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Breaking the Cycle of Academic Underachievement: Nutrition-Sensitive Interventions and Determinants of Grade 7 Zero Pass Rates in Zimbabwean Primary Schools

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Abstract
Grade 7 Zero Pass Rates among Zimbabwean primary schools are increasingly associated with a range of complex factors, notably food insecurity and suboptimal nutritional status, which remain under-researched determinants. In environments with limited resources, lack of access to nutritionally adequate diets negatively impacts students' cognitive development, focus, and school engagement, thereby reducing their academic performance in essential subjects, such as literacy and numeracy. This study explores the potential of nutrition-sensitive interventions to address educational underachievement and interrupt the ongoing cycle of poor examination results. Persistent zero pass rates among Grade 7 learners in Zimbabwean primary schools constitute a critical impediment to educational attainment, reflecting a complex interplay of socio-economic deprivation, institutional constraints, and individual learner factors. This study examines the determinants of these dismal academic outcomes, emphasizing the role of nutritional deficits and household food insecurity in undermining cognitive function, attention, and classroom engagement. Drawing on empirical evidence from Zimbabwe and broader Sub-Saharan Africa, the analysis demonstrates that children experiencing chronic undernutrition, inadequate dietary diversity, and limited access to learning resources exhibit significantly lower literacy, numeracy, and examination performance. Nutrition-sensitive interventions, particularly school feeding programmes (SFPs), emerge as pivotal mechanisms to ameliorate these deficits. Rigorous evaluations from Ghana, Kenya, Ethiopia, Tanzania, and Malawi reveal that SFPs enhance attendance, reduce absenteeism, improve cognitive function, and elevate academic achievement, especially when integrated with complementary educational strategies such as remedial teaching and teacher capacity development. The findings underscore the necessity of adopting multi-dimensional, evidence-based academic recovery interventions that synergistically address nutritional, pedagogical, and socio-economic determinants of learning. By elucidating the nexus between child nutrition and academic performance, this study provides critical insights for policymakers, educators, and development practitioners aiming to eradicate zero pass rates and promote equitable educational outcomes in Zimbabwe.

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1. Introduction

Primary school years represent a vital stage characterized by notable changes in physical, cognitive, and emotional aspects. Education is widely acknowledged to be a crucial factor in driving socioeconomic progress, alleviating poverty, and building human capital (UNESCO, 2020) [54]. In numerous developing nations, primary education serves as the cornerstone for lifelong learning, providing children with the fundamental literacy, numeracy, and cognitive abilities necessary for future academic and career achievements. Nevertheless, on a global scale, learning poverty—the inability of children to read and understand a simple

text by the age of 10—remains a significant issue. The UNESCO and World Bank report that over 53% of children in low- and middle-income countries are unable to read proficiently by the end of primary school (World Bank, 2021; UNESCO, 2021) [62, 56].

Despite considerable funding directed towards primary education in recent years, sub-Saharan Africa continues to struggle with primary school completion rates that fall significantly short of the global average, coupled with ongoing challenges in learning outcomes (International Monetary Fund [IMF], 2024; UNESCO, 2024) [25, 57]. A combination of factors, including household poverty, teacher shortages, insufficient learning materials, and chronic malnutrition, collectively hampers children's ability to learn effectively (Aurino *et al*., 2018) [2]. Malnutrition during the first 1,000 days of life, along with ongoing undernutrition in school-aged children, has been consistently associated with diminished cognitive development, reduced memory retention, and impaired academic performance (Grantham-McGregor *et al*., 2014; Prado & Dewey, 2014) [23, 44]. School feeding programs (SFPs) have become a significant nutrition-sensitive educational intervention throughout sub-Saharan Africa. These programs offer meals to students during the school day to mitigate hunger, enhance school attendance, improve classroom participation, and support learning outcomes (Gelli *et al*., 2019; Drake *et al*., 2017) [30, 19]. Research from Ghana, Kenya, and other African nations indicates that integrating school meals with complementary interventions, such as remedial teaching, teacher training, and community engagement, results in greater improvements in literacy, numeracy, and examination performance than feeding alone (Bundy *et al*., 2018) [6].

Zimbabwe has traditionally boasted one of the highest literacy rates in Africa, a result of significant investments in educational infrastructure, teacher training, and policies promoting universal primary education since gaining independence (Nziramasanga, 1999) [42]. Nonetheless, years of economic turmoil, structural adjustment programs, and growing socioeconomic disparities have undermined these achievements, especially in rural and disadvantaged regions. A particularly troubling development is the rise of zero-pass rate schools, where no students succeed in passing the Grade 7 national exams conducted by the Zimbabwe School Examinations Council. These results highlight profound structural issues, such as poverty, restricted access to educational resources, teacher shortages, and insufficient school facilities (Mpofu & Mafa, 2019) [35]. Research has demonstrated that children's nutrition is a crucial factor influencing learning outcomes in Zimbabwe. Learners who experience food insecurity exhibit diminished concentration, reduced cognitive functioning, and limited classroom engagement, all of which negatively impact academic achievement (Chinyoka, 2014; Ndava *et al*., 2021) [13, 38]. Although Zimbabwe has implemented school feeding programs in certain regions, the persistence of zero-pass rates suggests that nutritional interventions alone are inadequate. Addressing learning poverty necessitates integrated academic recovery strategies that combine nutritional support with remedial teaching, teacher capacity development, and parental or community engagement (Bundy *et al*., 2018; Gelli *et al*., 2019) [6, 30].

This systematic review examined the interconnected influences of nutrition, teaching methods, and socioeconomic conditions on educational outcomes. It compiles empirical research on the factors contributing to zero-pass rates and evaluates the success of nutrition-focused academic recovery programs, particularly in Zimbabwe and similar sub-Saharan African regions. By gathering evidence from influential studies and regional assessments, the review seeks to guide policymakers, educators, and development professionals in implementing strategies to reduce poverty and enhance grade 7 exam results

2. Methodology

2.1. Study design

The study utilized a systematic review methodology, adhering to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework, to ensure transparency, rigor, and replicability in evidence synthesis. The review aimed to consolidate empirical evidence regarding the relationship between nutrition-sensitive interventions, such as school feeding programs, and academic outcomes in primary school populations, with a particular emphasis on Zimbabwe and comparable Sub-Saharan African contexts.

A comprehensive literature search was conducted across multiple academic databases, including Scopus, Web of Science, PubMed, and Google Scholar, to identify relevant studies published between 2000 and 2025. The search employed a combination of keywords and Boolean operators, including “school feeding,” “academic performance,” “nutrition and learning,” “primary education outcomes,” “school meal programs,” and “learning poverty.” This approach facilitated the identification of peer-reviewed articles addressing the intersections of nutrition, school-based interventions, and educational outcomes across diverse settings.

Studies were included in the review if they met the following criteria: they examined school feeding or nutrition interventions, investigated educational outcomes, focused on primary school populations, and were peer-reviewed articles indexed in major academic databases. Conversely, studies were excluded if they focused solely on secondary or tertiary education, lacked empirical data, or were derived from non-peer-reviewed sources, such as opinion pieces, editorials, or unpublished reports.

For each eligible study, key information was systematically extracted, including the study location, sample size, study design, type of intervention, and measured academic outcomes. This standardized extraction process enabled the synthesis of findings across heterogeneous study designs and geographical contexts while maintaining fidelity to the principles of evidence-based reviews. The collated data were subsequently analysed to identify patterns, gaps, and contextual factors influencing the effectiveness of nutrition-sensitive academic recovery interventions in reducing zero-pass rates and enhancing learning outcomes.

2.2. Problem Statement

Despite the implementation of educational reforms in Zimbabwe, the persistent issue of zero pass rates among Grade 7 students in certain primary schools underscores deep-seated structural challenges that extend beyond mere teaching practices. In many communities grappling with food insecurity, students experience chronic nutritional deficiencies that impair cognitive function, reduce attention spans, and hinder active participation in educational activities. These obstacles disproportionately affect

performance in fundamental subjects such as reading and mathematics, thereby perpetuating systemic academic underperformance. However, the impact of nutrition-related factors on examination failures is not sufficiently integrated into educational policies and intervention strategies. This study aims to investigate how nutrition-sensitive interventions can address the underlying causes of poor academic performance and foster sustainable improvements in Grade 7 outcomes.

2.3. Research Objectives and Research Questions

General Objective

To investigate the causes of zero pass rates in Grade 7 primary schools and develop an integrated nutrition and academic recovery initiative to improve learning outcomes.

Specific Objectives

1. To identify socio-economic, nutritional, and educational factors contributing to zero pass rates in Grade 7 primary schools.
2. To examine the relationship between student nutrition status and academic performance.
3. To assess the effectiveness of current learning support mechanisms in affected schools.
4. To design and evaluate an integrated school-based nutrition and academic recovery programme.
5. To propose sustainable policy interventions to eliminate zero pass rates.

Research Questions

1. What factors contribute to zero pass rates in Grade 7 primary schools?
2. How does student nutrition status influence academic performance and cognitive functioning?
3. What are the institutional and community-level barriers to improved learning outcomes?
4. How effective are remedial learning programmes in improving Grade 7 examination performance?
5. Can an integrated nutrition and academic support programme significantly improve pass rates?

3. Results & Discussion

3.1. Theoretical Foundations: Human Capital, Ecological Systems, and Capability Perspectives on Zimbabwe's Zero Pass Rate Crisis

3.1.1. Human Capital Theory

Human Capital Theory asserts that education functions as a strategic investment that enhances individuals' knowledge, skills, and productivity, thereby promoting sustained economic growth and social development. Foundational contributions by Theodore Schultz and Gary Becker emphasize that investments in education, health, and nutrition improve human capabilities, which subsequently lead to increased labour productivity and economic returns. At the primary school level, foundational competencies in literacy and numeracy are essential components of human capital formation. The inability of learners to acquire these competencies has implications that extend beyond individual academic outcomes to broader socioeconomic development, as inadequately educated populations undermine the productivity and competitiveness of national economies (Becker, 1993; Schultz, 1961) [3, 48].

In Zimbabwe, the persistent zero pass rates in some Grade 7 primary schools indicate a failure to establish foundational human capital during the early stages of education. Numerous schools serving rural and low-income communities face significant constraints, such as household poverty, food insecurity, and limited access to learning resources. These conditions diminish learners' cognitive readiness and academic engagement, ultimately resulting in poor examination outcomes. From a human capital perspective, interventions such as nutrition-sensitive school feeding programs, enhanced teaching capacity, and improved access to learning materials represent critical investments that augment students' learning potential and strengthen long-term human capital development (World Bank, 2019; UNESCO, 2022) [61, 54].

3.1.2. Ecological Systems Theory

Ecological Systems Theory, formulated by Urie Bronfenbrenner, offers a comprehensive framework for analysing the interactions between various environmental systems and children's developmental and educational outcomes. This theory asserts that child development occurs within a series of interconnected layers of influence, including the microsystem (family and school), mesosystem (interactions between family and school), ecosystem (community structures and institutions), and macrosystem (broader socioeconomic and policy environments). Consequently, educational achievement cannot be attributed solely to individual ability; rather, it is the result of the cumulative effects of these interacting environmental factors. In the Zimbabwean context, zero-pass rates frequently arise from the combined impact of household, school, and community constraints. Many students attend under-resourced schools characterized by teacher shortages, overcrowded classrooms, and insufficient teaching materials. Concurrently, household food insecurity and limited parental educational support diminish students' capacity to engage effectively with their studies. Ecological Systems Theory indicates that enhancing academic outcomes necessitates interventions that concurrently address these interconnected environments. Integrated approaches, such as school feeding programmes, parental engagement initiatives, teacher professional development, and improved school infrastructure, can fortify the learning ecosystem and mitigate the structural conditions contributing to zero-pass rates (Mutekwe, 2017; Moyo, 2019) [36, 33].

3.1.3. The Capability Approach

The Capability Approach, as proposed by Amartya Sen and further elaborated by Martha Nussbaum, reorients the focus of development analysis from economic outputs to the enhancement of human freedoms and opportunities. Within this paradigm, education is regarded as a fundamental capability that empowers individuals to acquire knowledge, engage in societal activities, and pursue livelihoods they value. Consequently, educational deprivation signifies not merely a deficiency in academic achievement but also a restriction of individuals' opportunities for social and economic engagement (Sen, 1999; Nussbaum, 2011) [49, 40].
When applied to the Zimbabwean education system, persistent zero pass rates highlight structural inequalities that limit children's opportunities to develop essential capabilities. Learners in marginalized rural and low-income communities frequently encounter obstacles, such as hunger,

inadequate learning environments, and limited access to qualified teachers, all of which impede their ability to attain meaningful educational outcomes. From a capability perspective, addressing zero pass rates necessitates policies that expand learners' genuine opportunities for success, including enhanced nutrition, equitable access to quality education, and supportive learning environments. Integrated nutrition-sensitive academic recovery programs can thus play a transformative role in expanding educational capabilities and improving long-term life opportunities for disadvantaged learners (UNICEF, 2021; UNESCO, 2022) [56, 54].

3.2. Conceptual Model Linking Zero Pass Rates in Primary Schools to Integrated Nutrition and Academic Recovery Interventions

The findings of this review indicate that zero pass rates in grade 7 primary schools arise from the interaction of structural, nutritional, and institutional factors. The conceptual framework in Figure 1 illustrates how these determinants operate across multiple levels to influence learning outcomes. At the structural level, socioeconomic constraints, such as poverty, household food insecurity, and rural marginalization, limit children's access to adequate nutrition and educational resources. Globally, children from disadvantaged households experience higher learning deficits, with poverty and hunger recognized as major drivers of the global learning crisis (World Bank, 2019; UNESCO, 2022) [61, 54]. In Sub-Saharan Africa, food insecurity is strongly associated with lower school attendance, higher dropout rates, and poorer academic performance (Aurino *et al*., 2018; Bundy *et al*., 2018) [2, 6]. Similar patterns are evident in Zimbabwe, particularly in rural and peri-urban communities, where persistent socioeconomic challenges undermine educational achievement (Moyo, 2019) [33].

At the individual learner level, insufficient nutrition detrimentally impacts cognitive development, focus, and memory retention, leading to reduced classroom participation and the accumulation of learning gaps that can ultimately result in exam failures. These problems are further intensified by constraints at the school level, such as a shortage of teachers, limited teaching capabilities, insufficient educational materials, and inadequate infrastructure, all of which undermine the effectiveness of instruction (Mutekwe, 2017) [36]. In summary, the evidence suggests that zero pass rates are not merely indicative of poor academic performance but are instead the result of intertwined structural and nutritional challenges. Therefore, it is crucial to implement comprehensive interventions that simultaneously address hunger, improve teaching quality, enhance learning resources, and foster parental involvement to improve educational outcomes and reduce the prevalence of schools with zero pass rates.

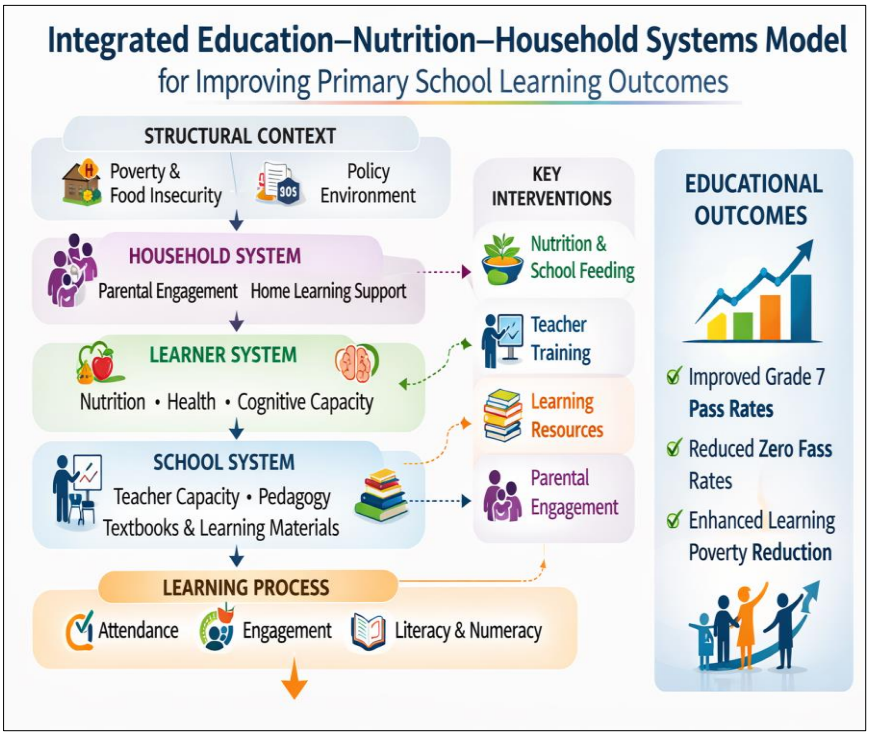

Fig 1: Integrated Education–Nutrition–Household Systems Model for Improving Primary School Learning Outcomes and Reducing Zero Pass Rates.

Figure 1 illustrates a comprehensive framework that integrates the structural, household, learner, and school systems that impact primary school performance. The model delineates four complementary intervention pathways: nutrition-sensitive school feeding and gardens, teacher training and mentorship, provision of learning resources, and parental engagement programs. Collectively, these interventions enhance attendance, classroom participation, literacy, and numeracy, ultimately increasing grade 7 pass rates and decreasing the number of schools with zero pass rates. The framework underscores that educational underperformance in low-resource settings is driven by a web of interconnected socioeconomic, nutritional, and institutional constraints.

Evidence from global and regional studies indicates that multi-component interventions, which combine nutritional support with academic recovery strategies, are more effective than single-sector approaches in enhancing learning outcomes (Bundy *et al*., 2018; Gelli *et al*., 2019; Ndava *et al*., 2021) [6, 30, 38]. In Zimbabwe, such integrated approaches

address both immediate obstacles, such as hunger and poor classroom engagement, and structural challenges related to teaching quality, educational resources, and household support (Moyo, 2019) [33]. Overall, the model functions as both an analytical framework for understanding zero PAs and a planning tool for designing evidence-based interventions. By integrating nutrition, education, and community support systems, the framework highlights pathways for strengthening foundational learning and improving examination performance in Zimbabwean primary schools.

3.3. Determinants of Learning Outcomes in Primary Education

Learning outcomes in primary education are shaped by a complex interplay of factors at the learner, school, and household levels (Calingin & Ferenal, 2025; Sumastre, & Oco, 2025; Wati, & Afifah, 2023; Shen-Berro, 2023) [7, 52, 59, 50]. In many low-resource educational systems, such as Zimbabwe, persistent underperformance and zero-pass rates in Grade 7 examinations cannot be attributed to a single cause (World Bank, 2019) [61]. Instead, they result from the cumulative effects of nutritional deprivation, limited teacher capacity, inadequate learning resources, and constrained household environments. Research across Sub-Saharan Africa indicates that children's ability to acquire foundational literacy and numeracy skills depends on the interaction of these determinants, which collectively influence learning engagement, instructional effectiveness, and academic achievement (; UNESCO, 2022) [54].

In Zimbabwe, these challenges are particularly pronounced in rural and peri-urban primary schools, where poverty, food insecurity, and limited educational infrastructure restrict learning opportunities. Many schools operate with insufficient teaching materials, high pupil–teacher ratios, and limited support for struggling learners. Concurrently, household constraints, such as low parental education and limited access to study resources, further undermine learning outcomes. Therefore, addressing zero-pass rates requires a multidimensional understanding of the factors influencing academic performance. The following sections examine four key determinants: nutrition and cognitive development, teacher capacity and pedagogy, learning materials and school resources, and household and community factors.

3.3.1. Nutrition and Cognitive Development

Child nutrition is a critical determinant of learning capacity. Nutrition plays a crucial role in maintaining life, supporting daily bodily functions, immune health, and overall well-being throughout life (World Health Organization, 2023) [63]. It is shaped by both the amount and quality of food consumed, including adequate calories and essential macronutrients and micronutrients, which together determine a person's nutritional status (Gibson, 2020) [22]. Nutrition encompasses more than just energy intake; it also involves the nutrient density and variety of the diet—the balance of proteins, fats, vitamins, and minerals—that support metabolic processes, tissue growth, and brain development (Michaelsen *et al*., 2017) [31].

A sufficient intake of calories and nutrients is especially vital during childhood and adolescence, periods characterized by rapid physical growth, brain maturation, and synaptic development (Black *et al*., 2013) [5]. Studies have shown that inadequate nutrition during these critical years is linked to delayed cognitive development, reduced attention, and lower academic performance, whereas well-nourished children demonstrate improved concentration, memory, and learning outcomes (Prado & Dewey, 2014) [44]. Overall, this body of evidence highlights that optimal nutrition is essential not only for physical health but also for cognitive functioning and educational success throughout childhood.

The primary school years constitute a crucial phase marked by significant transformations in the physical, cognitive, and emotional domains. Adequate nutrition is imperative to meet increased physiological demands and support cognitive development and academic performance (Nikalansooriya, *et al* 2025) [39]. Nutritional deficiencies, such as inadequate protein and energy intake or insufficient micronutrients, significantly affect cognitive abilities, learning capacity, and overall brain health. Implementing nutrition-focused strategies within public school curricula and addressing nutritional disparities could markedly enhance cognitive and academic outcomes for primary school-aged children in low- and middle-income countries.

Ensuring that children receive adequate macronutrients and micronutrients during their primary school years is essential for their physical growth and cognitive development. This nutritional foundation underpins cognitive functions such as attention, memory, and problem-solving, which are critical for effective learning in the classroom (Black *et al*., 2013) [5]. Children experiencing undernutrition, including chronic stunting or deficiencies in essential micronutrients, often face delays in cognitive development, reduced classroom participation, and diminished academic achievement (Aurino *et al*., 2018) [2].

Protein-calorie malnutrition further impedes learning behaviors and neurological development, underscoring the extensive impact of inadequate diets on children's health and educational outcomes (Nikalansooriya *et al*., 2025) [39]. Recent global studies highlight the significance of specific micronutrients, such as B vitamins and vitamins C, D, and E, in supporting cognitive functions, with deficiencies associated with poorer performance on standardized tests assessing memory and executive function (Gibson, 2020) [22]. Emerging research on the gut-brain connection suggests that metabolites produced by the microbiome can influence host metabolism. and brain activity, serving as epigenetic regulators of cognitive processes (Riley *et al*., 2021).

Research conducted in Zimbabwe has demonstrated that children from households experiencing food insecurity, characterized by diets lacking variety and essential nutrients, tend to achieve lower literacy and numeracy scores than their well-nourished peers (Ndava *et al*., 2021) [38]. Studies in rural areas have shown that undernourished primary school students exhibit reduced attention spans, slower task completion rates, and increased absenteeism, all of which contribute to poorer examination outcomes (Chinyoka, 2014; Mpofu & Mafa, 2019) [13, 35]. These studies underscore the critical importance of nutrition during primary school years in influencing physical health, cognitive abilities, and academic performance, particularly in resource-limited environments such as Zimbabwe, where food insecurity and educational challenges are closely linked.

Evidence from Zimbabwe supports this observation. Chinyoka (2014) [13] found that students with inadequate nutrition had lower concentration levels, less engagement, and poorer examination results. Mpofu and Mafa (2019) [35] observed that children from food-insecure families often arrive at school fatigued and undernourished, which

adversely affects their attention, memory, and ability to retain information. These findings illustrate that nutrition is both a prerequisite and facilitator of learning, especially in rural and disadvantaged settings.

3.3.2. Teacher Capacity and Pedagogy

Capacity building, as defined by Deprez *et al*. (2021) as "the process of developing and strengthening skills and instinctual abilities," plays a pivotal role in influencing the dynamics of organizations, including educational institutions. Within the education sector, teacher capacity building emerges as a critical component, aiming to enhance educators' skills and knowledge to improve classroom efficiency. The importance of such initiatives is emphasized by Kumari (2022), who describes capacity development as the process through which individuals and organizations acquire, enhance, and maintain the essential resources necessary for competent work (Deprez *et al*., 2021) [16].

According to Reimers (2020), initiatives aimed at building capacity have been proven to greatly enhance teachers' skills in designing and organizing lessons that meet educational goals (Reimers, 2020) [46]. Jepketer *et al*. (2015) emphasized the necessity for educators to receive training in various domains, including mastery of their subject area, understanding of pedagogical techniques, curriculum expertise, and keeping abreast of the latest developments in the field, such as the incorporation of technology in educational settings (Jepketer *et al*., 2015) [27].

Teacher capacity building has been shown to improve instructional effectiveness and student outcomes in schools (Werimba, 2024) [60]. Teacher capacity and instructional quality are critical determinants of student learning outcomes in primary education. Bennett (2024) argues that teacher professional capacity is critical for effective learning environments (Bennett, 2024) [4]. Effective teaching necessitates robust subject knowledge, appropriate pedagogical skills, and the ability to tailor instruction to the diverse needs of learners. When teachers receive limited training or lack adequate support, instructional quality may diminish, leading to ineffective classroom practices and reduced learning gains among pupils. In numerous Zimbabwean primary schools, particularly in rural areas, teachers often encounter challenging working conditions that impede effective instruction. Large class sizes, limited teaching materials, and high workloads can diminish opportunities for individualized attention and learner support. These constraints may weaken classroom engagement and contribute to the persistence of learning gaps among struggling students. Without targeted instructional support, learners who fall behind in the early grades may continue to experience difficulties throughout their primary education.

Remedial teaching programs are one strategy for addressing learning deficits among underperforming students. These programs focus on providing additional instructional support to learners who struggle with foundational literacy and numeracy skills. Remedial instruction typically involves targeted lessons, small-group teaching, and differentiated learning activities designed to address specific learning challenges. Evidence suggests that structured remedial programs can significantly improve learning outcomes when implemented consistently and supported by trained teachers.

Learner-centred pedagogical approaches also play a critical role in enhancing classroom learning. Unlike traditional teacher-dominated instruction, learner-centred methods encourage active participation, problem-solving, and collaborative learning. Techniques such as group discussions, interactive questioning, and peer learning help students engage more deeply with educational content and develop critical thinking skills. In the context of Zimbabwe's primary schools, strengthening teacher professional development and promoting learner-centred pedagogies can significantly enhance instructional effectiveness and support improved academic performance.

3.3.4. Learning Materials, Facilities and School Resources

The provision of adequate learning materials and school resources constitutes a critical determinant of educational quality and learning outcomes. The Department for International Development (DFID, 2007) emphasizes that the attributes of teachers, along with the presence and sufficiency of physical resources and teaching materials, are crucial for effective learning and students' academic success (Bontoux & Buchan, 2007) [18]. The Organisation for Economic Co-operation and Development (OECD, 2007) links differences in students' educational achievements to the unequal distribution of resources among schools. Akungu (2014) pointed out that students receive a lower quality of education because there are not enough teaching and learning resources (Akungu, 2014) [1]. This problem is worse in crowded classrooms. Consequently, physical resources not only affect the quality of education but also influence the motivation of both students and teachers, thereby impacting educational outcomes.

As a result of the introduction of mandatory and free education, coupled with the removal of tuition fees in Uganda, Tanzania, Malawi, and Kenya, the available physical facilities and resources have been pushed to their limits (Fisher, 2012) [20]. Textbooks, teaching aids, and other instructional materials are indispensable for supporting both educators and students by facilitating structured learning and reinforcing classroom instruction. In Ghana, Dei (2013) found that rural community schools struggled with deteriorating physical infrastructure, insufficient planning, and a shortage of materials and teaching staff, leading to poor academic outcomes (Dei, 2013) [15]. Consequently, the limited physical facilities and resources have become overstretched because of the declaration of compulsory and free education, along with the subsequent elimination of fee payments in Uganda, Tanzania, Malawi, and Kenya (Fisher, 2012) [20]. When students have access to appropriate textbooks and learning resources, they are better equipped to follow lessons, complete assignments, and independently review key concepts. Nevertheless, in numerous low-income educational systems, shortages of textbooks and teaching materials persist as a significant challenge.

Some rural schools face a shortage of educational resources, compelling several students to share one textbook or rely solely on teachers' verbal explanations during classes. This situation limits opportunities for self-study and hampers students' ability to consolidate their understanding of classroom material. In rural primary schools the ongoing scarcity of textbooks necessitates that multiple students use a

single copy, impeding their capacity for independent learning and leading teachers to primarily depend on oral instruction (Chidarikire *et al*. 2021).

Material constraints restrict the extent of curriculum coverage and reduce the likelihood of students engaging with educational content outside the classroom. Such resource limitations can significantly weaken the effectiveness of classroom teaching and contribute to less-than-ideal academic results. Structured pedagogy programs have been introduced in various countries to improve teaching quality and learning outcomes in environments with limited resources (UNICEF Zimbabwe 2023) [55]. These programs provide teachers with comprehensive lesson plans, instructional guides, and structured learning materials aimed at ensuring consistent and effective teaching practices.

Structured pedagogy models frequently incorporate regular teacher training, classroom coaching, and monitoring systems to support effective implementation. Empirical evidence indicates that structured pedagogical interventions can significantly enhance literacy and numeracy outcomes in primary education by standardizing instructional practices and ensuring the effective delivery of essential learning content. In the Zimbabwean context, improving access to textbooks, teaching aids, and structured instructional materials can fortify classroom learning and support efforts to reduce zero-pass rates in primary schools.

3.3.5. Household and Community Factors

Globally, the environments within homes and communities play a crucial role in shaping children's educational experiences and learning outcomes. Elements such as parents' educational background, family income, and participation in educational activities greatly affect cognitive growth, school attendance, and academic success (Desforges & Abouchaar, 2003; UNICEF, 2021) [17, 56]. Children from wealthier families usually have access to books, digital tools, and good places to study. In contrast, children from low-income or marginalized families often face material shortages, less supervision, and fewer opportunities to improve academically (OECD, 2019) [43]. Additionally, factors at the community level, such as local educational support systems, peer networks, and community engagement in schools, can strengthen or weaken the impact of household environments on educational outcomes (Reimers & Chung, 2016) [45]. Household and community factors together influence the mental and emotional skills needed for school success. This highlights the importance of programs that improve both home and community environments, as well as schools.

Factors such as parental education, household income, and access to supportive learning environments significantly influence children's academic performance. Parents with higher educational attainment are often better equipped to support their children's learning by assisting with homework, encouraging reading, and fostering a positive attitude toward education. Conversely, children from households with limited educational resources may encounter additional barriers to academic success. Poverty can constrain families' ability to provide essential learning materials, such as books, school supplies, and access to quiet study spaces.

Children's educational experiences and academic success are heavily influenced by their home and community settings. Research in Zimbabwe has shown that when parents are involved in their children's education, students perform better in school. Supportive actions by parents lead to better grades and a positive attitude toward learning (Hlanga *et al*., 2021) [24]. In situations where parents have limited resources or lower levels of formal education, the ability to provide meaningful support for homework, maintain school–home communication, and oversee learning activities is often diminished, potentially hindering children's academic success and engagement with education (Tenha, 2022) [53]. Factors like family income and parents' education affect access to learning tools and the home learning setting. This influences how ready and motivated children are to learn (Chindanya, 2011; Nyemba & Chitiyo, 2018) [12, 41]. These issues are particularly pertinent in low-income and rural areas, where limited household capabilities can exacerbate school-related challenges and lead to poor academic outcomes.

In many rural communities in Zimbabwe, learners are also required to contribute to household labour or agricultural activities, thereby reducing the time available for studying and homework. The home learning environment is thus a critical factor influencing educational achievement. Supportive households that encourage reading, allocate study time, and maintain communication with teachers can significantly enhance children's learning outcomes. Community involvement in education can also play a vital role in strengthening school performance.

Parent–teacher associations (PTAs), community education committees, and local support initiatives are integral to enhancing school governance and accountability. These groups gather money and supplies, check how schools are doing, help teachers improve, and get parents involved. This improves the learning environment (Chikoko, 2016; Moyo, 2019) [11, 33]. In Zimbabwe, PTAs and community-based education committees have been demonstrated to contribute to improved school infrastructure, increased learner attendance, and enhanced supervision of teaching and learning activities, particularly in rural and peri-urban schools, where government resources are limited (Mutekwe & Modiba, 2019) [37]. These programs encourage schools and local communities to work together. This teamwork helps create a supportive environment and reduce the problems that lead to poor grades and many students failing in primary schools.

Addressing zero-pass rates in Zimbabwean primary schools necessitates greater attention to these household and community influences. Interventions that promote parental engagement, provide community-based educational support, and address household poverty can strengthen the broader learning ecosystem. When combined with improvements in nutrition, teaching quality, and school resources, such initiatives can create a more supportive environment for children's learning and help improve primary school academic outcomes.

3.4. School Feeding Programmes in Zimbabwe & SSA

School nutrition programmes (SNPs) are among the most prevalent nutrition-sensitive interventions implemented worldwide. These programmes provide meals to over 368 million children globally, aiming to mitigate hunger, boost school attendance, and enhance academic achievement

(Bundy *et al*., 2018) [6]. Recent empirical studies conducted in Zimbabwe and the broader Sub-Saharan Africa region from 2015 to 2025 consistently demonstrate that SFPs positively influence nutritional and educational outcomes. In Zimbabwe, Ndava *et al*. (2021) and Chinyoka (2014) found that children from food-insecure households or those experiencing malnutrition performed worse in literacy, numeracy, and concentration, emphasizing the critical role of adequate nutrition for learning (Ndava *et al*., 2021; Chinyoka, 2014) [38, 13].

Table 1: Nutrition and Academic Outcomes (Zimbabwe & SSA, 2015–2025)

Study	Country	Design	Sample Size	Intervention / Exposure	Outcome Measures	Key Findings
Chinyoka, 2014	Zimbabwe	Case study	19	Nutritional status	Concentration, grades	Malnutrition → lower concentration & grades
Ndava *et al*., 2021	Zimbabwe	Survey	216	Household food security	Literacy, numeracy	Food-insecure children performed worse
Aurino *et al*., 2018	Ghana, Kenya	Quasi-experimental	4,000	School feeding	Math & literacy	School meals improved test scores
Bundy *et al*., 2018	Multi-country	Systematic review	39 studies	Feeding programmes	Attendance, cognition	Feeding → ↑ attendance & cognitive performance
Gelli *et al*., 2019	Ghana	Cluster-RCT	2,125	Home-grown school meals	Height-for-age, cognitive scores	Significant improvement in growth & learning
Addis Ababa SFP Study, 2020–21	Ethiopia	Longitudinal	~4,500	School meals	Academic scores, attendance, enrolment	SFP improved attendance, enrolment, and academic performance
Mketo *et al*., 2022	Tanzania	Mixed methods	Not specified	School feeding	Attendance, participation, exam scores	Attendance & participation improved; examination scores higher post-SFP
Magombo *et al*., 2025	Malawi	Comparative cross-sectional	Not specified	School feeding vs. non-feeding schools	Learning outcome tests	SFP associated with higher learning scores; some specific tasks showed negligible differences

Complementary studies across the region corroborate these findings: Aurino *et al*. (2018) reported higher literacy and mathematics scores among children receiving school meals in Ghana and Kenya, while Gelli *et al*. (2019) observed improvements in both cognitive performance and growth metrics through home-grown school feeding programmes. Multi-country systematic reviews (Bundy *et al*., 2018) highlight that feeding programmes increase attendance, classroom engagement, and cognitive performance, indicating a clear link between regular school meals and enhanced learning outcomes (Aurino *et al*., 2018; Gelli *et al*., 2019; Bundy *et al*., 2018) [2, 30, 6].

In Zimbabwe, SFPs are often targeted at rural and food-insecure communities, where learners face chronic undernutrition and limited educational resources (Ndava *et al*., 2021) [38]. Empirical studies demonstrate that SFPs produce measurable educational benefits. Aurino *et al*. (2018) found that children receiving school meals had significantly higher literacy and numeracy scores (Aurino *et al*., 2018) [2]. Gelli *et al*. (2019) reported that feeding programmes in Ghana and Kenya increased attendance and reduced dropout rates, while Bundy *et al*. (2018) highlighted improved classroom engagement and concentration (Gelli *et al*., 2019; Bundy *et al*., 2018) [30, 6].

School feeding programs (SFPs) extend their impact beyond immediate educational outcomes, contributing significantly to broader developmental goals, such as poverty reduction, food security, and community development (Drake *et al*., 2017; Gelli *et al*., 2016) [19, 21]. Table 1 presents recent empirical findings on the influence of SFPs on learning outcomes in Zimbabwe and the broader Sub-Saharan Africa region from 2015 to 2025. In Zimbabwe, while SFPs have been shown to enhance student attendance and classroom engagement, they alone are insufficient to address learning disparities without the support of additional interventions, such as remedial education or teacher capacity building (Ndava *et al*., 2021; Mpofu & Mafa, 2019) [38, 35].

Looking beyond Zimbabwe, both longitudinal and cross-sectional research across sub-Saharan Africa, school feeding programmes (SFPs) have consistently demonstrated positive effects on student attendance, engagement, and retention, particularly among children from food-insecure households, although improvements in learning outcomes are more variable. In Zambia, school feeding programmes (SFPs) that reach over 4.6 million students have led to more consistent attendance and greater parental involvement, although academic improvements rely on additional instructional support (Lusaka Times, 2025; Kamange *et al* 2025; University of Zambia, 2022) [29, 28, 58]. Similarly, in Botswana, SFPs in both primary and secondary schools have boosted attendance, enrolment, and student focus; however, specific academic achievements remain modest (Daily News, 2023; ResearchGate, 2017) [14, 47].

In Shinyanga, Tanzania, targeted initiatives have increased student engagement and exam performance following the intervention (Mketo *et al*., 2022) [32], while in Chikwawa, Malawi, students in SFPs scored higher on learning tests than those in non-feeding schools, although some tasks showed only slight differences (Chavula & Matafwali, 2025) [8]. These results underscore that while SFPs effectively enhance school participation and nutritional status, a comprehensive improvement in learning outcomes requires integrated strategies that combine nutrition with remedial education or teaching support. These collective findings underscore that, while SFPs are a robust nutrition-sensitive intervention, their full potential is realized when they are integrated with complementary educational strategies, such as remedial teaching, professional development for teachers, and the provision of adequate learning resources.

3.5. Structural Drivers of Zero Pass Rates in Zimbabwe

Zimbabwe, educational outcomes are shaped by a complex interaction of socioeconomic, institutional, and environmental factors that collectively influence learners' acquisition of foundational literacy and numeracy skills. A major constraint is the persistence of poverty and household food insecurity, particularly in rural and marginalized communities (Ndava *et al*., 2021) [38]. Limited household income restricts access to adequate nutrition, educational materials, and supportive home learning environments. Consequently, children from food-insecure households often attend school without sufficient nourishment, which adversely affects concentration, memory retention, and overall cognitive functioning. These conditions contribute to irregular attendance, reduced classroom engagement, and ultimately weaker academic performance (Moyo, 2019) [33]. In such contexts, parental capacity to provide academic support may also be constrained by economic pressures, workload, and limited educational attainment, further compounding learners' challenges.

Institutional constraints within the education system further undermine learning outcomes. Many schools—especially in rural areas—face acute shortages of textbooks, teaching aids, and basic infrastructure. Such resource limitations restrict opportunities for learners to practice core skills in reading, writing, and numeracy, thereby impeding the development of foundational competencies (Mutekwe, 2017) [36]. In addition, teacher shortages and gaps in professional capacity remain significant concerns. High pupil–teacher ratios limit individualized instruction and reduce teachers' ability to identify and support struggling learners. In some cases, insufficient training in contemporary pedagogical methods, including differentiated instruction and remedial teaching, further weakens instructional quality (Mpofu & Mafa, 2019) [35].

Geographical and social factors intensify these constraints. In many rural communities, learners must travel long distances to attend school, often resulting in fatigue, lateness, and increased absenteeism, particularly during adverse weather conditions. These challenges are frequently more pronounced for girls, who may also shoulder substantial household responsibilities, including caregiving and domestic tasks (Chikoko, 2016) [10]. Such demands reduce study time and limit consistent participation in schooling.

The convergence of poverty, inadequate school resources, limited teacher capacity, and geographical barriers generates cumulative learning deficits over time. These deficits are strongly associated with persistent underperformance and the emergence of zero-pass-rate schools in national examinations. Addressing these challenges requires a coordinated, multi-sectoral response. Interventions that integrate school nutrition programmes, improved access to learning materials, strengthened teacher professional development, and enhanced community and household support systems are more likely to produce sustained improvements in learning outcomes. Such a holistic approach is essential for creating enabling learning environments and improving academic achievement in Zimbabwean primary schools (Ndava *et al*., 2021; Moyo, 2019; Mutekwe, 2017; Mpofu & Mafa, 2019; Chikoko, 2016) [38, 33, 36, 35, 10].

3.6. Integrated Nutrition and Academic Recovery Strategies

Evidence increasingly demonstrates that single-sector interventions—such as school feeding programmes implemented in isolation—are often insufficient to generate sustained improvements in academic performance. While feeding initiatives effectively address short-term hunger and can improve school attendance and classroom attentiveness, their long-term educational impact is limited when underlying pedagogical and structural challenges remain unresolved. Research across multiple developing countries indicates that learners may benefit nutritionally from school meals yet still struggle academically due to persistent learning gaps, inadequate teaching support, and limited educational resources.

Table 2: Integrated Interventions & Academic Recovery

Study	Country	Design	Intervention Components	Outcome Measures	Effectiveness
Aurino *et al*., 2019	Ghana	Cluster-RCT	Feeding + remedial learning	Literacy & numeracy	Large gains in exam performance
Bundy *et al*., 2018	Multi-country	Review	Feeding + teacher training	Attendance, cognition	Strong evidence for attendance & cognitive improvements
Gelli *et al*., 2016	Ghana	Quasi-experimental	Feeding + community engagement	Enrolment & learning outcomes	Moderate improvement in attendance & engagement
Ndava *et al*., 2021	Zimbabwe	Survey	Feeding + academic mentoring	Grade 7 performance	Combined interventions improved pass rates
Moyo, 2019	Zimbabwe	Observational	Feeding + resource provision	Learning outcomes	Multi-component interventions reduce zero pass rates

Scholars and development practitioners have increasingly emphasized the importance of integrated, multisectoral strategies that combine nutritional support with targeted educational interventions to address the broader determinants of learning outcomes (Bundy *et al*., 2018; Gelli *et al*., 2016; Aurino *et al*., 2019) [6, 21, 2]. A growing body of empirical studies supports the effectiveness of these integrated approaches. For example, a cluster randomized controlled trial conducted by Aurino *et al*. (2019) in Ghana demonstrated that combining school feeding with structured remedial learning programmes produced substantial improvements in literacy and numeracy performance compared to feeding programmes alone (Aurino *et al*., 2019) [2]. Similarly, Bundy *et al*. (2018) reviewed evidence from multiple countries and concluded that programmes integrating school meals with teacher training and improved instructional practices significantly enhanced school attendance, cognitive engagement, and overall learning outcomes (Bundy *et al*., 2018) [6]. Complementary findings from Gelli *et al*. (2016) further show that interventions incorporating community engagement mechanisms—such as parental participation in school activities and local support

for programme implementation—can improve enrolment, strengthen learner motivation, and create more supportive educational environments (Gelli *et al*., 2016) [21]. These studies collectively illustrate that integrated education and nutrition strategies are more effective because they simultaneously address both immediate learner needs and systemic educational barriers.

Evidence from Zimbabwe reinforces these broader regional findings. Studies indicate that multi-component programmes combining school feeding with academic mentoring, resource provision, and teacher support can significantly improve Grade 7 examination outcomes and reduce the prevalence of zero pass rate schools (Ndava *et al*., 2021; Moyo, 2019) [38, 33]. Effective integrated interventions typically include school feeding programmes that enhance nutrition and cognitive readiness, remedial education initiatives designed to close literacy and numeracy gaps, teacher training programmes that strengthen instructional quality, and community engagement strategies that encourage parental support for learning at home.

When implemented together, these complementary interventions create a more enabling learning environment in which children are not only physically prepared to learn but also supported academically and socially. As a result, multi-component programmes implemented across Zimbabwe and other Sub-Saharan African contexts consistently demonstrate measurable improvements in school attendance, learner engagement, and academic performance, highlighting the critical importance of holistic education recovery strategies (Ndava *et al*., 2021; Bundy *et al*., 2018; Aurino *et al*., 2019; Moyo, 2019; Gelli *et al*., 2016) [38, 6, 2, 33, 21]. Table 2 presents examples of **integrated interventions and academic recovery strategies implemented in various countries, including Zimbabwe, highlighting their design, key components, and observed impacts on learning outcomes.**

3.7. Limitations of Nutrition-Only Interventions

School feeding programs (SFPs) are widely acknowledged for their ability to boost school attendance and enhance short-term cognitive engagement among students. However, evidence indicates that their effects on long-term academic success are limited when these programs are implemented in isolation. By alleviating immediate hunger and enhancing students' readiness to engage in classroom activities, SFPs play a crucial role in increasing school enrollment, reducing absenteeism, and improving attentiveness during lessons. Nevertheless, better attendance and classroom presence do not necessarily lead to improved academic performance, especially in environments where broader educational challenges persist.

Research conducted in Zimbabwe has shown that students in schools with well-established feeding programs may still perform poorly in Grade 7 national exams if essential pedagogical and institutional issues are not addressed (Ndava *et al*., 2021; Mpofu & Mafa, 2019) [38, 35]. This situation highlights the broader reality that educational outcomes are influenced by a complex interplay of factors beyond nutrition. Teacher quality is a critical factor in student achievement, as effective teaching, subject expertise, and pedagogical skills are vital for converting classroom attendance into meaningful learning outcomes.

In many rural and under-resourced schools in Zimbabwe, high student–teacher ratios, teacher shortages, and limited professional development opportunities undermine instructional quality and diminish the effectiveness of teaching and learning processes. Without sufficient teacher capacity and support, even well-nourished students may struggle to acquire the foundational literacy and numeracy skills needed for success in national exams. Access to adequate learning resources is another key factor affecting educational outcomes. Many schools, particularly in rural areas, operate with insufficient textbooks, teaching aids, laboratory equipment, and digital learning resources. This scarcity limits students' opportunities to practice, reinforce, and apply the knowledge gained during classroom instruction. Similarly, the physical and psychosocial classroom environment significantly influences student engagement and performance.

Overcrowded classrooms, inadequate infrastructure, and poorly maintained facilities can reduce student concentration and limit teachers' ability to provide individualized support to struggling students. Beyond the school environment, parental and community support plays a significant role in students' academic performance. Households facing chronic poverty and food insecurity may find it challenging to provide a supportive learning environment at home, including supervision of homework, provision of study materials, and encouragement of regular school attendance. In some rural communities, children—especially girls—may also be required to participate in household labor, caregiving duties, or income-generating activities, which reduces the time available for studying and academic preparation. Consequently, the lack of strong school–community partnerships can undermine the potential benefits of school-based interventions, such as feeding programs.

These findings emphasize the necessity of implementing nutrition-sensitive, multifaceted academic recovery strategies that concurrently address nutritional, educational, and structural challenges to learning. Programs that merge school meal initiatives with teacher training, remedial education programs, improved access to educational resources, and community engagement efforts have shown greater potential to enhance both learning outcomes and exam performance. Such strategies acknowledge that while addressing hunger is crucial, it is insufficient on its own for academic success. Instead, enduring improvements in educational outcomes require coordinated actions that enhance both student well-being and the broader educational framework in which learning occurs (Aurino *et al*., 2019; Gelli *et al*., 2019) [2, 21].

3.8. Learning Poverty in Primary Education

Learning poverty—defined as the inability of children to read and understand a simple text by the age of ten—remains a major global development challenge and a critical indicator of the quality of basic education systems. Despite considerable progress in expanding access to primary education worldwide, many developing countries continue to struggle with low learning outcomes and high rates of school failure, particularly among children in rural and socio-economically disadvantaged communities. This phenomenon forms part of what has been widely described as the global learning crisis, where a substantial proportion of children complete primary school without acquiring foundational literacy and numeracy skills (World Bank, 2019; UNESCO, 2022) [61, 57]. In Zimbabwe, similar patterns are evident, with marginalized rural schools experiencing persistent academic underperformance and, in some cases, zero pass rates in

national examinations. These outcomes reflect systemic challenges that extend beyond access to schooling and highlight deeper structural inequalities within the education system (UNICEF, 2021) [56].

A growing body of evidence indicates that poverty and nutritional deprivation are among the most influential factors contributing to poor educational outcomes. Children from food-insecure households often attend school hungry, which significantly affects their cognitive functioning, attention span, and ability to engage effectively in classroom learning. Chronic undernutrition and micronutrient deficiencies impair brain development and reduce learners' capacity to concentrate, process information, and retain knowledge, ultimately weakening academic performance (Aurino *et al*., 2018; Bundy *et al*., 2018) [2, 6].

Empirical studies have shown that nutritional deficiencies among primary school learners are closely associated with lower academic achievement, higher absenteeism, and increased risk of examination failure (Chinyoka, 2014; Ndava *et al*., 2021) [13, 38]. These interlinked challenges demonstrate how poverty and food insecurity contribute to the persistence of learning poverty and the emergence of zero pass rate schools.

School feeding programmes therefore play an important role as social protection and education support mechanisms designed to address both hunger and barriers to learning. By providing regular meals, these programmes improve school attendance, enhance learners' concentration in class, and create conditions that support cognitive development and academic engagement. Evidence from several Sub-Saharan African countries indicates that school feeding initiatives can improve participation in education and learning readiness, particularly when combined with complementary educational interventions (Drake *et al*., 2017; Gelli *et al*., 2019) [19, 21]. However, sustainable improvements in academic outcomes require integrated strategies that extend beyond nutrition support alone.

Combining school feeding with remedial instruction, teacher capacity development, improved access to learning materials, and stronger parental and community engagement can significantly enhance literacy and numeracy acquisition and reduce the incidence of zero pass rates. Such multi-dimensional approaches align with the objectives of Sustainable Development Goal 4, which emphasizes inclusive and equitable quality education for all learners (UNESCO, 2022) [57].

3.9. Policy Implications

The evidence synthesized in this review highlights the necessity for comprehensive, multi-sectoral policy interventions to address zero-pass rates and improve primary education outcomes in Zimbabwe. Expanding school feeding programs should be a central priority, particularly in regions experiencing high levels of food insecurity and poor examination performance. These programs are most effective when they incorporate locally sourced foods, which not only enhance student nutrition but also support community agriculture, local economies, and sustainability (Gelli *et al*., 2016; Aurino *et al*., 2018) [21, 2]. However, nutritional interventions alone are insufficient to address the complex determinants of poor academic outcomes. Integrating school meals with academic support initiatives, such as remedial education and after-school tutoring, is critical for simultaneously addressing learning gaps and educational deficits.

Evidence indicates that combined interventions significantly enhance literacy, numeracy, and examination performance compared to single-sector programs (Snilstveit *et al*., 2016) [51]. Strengthening teacher capacity is another vital policy lever. Professional development in remedial pedagogy, child-teaching approaches, and assessment techniques equips educators to better support learners who struggle academically. Encouraging continuous in-service training is particularly important in under-resourced schools, where teacher shortages and large class sizes often hinder effective instruction (Mpofu & Mafa, 2019) [35].

Improving monitoring and evaluation systems is essential. Establishing robust mechanisms to track attendance, nutrition, and learning outcomes, and using real-time data to guide resource allocation and intervention targeting, can enhance the responsiveness and effectiveness of education programs (World Bank, 2019; UNESCO, 2022) [61, 57]. Finally, promoting community participation strengthens the sustainability and impact of interventions. Engaging parents, local NGOs, and community organizations in school nutrition programs, academic mentoring, and resource mobilization reinforces positive learning behaviours at home, enhances accountability, and positions schools as hubs for broader social and educational development (Masset *et al*., 2018; Gelli *et al*., 2019) [30, 21].

In summary, evidence from Zimbabwe and comparable Sub-Saharan African contexts indicates that eliminating zero-pass rates requires integrated strategies linking health, nutrition, pedagogy, and social support. Policy reforms must go beyond providing meals alone; they must concurrently strengthen teacher effectiveness, remedial learning, and community engagement. Such a holistic, multisectoral approach not only addresses immediate educational deficits but also fosters sustainable improvements in learning outcomes and long-term human capital development.

3.10. Research Gaps and Future Directions

Despite the growing body of evidence highlighting the positive effects of nutrition-sensitive school interventions on attendance and overall academic performance, significant research gaps remain in fully understanding their impact on learning outcomes. Most existing studies in sub-Saharan Africa, including those in Zimbabwe, have primarily focused on short-term indicators like attendance, retention, and overall exam pass rates, with insufficient attention to subject-specific competencies such as literacy, numeracy, and higher-order cognitive skills. Moreover, there is a notable absence of longitudinal research tracking students over multiple academic years to assess the sustained effects of nutritional interventions on cognitive development, academic resilience, and overall learning trajectories.

Future research should prioritize integrated study designs that include detailed nutritional assessments (e.g., macronutrient and micronutrient intake) alongside subject-specific performance metrics, such as comprehension, problem-solving, and critical thinking skills. Such studies would provide detailed evidence on how nutritional improvements interact with pedagogical quality, instructional strategies, and socioeconomic contexts to influence learning outcomes.

Additionally, comparative cross-district and cross-country studies are necessary to evaluate the effectiveness of various models of nutrition-sensitive interventions, including school feeding programs, micronutrient supplementation, and community-based support mechanisms. Addressing these gaps will enhance the evidence base for policy and practice and inform the design of targeted interventions capable of reducing zero-pass rates and promoting equitable educational achievement.

4. Conclusion

Zero Pass Rates in Grade 7 primary school examinations signify more than isolated academic failures; they reflect broader structural, socioeconomic, and pedagogical challenges within Zimbabwe's education system. This systematic review reveals that child nutrition is a crucial determinant of learning outcomes, with undernutrition and food insecurity directly impairing concentration, cognitive function, and classroom engagement. School feeding programs have consistently demonstrated improvements in attendance, participation, and basic learning performance, highlighting their value as a nutrition-sensitive social protection mechanism. However, evidence suggests that nutrition interventions alone are insufficient to address systemic learning deficits. Persistent zero pass rates are associated with compounding factors such as inadequate teaching capacity, limited learning resources, large class sizes, and minimal parental or community support. Addressing these challenges necessitates integrated academic recovery interventions that combine school feeding with remedial teaching, teacher professional development, learning materials provision, and active community engagement.

To sustainably eliminate zero-pass rates, policymakers in Zimbabwe must adopt multi-sectoral strategies that link education, health, and social protection systems. Holistic interventions not only address immediate barriers to learning but also contribute to equitable access to quality education, improved human capital development, and long-term social and economic resilience. Future research should continue to evaluate the effectiveness of integrated, context-specific interventions, particularly in rural and economically marginalized communities, to ensure that all children can succeed academically. In summary, nutrition-sensitive academic recovery initiatives, when embedded within comprehensive education strategies, provide a practical and evidence-based pathway toward eradicating zero pass rates and promoting sustainable learning outcomes for Zimbabwean primary school children.

4.2. Implications for Policy and Practice:

1. **Persistent Academic Underachievement**: Despite investments in primary education, zero pass rates remain a significant challenge in Grade 7, reflecting systemic structural, nutritional, and pedagogical barriers.
2. **Structural Drivers Matter:** Poverty, household food insecurity, inadequate learning resources, and limited teacher capacity are key determinants of poor academic performance.
3. **Nutrition as a Cognitive Lever:** Malnutrition and micronutrient deficiencies negatively affect attention, memory, and problem-solving, directly influencing learning outcomes.
4. **School Feeding Programmes (SFPs) Are Effective but Not Sufficient**: Evidence from Zimbabwe, Zambia, Botswana, and Tanzania shows that SFPs improve attendance, engagement, and some learning metrics, but academic gains are maximized when combined with remedial teaching and pedagogical support.
5. **Integrated Recovery Interventions Work Best**: Nutrition-sensitive academic recovery programmes—combining targeted feeding, remedial lessons, and community engagement—demonstrate the strongest potential to reduce zero pass rates and improve learning outcomes.
6. **Policy Implication:** Addressing zero pass rates requires multi-dimensional strategies that simultaneously tackle structural inequities, nutrition, and educational quality.
7. **Research Gap:** Further longitudinal and subject-specific studies are needed to measure the full impact of nutrition-sensitive interventions on literacy, numeracy, and higher-order cognitive skills.

4.3. Data Availability Statement: No new data were generated or analysed in this study.

4.4. Ethics Statement: This study did not involve human participants or animals, and therefore ethical approval was not required.

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