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Harnessing Artificial Intelligence for Optimal Inclusion of the Visually Impaired Early Childhood Education Learners in Chimanimani District

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Abstract: *This study explores how Artificial Intelligence (AI) can be harnessed to enhance the optimal inclusion of the visually impaired learners in Early Childhood Education (ECE) environments within Chimanimani District. Furthermore, it delves into how context-appropriate AI tools and strategies can be capitalized to bridge accessibility gaps and promote equitable learning outcomes. Despite national commitments to inclusive education, practical implementation remains fragmented and insufficient. The Social Model of Disability underpins the theoretical framework for this study. This study utilized a sequential explanatory mixed-methods design in understanding the secondary system of therapeutic alliance from the perspectives of parents and caregivers of children with visual impairements. Data were collected through field observations and document analysis of institutional records from 15 ECE centers, 30 ECE educators were interviewed, and 30 parents / guardians were involved in focus group discussions. The study finds out that a number of ECE centers in Chimanimani lack accessible learning materials such as braille texts and audio resources, which are adaptive to the needs of the visually impaired learners. Additionally, overcrowded classrooms and ECE teachers with limited or no expertise, significantly hinder the implementation of inclusive education practices. The study recommends that ECE educators need continuous professional development on inclusive pedagogies and embrace AI-based assistive technologies adhering to the needs of the visually impaired learners. Educators should integrate AI tools such as screen readers and voice interfaces into daily lessons to enhance accessibility. Collaboration with community stakeholders and leveraging open-source platforms can support the sustainable use of AI in low-resource ECE environments.*

Keywords: Artificial Intelligence (AI), Digital World, Optimal Inclusion, Visually Impaired Learners, Early Childhood Education (ECE) Learners, Chimanimani District.

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1. Introduction

The advent of Artificial Intelligence (AI) marks a pivotal moment in the evolution of educational practice, particularly in addressing the needs of marginalized and differently abled learners. Among the most pressing challenges within inclusive education is the provision of equitable learning opportunities for visually impaired children, especially during the foundational years of Early Childhood Education (ECE). These formative years are critical for cognitive, social, physical, and emotional development; yet, for visually impaired learners in under-resourced nations such as Zimbabwe, access to quality