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Enhancing Inclusive Pedagogy: The Role of Instructional Materials in Supporting Learners with Visual Impairments in Government Bilingual High School, Mendong, Yaoundé 6 Subdivision, Cameroon

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Abstract: Inclusive education has emerged as a global priority, yet learners with visual impairments continue to face systemic barriers in mainstream classrooms, particularly in Sub-Saharan Africa. This study investigates the role of inclusive instructional materials in shaping pedagogy and learner engagement within Cameroon's bilingual secondary education system, focusing on Government Bilingual High School, Mendong. A mixed methods design was employed, combining classroom observations, semi-structured teacher interviews, and learner surveys. Quantitative data were analyzed using descriptive statistics and correlation measures, while qualitative data were subjected to thematic analysis.

Findings reveal that audio resources (78% availability) and teacher-produced aids (65%) are the most accessible and strongly correlated with learner engagement (r = +0.72 and +0.68) and teacher satisfaction. In contrast, Braille textbooks (32%) and tactile graphics (28%) remain scarce, with weaker correlations to engagement (r = +0.41 and +0.39), limiting independent study and equitable participation. Assistive technologies demonstrate moderate availability (40%) and potential impact, though teachers report insufficient training to integrate them effectively. Qualitative insights highlight challenges, including resource scarcity, high costs, bilingual adaptation difficulties, and time constraints in producing improvised aids.

The study confirms that the availability of inclusive instructional materials enhances learner engagement and teacher effectiveness, while scarcity perpetuates exclusion. It underscores the need for systemic investment, teacher training, and integration of assistive technologies. By aligning with Cameroon's Vision 2035 and international commitments under the CRPD and SDG4, the findings provide actionable recommendations for strengthening inclusive pedagogy and advancing equitable education for learners with visual impairments.

Keywords: *Inclusive education; Inclusive pedagogy, instructional materials; visual impairments; Bilingual secondary schools; Cameroon;*

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Introduction

Inclusive education is a transformative vision that ensures all learners, regardless of ability, can thrive in mainstream classrooms. For students with visual impairments, adapted instructional materials such as Braille, tactile graphics, audio resources, and assistive technologies are indispensable for equitable participation. Global frameworks, including the United Nations Convention on the Rights of Persons with Disabilities (CRPD, 2006) and UNESCO's Education for All agenda, affirm this imperative, while the Universal Design for Learning (UDL) model underscores the importance of multiple means of representation and engagement. Despite these commitments, systemic barriers persist. UNESCO's 2020 Global Education Monitoring Report identifies inadequate teacher training, scarcity of adapted resources, and weak policy enforcement, even as evidence from Europe and North America demonstrates that inclusive materials significantly enhance academic achievement and social inclusion.

In Sub-Saharan Africa, resource constraints intensify these challenges. Studies in Nigeria, Ghana, Kenya, and South Africa reveal limited access to Braille and tactile materials, high costs of assistive technologies, and insufficient teacher preparation, despite strong policy frameworks. Cameroon's bilingual education system adds further complexity, requiring materials in both French and English, yet provision remains inconsistent. Research shows that teachers often improvise resources with varying quality, while systemic restructuring is needed to align with Vision 2035. The Government Bilingual High School, Mendong, exemplifies these realities, where improvisation sustains learners but lacks sustainability. This study, therefore, investigates how inclusive instructional materials shape pedagogy and learner outcomes in Cameroon's bilingual secondary schools, contributing empirical

evidence to academic discourse and offering practical insights for reform. It underscores that inclusive instructional materials are the foundation of equitable education and a prerequisite for realizing Cameroon's vision of inclusive development.

Reason for the Study

This research is undertaken to enhance inclusive pedagogy by examining the role of instructional materials in supporting learners with visual impairments. While global and regional frameworks emphasize the necessity of accessible resources, their provision remains inconsistent, particularly in bilingual contexts such as Cameroon. The Government Bilingual High School, Mendong, offers a critical case through which to explore how adapted materials (Braille, tactile graphics, audio resources, and assistive technologies) shape teaching practices and learner engagement. By situating the study within this school, the research not only addresses systemic gaps in resource provision but also contributes practical insights for strengthening inclusive pedagogy in Cameroon's bilingual secondary education system.

Statement of the Problem

Inclusive education is globally recognized as a moral and policy imperative, yet its implementation remains uneven, particularly in Sub-Saharan Africa, where learners with visual impairments are disproportionately marginalized due to the scarcity of adapted instructional materials. International frameworks such as the United Nations Convention on the Rights of Persons with Disabilities (2006) and UNESCO's Global Education Monitoring Report (2020) emphasize the necessity of accessible resources, but systemic barriers persist. In Cameroon, the bilingual education system compounds these challenges, requiring materials in both French and English, yet provision remains inconsistent and often reliant on teacher improvisation of varying quality. **The Government Bilingual High School, Mendong, exemplifies these realities, where inadequate resources hinder pedagogy and learner outcomes.** Addressing this problem is critical for advancing Cameroon's Vision 2035 and fulfilling international commitments to inclusive and equitable education; this study, therefore, examines the role of inclusive instructional materials in shaping instructional practices and learner engagement for learners with visual impairments in bilingual secondary schools.

Research Objectives

The study is guided by three key objectives:

- **OB1**: To examine the availability and use of inclusive instructional materials at Government Bilingual High School, Mendong.
- **OB2:** To analyze how these materials influence teaching practices and learner engagement.
- **OB3:** To identify challenges and propose strategies for strengthening inclusive pedagogy in Government Bilingual High School, Mendong.

Research Questions

The investigation seeks to answer the following questions:

- **RQ1** How do inclusive instructional materials impact instructional practices for learners with visual impairments?
- **RQ2:** What types of materials are most available and effective in promoting learner engagement?
- **RQ3:** What challenges hinder the effective use of these materials in the Government Bilingual High School Mendong?

Research Hypotheses

The study is guided by the following hypotheses:

- **RH1:** Availability of inclusive instructional materials is positively correlated with learner engagement among learners with visual impairments.
- **RH2:** Teachers who use adapted materials report higher satisfaction and effectiveness in instructional practices.
- **RH3:** Scarcity of Braille and tactile materials negatively affects independent study and equitable participation.

Significance of the Study

This study holds significance at multiple levels.

- **Academic Contribution:** It enriches the body of knowledge on inclusive pedagogy by providing empirical evidence from Cameroon's bilingual secondary education system, a context that remains underexplored in existing literature. By focusing on the role of instructional materials, the study advances understanding of how adapted resources shape teaching practices and learner engagement.
- **Policy Relevance:** The findings offer practical insights for policymakers and education stakeholders in Cameroon. They highlight gaps in the provision of Braille, tactile graphics, and assistive technologies, thereby informing strategies aligned with national priorities such as Vision 2035 and international commitments under the CRPD and Sustainable Development Goal 4 (SDG4).
- **Practical Impact:** For teachers and school administrators, the study underscores the importance of accessible instructional materials in fostering multisensory teaching strategies and equitable classroom participation. Recommendations on teacher training and resource allocation provide actionable pathways for improving inclusive practices.
- **Social Value:** At a broader societal level, the study advocates for equity and dignity in education. By demonstrating how inclusive instructional materials empower learners with visual impairments to participate fully in mainstream classrooms, it strengthens the case for inclusive education as a moral imperative and a driver of social cohesion.

Methodology

This study adopted a mixed-methods design, an Explanatory Sequential Design, to enrich quantitative findings by adding qualitative insights that reveal the reasons behind the numbers. Combining qualitative and quantitative approaches to provide a comprehensive understanding of how inclusive instructional materials shape pedagogy and learner engagement. The design allowed for triangulation of data, enhancing validity and reliability by integrating classroom observations, teacher interviews, and learner surveys. The research was conducted at **Government Bilingual High School, Mendong**, located in Yaoundé 6 subdivision, Cameroon. The site was selected as a representative case of Cameroon's bilingual secondary education

system. Participants included: Teachers: those directly involved in teaching learners with visual impairments. Learners: learners with visual impairments enrolled in mainstream classrooms. Administrators: school leaders providing contextual insights into resource provision. Purposive sampling was employed to ensure that participants had direct experience with inclusive instructional materials.

Data Collection Methods

Data was collected through classroom observations by observing the use and cross-checking the document use for inclusive instructional materials and teaching strategies in real time. Teacher Interviews through Semi-structured interviews were conducted to explore teachers' perceptions, challenges, and satisfaction with adapted resources. Learner Surveys with structured questionnaires to capture learners' experiences, engagement levels, and perceived effectiveness of materials.

Data Analysis and Interpretation

The study pursued data analysis from the responses of the Quantitative Data from Survey responses, which were analyzed using descriptive statistics and correlation measures to examine relationships between material availability, learner engagement, and teacher satisfaction. Qualitative Data were made through observation notes and interview transcripts, which were thematically analyzed to identify recurring patterns, challenges, and best practices.

Quantitative Analysis

Survey data from learners and teachers were analyzed using **descriptive statistics** to summarize frequencies and patterns in the availability and use of instructional materials. **Correlation analysis** was employed to test the hypotheses regarding relationships between material availability, learner engagement, and teacher satisfaction. Results revealed strong positive correlations, confirming that greater access to inclusive instructional materials was associated with higher levels of learner participation and teacher effectiveness. Conversely, limited access to Braille and tactile resources was negatively correlated with independent study and equitable participation, supporting Hypothesis 3.

Table 1: Availability and Impact of Inclusive Instructional Materials

Instructional Materials	Availability (%)	Learner Engagement (Mean Score, 1-5)	Teacher satisfaction (Mean Score, 1-5)	Correlation with Engagement(r)
Audio resources	70	4.3	4.1	+0.72
Teacher-produced aids	65	4.0	4.2	+0.68
Braille Textbook	32	2.5	2.8	+0.41
Tactile graphics	28	2.7	2.9	+0.39
Assistive Technologies (ICT)	40	3.6	3.7	+0.55

Interpretation: Audio resources and teacher-produced aids show the highest availability and strongest positive correlations with learner engagement and teacher satisfaction. Braille textbooks and tactile graphics remain scarce, reflected in lower engagement scores and weaker correlations. Assistive technologies demonstrate moderate availability and impact, suggesting potential for growth with targeted investment.

Qualitative Analysis

Table 2: Challenges Faced by Teachers in Using Inclusive Instructional Materials

Challenge Identified	**Frequency (%)**	**Teacher comments (qualitative insights)**
Scarcity of Braille textbooks and graphics	72	Limit independent study; learners rely heavily on oral explanations.
Lack of training in assistive technologies	65	Teachers reported feeling unprepared to integrate ICT tools effectively.
High cost and limited Government provision of materials.	58	Materials are often unavailable due to budget constraints.
Difficulty adapting materials into both French and English	54	Bilingual demands increase workload and reduce consistency.
Limited lesson time is allocated for providing improvised aids.	49	Teachers struggle to balance improvisation with curriculum delivery.
Teachers' unwillingness to improvise instructional materials.	40	Lack of training in workshops, seminars, training colleges, and institutions.

Interpretation

Classroom observations and teacher interviews were subjected to thematic analysis. The most critical challenge is the scarcity of Braille and tactile materials, reported by over 70% of teachers. Braille and tactile graphics were insufficient, limiting learners' autonomy. Training gaps in assistive technologies hinder effective integration, despite their proven impact on learner engagement. Policy and resource constraints (cost, bilingual adaptation) compound the problem, leaving teachers to rely on improvised aids that are time-consuming and inconsistent. Together with the first table on **availability and impact**, this second table strengthens the results section by showing both the **positive correlations** and the **barriers** that limit inclusive pedagogy.

Recurring themes included:

- Improvisation of material: Teachers frequently created their own aids, which enhanced engagement but lacked consistency.
- Scarcity of adapted resources: Braille and tactile graphics were insufficient, limiting learners' autonomy.
- Positive impact of audio resources: Learners reported greater confidence and participation when audio materials were integrated.
- Challenges in bilingual adaptation: Teachers highlighted difficulties in producing materials accessible in both French and English.

By triangulating quantitative and qualitative data, the study demonstrates that inclusive instructional materials are central to effective pedagogy. The findings confirm Hypotheses 1 and 2, showing that material availability enhances learner engagement and teacher satisfaction. Hypothesis 3 is also supported, as the scarcity of Braille and tactile resources undermines independent study. The evidence underscores the transformative potential of assistive technologies and highlights the urgent need for systemic investment and training to bridge existing gaps.

Results

Availability and Impact of Instructional Materials

The survey revealed notable variation in the availability of inclusive instructional materials at Government Bilingual High School, Mendong. As shown in **Table 1**, audio resources were the most widely available (78%), followed closely by teacher-produced aids (65%). These materials also recorded the highest learner engagement scores (mean = 4.3 and 4.0, respectively, on a 5-point scale) and strong positive correlations with engagement (r = +0.72 and +0.68). Teachers reported high satisfaction with these resources, noting that they facilitated multisensory teaching and improved classroom participation.

By contrast, Braille textbooks (32%) and tactile graphics (28%) were scarce. Learners reported lower engagement scores (mean = 2.5 and 2.7), and correlations with engagement were weaker (r = +0.41 and +0.39). Teachers emphasized that the limited supply of these materials restricted independent study and equitable participation, forcing reliance on oral explanations. Assistive technologies were moderately available (40%) and showed moderate correlations with engagement (r = +0.55), suggesting potential for growth if adequately supported.

Challenges Faced by Teachers

The qualitative data, supported by **Table 2**, highlighted systemic barriers to effective use of inclusive instructional materials. The most critical challenge was the scarcity of Braille and tactile resources, reported by 72% of teachers. This shortage undermined learners' autonomy and placed additional burdens on teachers. A second major challenge was the lack of training in assistive technologies (65%), which limited teachers' ability to integrate ICT tools effectively despite their proven benefits.

Other challenges included high costs and limited government provision (58%), difficulties in adapting materials into both French and English (54%), and time constraints in producing improvised aids (49%). Teachers frequently expressed frustration at the workload required to compensate for systemic gaps, noting that improvisation, while helpful, was unsustainable in the long term.

Integration of Findings together, the quantitative and qualitative results confirm the study's hypotheses. Availability of inclusive instructional materials is positively correlated with learner engagement and teacher satisfaction (H1 and H2). The scarcity of Braille and tactile resources negatively affects independent study and equitable participation (H3). The moderate but promising impact of assistive technologies supports the argument that their integration can significantly enhance learner achievement.

In all, the findings underscore that inclusive instructional materials are not optional supports but essential components of effective pedagogy. Their availability directly shapes both teaching practices and learner outcomes, while systemic challenges highlight the urgent need for policy intervention and resource investment.

Discussion

The findings of this study confirm the central role of inclusive instructional materials in shaping effective pedagogy and learner engagement for students with visual impairments. The strong correlations between the availability of audio resources and teacher-produced aids with learner engagement and teacher satisfaction underscore the importance of multisensory approaches. These results align with UNESCO's (2013) emphasis on Universal Design for Learning (UDL), which advocates for multiple means of representation to ensure equitable access to knowledge.

The scarcity of Braille textbooks and tactile graphics, reported by over 70% of teachers, reflects systemic gaps in resource provision. Similar challenges have been documented in Nigeria (Ajuwon, 2012) and Ghana (Nyugap, 2018), where limited access to adapted materials undermines independent study and perpetuates exclusion. This study, therefore, reinforces regional evidence that resource scarcity remains a critical barrier to inclusive education in Sub-Saharan Africa.

The moderate availability and impact of assistive technologies highlight both opportunities and challenges. While learners reported increased confidence when ICT tools were integrated, teachers expressed limited training and preparedness to use these technologies effectively. This finding resonates with Shey (2018), who noted that teacher capacity is a decisive factor in the success of inclusive practices. Without systematic professional development, the potential of assistive technologies cannot be fully realized.

The bilingual context of Cameroon adds a unique dimension to these challenges. Teachers reported difficulties in adapting materials into both French and English, a burden not widely documented in other African contexts. This finding suggests that inclusive education in Cameroon requires not only material provision but also linguistic adaptation strategies to ensure accessibility across both official languages.

Overall, the study contributes to the literature by providing empirical evidence from Cameroon's bilingual secondary education system, an underexplored context. It confirms existing theories on the importance of inclusive materials while highlighting context-specific challenges such as bilingual adaptation. The results underscore the need for systemic investment, teacher training, and policy alignment with international frameworks such as the CRPD and SDG4.

Conclusion

This study has shown that inclusive instructional materials are not just supplementary supports but essential drivers for effective teaching in bilingual secondary education. Quantitative analysis indicated that audio resources and teacher-created aids are the most accessible and have a strong connection with student engagement and teacher satisfaction. Conversely, the lack of Braille textbooks and tactile graphics continues to hinder independent learning and fair participation. Qualitative findings supported these results, emphasizing teachers' dependence on improvised materials, difficulties in bilingual adaptation, and limited training in assistive technologies.

The statistical evidence confirms the study's hypotheses: availability of inclusive materials enhances learner engagement and teacher satisfaction, while scarcity of adapted resources perpetuates exclusion. These findings underscore the transformative potential of assistive technologies and multisensory strategies in fostering equitable learning environments.

The implications are clear. Inclusive instructional materials must be prioritized as a cornerstone of Cameroon's Vision 2035 agenda and its commitment to Sustainable Development Goal 4. Increased government investment, systematic teacher training, and integration of assistive technologies are critical to bridging existing gaps. By strengthening inclusive pedagogy through accessible resources, Cameroon can move closer to realizing the vision of equitable education for all learners, ensuring that students with visual impairments are empowered to participate fully and meaningfully in mainstream classrooms.

Implications and Recommendations

Policy Implications

The study highlights the urgent need for systemic investment in inclusive instructional materials within Cameroon's bilingual secondary education system. The implications are clear. Inclusive instructional materials must be prioritized as a cornerstone of Cameroon's Vision 2035 agenda and its commitment to Sustainable Development Goal 4. The scarcity of Braille textbooks and tactile graphics, coupled with limited assistive technologies, undermines equitable participation for learners with visual impairments. Policymakers must prioritize resource allocation in line with Cameroon's **Vision 2035** and international commitments under the **CRPD** and **SDG4**. Establishing centralized resource centers, similar to models in Kenya, could ensure consistent production and distribution of adapted materials in both French and English.

Educational Practice

For teachers, the findings underscore the importance of accessible materials in fostering multisensory pedagogy and learner engagement. Professional development programs should be expanded to include training in the use of assistive technologies and strategies for bilingual adaptation of resources. Schools should also encourage collaborative practices, where teachers share improvised aids and best practices to reduce individual workload and enhance sustainability. Increased government investment,

Administrative Recommendations

School administrators play a critical role in bridging policy and practice. They should advocate for increased funding, establish partnerships with NGOs and international organizations, and integrate inclusive resource planning into school development strategies. Monitoring and evaluation mechanisms must be strengthened to track the availability and effectiveness of instructional materials, ensuring accountability and continuous improvement.

Social and Community Impact

Beyond the classroom, inclusive instructional materials contribute to social equity by empowering learners with visual impairments to participate fully in education and society. Community awareness campaigns can help reduce stigma and mobilize support for inclusive practices. By investing in accessible resources, Cameroon can foster a culture of inclusion that extends beyond schools into broader social and economic development.

Ethical Considerations

Ethical approval was obtained from relevant authorities, and informed consent was secured from all participants. Confidentiality and anonymity were maintained throughout the study, with data used solely for academic purposes.

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