align with the visual learning strengths of learners with HI and compensate for limited access to sign-supported textbooks. Respondents noted that captioned videos promote sustained attention, facilitate memory formation, and improve expressive abilities.

Abundant reading opportunities were found to moderately to highly contributing to persistence ($M = 3.89$), attention ($M = 4.03$), positive attitude toward learning ($M = 4.00$), intrinsic motivation ($M = 4.03$), and management of impulsivity. These findings are consistent with Barber and Klauda (2020) and Khalid (2022), who emphasize the role of extensive reading in developing self-efficacy, motivation, and sustained attention. The findings suggest that structured reading opportunities enhance vocabulary development, reduce frustration, and foster positive learning dispositions among learners with HI.

Descriptive statistics from Table 2 show that, the overall contribution of differentiated evidence-based learning approaches on academic achievement of learners with HI in special schools is high (mean = 4.17; standard deviation = .910). This implies that as the evidence-based learning approaches change towards learner centred so does academic achievement of learners with HI. However, the mean rating from Table 2 indicates a low implementation rate ($M < 3.00$) except for a few practices. If only teachers of learners with HI would implement the differentiated learning approaches, there would be high contribution to the academic achievement of learners with HI. However, there is a huge gap at the implementation level even though they know what should be done. It is this area that still requires action if marked academic achievement is to be realized in learners with HI.

As shown in Table 3, the one-way ANOVA tests at ($\alpha = .05$), shows that there is enough statistical evidence that the difference in means of the respondents on differentiated learning approaches ($F = 18.17$; $p = 4.952$, $p = .001$) significantly contributes to academic achievement of learners with HI but at different rates. Further, the F statistics of 4.952 being small implies that there are large differences among group means relative to the variability within each group, hence contributing to the academic achievement of learners differently but significantly ($p = .001$).

Observed Implementation of Differentiated Evidenced Learning Approaches

The study examined the discrepancy between respondents' reported knowledge of recommended practices and the actual instructional practices observed in classrooms. Classroom observations were conducted to assess both teacher and learner behaviours in the implementation of differentiated teaching approaches within authentic instructional settings. Data collection was guided by specific indicators, which were subsequently analysed and summarized in Table 2.

Table 4
Analysis of Observation Checklist Results on Differentiated Evidenced-Based Learning Approaches

Indicators of Differentiated Evidenced-Based Learning Approaches and Academic Achievements from Observation Checklist	R	Ratings of Contribution to Academic Achievement					M	SD
		N	R	M	HT	A		
		1	2	3	4	5		
Teacher differentiates content delivery through more time allocation for lessons	F	0	2	10	1	0	2.92	.494
	%	0.0	15.4	76.9	7.7			
Teachers constantly adapt instructional language to help learners understand learning expectations	F	0	0	0	0	13	5.00	.000
	%	0.0	0.0	0.0	0.0	100		
The teacher differentiates learning tasks into small chunks into small groups	F	7	3	2	0	1	1.85	1.21
	%	53.8	23.1	15.4	0.0	7.7		
The teacher supervises learners as they work in small groups	F	7	4	1	0	1	1.77	1.17
	%	53.8	30.8	7.7	0.0	7.7		
Learners independently carry out assigned tasks in groups	F	7	4	1	0	1	1.77	1.17
	%	53.8	30.8	7.7	0.0	7.7		
Learners are eager to answer questions posed through repeated hand-lifting	F	2	4	6	0	1	2.54	1.05
	%	15.4	30.8	46.2	0.0	7.7		
Learners exude confidence by looking at the teacher while responding to questions raised in small groups	F	5	5	2	0	1	2.00	1.16
	%	38.5	38.5	15.4	0.0	7.7		
Learners exude confidence by speaking loudly while responding to questions	F	3	4	5	0	1	2.38	1.21
	%	23.1	30.8	38.5	0.0	7.7		
Learners work as a team while carrying out assigned tasks	F	5	5	0	1	2	2.23	1.48
	%	38.5	38.5	0.0	7.7	15.4		
Learners are motivated to learn through completion of assigned tasks	F	4	4	3	0	2	2.38	1.39
	%	30.8	30.8	23.1	0.0	15.4		
Teachers use captioned videos to aid in content delivery	F	12	0	1	0	0	1.15	.555
	%	92.3	0.0	7.7	0.0	0.0		
The teacher guides learners to identify new words from captions	F	12	0	1	0	0	1.15	.555
	%	92.3	0.0	7.7	0.0	0.0		
The teacher focuses on literacy development by helping learners look up the meaning of new words and asking questions	F	11	1	1	0	0	1.23	.599
	%	84.6	7.7	7.7	0.0	0.0		
Learners persist in learning through maintained attention as others read	F	8	3	2	0	0	1.54	.776
	%	61.5	23.1	15.4	0.0	0.0		

Learners are engaged in lessons through abundant reading opportunities	F	8	4	1	0	0	1.46	.660
	%	61.5	30.8	7.7	0.0	0.0		
Teacher continuously builds learner confidence through positive reinforcements	F	2	0	7	2	2	3.15	1.21
	%	15.4	0.0	53.8	15.4	15.4		
Learners attentively listen and observe as others read	F	2	9	2	0	0	2.00	.577
	%	15.4	69.2	15.4	0.0	0.0		
Teachers questions after reading target development of memory skills	F	1	3	6	0	3	3.08	1.26
	%	7.7	23.1	46.2	0.0	23.1		
Teachers ask direct questions during reading to minimize impulsivity in learners	F	1	6	4	1	1	2.62	1.04
	%	7.7	46.2	30.8	7.7	7.7		
Learners eager to learn through maintained classroom participation	F	1	4	6	1	1	2.77	1.01
	%	7.7	30.8	46.2	7.7	7.7		

Results show that most teachers (76.0%) moderately differentiated time allocation for learners ($M = 2.92$, $SD = 0.845$), indicating that while the practice contributes to academic achievement of learners with hearing impairment (HI), it is not uniformly applied. Observation also revealed limited task differentiation, with 53.8% of teachers never dividing learning tasks into small groups and only 23.1% doing so occasionally, yielding a low overall mean rating of 1.85 ($SD = 1.21$). This was corroborated by a Curriculum Support Officer.

Most Teachers in special schools for learners with hearing impairment have continually ignored learner differences despite knowing what is expected of them during instruction delivery. Most of them are stuck to a teaching method where the teacher is the center of attention in class failing to source for the right teaching resources, they download content online and just give notes. [(CSO1]

All teachers (100%) were observed consistently adapting instructional language to facilitate learner comprehension, reflected in the maximum mean rating of 5. However, supervision of learners in small groups was minimal: only 7.7% of teachers actively monitored group work, 30.8% did so rarely, and 53.8% never, resulting in a mean rating of 1.77. Headteacher 2 remarked, "There is very little commitment from most teachers who have an attitude of 'Teach, finish and go home.'" These teachers lack the desire to focus on learners' differences as they see it as time-consuming. They have therefore become barriers to learning as they create apathy in learning."

Implementation of captioned videos (CVs) was notably low, with 92.3% of teachers not using them in lessons ($M = 1.15$, $SD = 0.555$). Similarly, guidance for learners to identify new words from captions was rarely observed ($M = 1.55$, $SD = 0.55$). A head teacher stated:

Captioned videos are not being used totally in most of our schools, as we lack the necessary resources to make these videos. We are, however, making use of charts, though not every teacher makes them due to lack of proper preparation [HT 1]

Efforts to develop literacy through targeted questioning and vocabulary instruction were also minimal ($M = 1.23$), consistent with another remark:

As a school, we may be short of implementing the evidence-based differentiated learning approaches because the syllabus is too wide, the time allocated to attend to the learner is fixed and with the low staffing and few resources, we have not been able to make use of these approaches though we understand and know its benefits to our learners. [HT 5]

In contrast, positive reinforcement practices were more consistently observed. Teachers frequently built learners' confidence through encouragement ($M = 3.15$, $SD = 1.21$), and questioning after reading to develop memory skills was moderately implemented ($M = 3.08$, $SD = 1.26$).

Reading is vital in teaching learners with hearing impairment as through it, they can develop the important skills of both expressive and receptive communication. With time they develop an independence which allows them to manipulate learning and as they do develop understanding and memorization of important concepts. [HT 3]

Observation of learner behaviours reflected the effects of low implementation of differentiated approaches. Indicators such as independent task completion in groups ($M = 1.77$), eagerness to answer questions ($M = 2.54$), confidence when responding ($M = 2.00$ – 2.38), teamwork ($M = 2.23$), motivation through task completion ($M = 2.38$), sustained attention ($M = 1.54$), engagement via abundant reading ($M = 1.46$), attentive observation ($M = 2.00$), and maintained participation ($M = 2.77$) all indicated suboptimal learner outcomes under current instructional practices.

CONCLUSION

Differentiated evidence-based learning approaches demonstrate statistically significant effects on the academic achievement of learners with hearing impairment; however, low levels of implementation limit their potential impact on learning outcomes. One-way ANOVA results indicate that, at $\alpha = .05$, there is sufficient statistical evidence that differences in respondents' use of differentiated learning approaches significantly influence the academic achievement of learners with hearing impairment ($F(18, 17) = 4.952$, $p = .001$), albeit at varying levels. The obtained F value (4.952) indicates substantial differences among group means relative to within-group variability, confirming that differentiated approaches contribute differently but significantly to learners' academic achievement ($p = .001$).

To enhance effective implementation, teachers of learners with hearing impairment should receive targeted professional development in differentiated evidence-based learning approaches. Such training would strengthen teachers' skills and confidence in addressing diverse learning needs and foster learner independence, which is likely to improve academic achievement among learners with hearing impairment. In addition, the Ministry of Education should strengthen policy frameworks for the education of learners with hearing impairment through systematic monitoring of instructional practices, clearly defined accountability standards, continuous feedback mechanisms, and sustained teacher mentoring.

Data Availability Statement

The datasets generated and analysed during the study are not publicly available due to confidentiality agreements with participants and institutions but are available from the corresponding author on reasonable request for academic or research purposes.

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CRedit Authorship Contribution Statement

Joan Jeremiah (Postgraduate Student, Department of Educational Psychology and science, Rongo University): Conceptualization, Methodology, Data Curation, Investigation, Formal Analysis, Writing – Original Draft.

Lazarus Millan Okello (Lecturer, Rongo University): Supervision, Validation, Project Administration, Methodological Guidance, Writing – Review & Editing.

Eliud Oyoo Oure (Lecturer, Rongo University): Supervision, Methodological Guidance, Writing – Review & Editing

Declaration of Generative Ai And Ai-Assisted Technologies

During the preparation of this manuscript, the authors used AI technologies to support language clarity and grammatical accuracy. All content was subsequently reviewed and refined by the authors, who take full responsibility for the integrity and originality of the final submission.

Declaration of Conflict of Interest

There is no conflict of interest regarding publication of this paper.

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