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Mines and Minds: The Academic and Psychosocial Toll of Mining on Secondary Students in Hwange District

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Abstract*—Mining activities have long shaped the socio-economic landscape of Hwange District, yet their implications for the academic and psycho-social wellbeing of secondary school students remain underexplored. This qualitative study investigates how proximity to mining operations influences learners' educational performance, emotional health, and social development. Guided by an interpretivist paradigm, data were collected through in-depth interviews, focus group discussions, and participant observations involving students, teachers, and parents from selected secondary schools. The findings reveal that while mining contributes to household incomes, it simultaneously generates school absenteeism, child labour, environmental stressors, family instability, and psychological distress among learners. Participants reported fatigue, anxiety, reduced concentration, and diminished academic motivation linked to mining-related responsibilities and community dynamics. The study concludes that mining exerts a complex dual impact, i.e. economic benefit alongside significant academic and psycho-social costs necessitating integrated interventions by schools, policymakers, and community stakeholders to safeguard learners' wellbeing and educational attainment.*

***Keywords*—** *Academic Performance, Hwange District, Mining, Psycho-social Wellbeing, Secondary School Students*.

I. Introduction

Mining remains one of the most significant economic activities in Zimbabwe, particularly in Hwange District, which is widely known for its extensive coal reserves and large-scale extraction operations led by companies such as Hwange Colliery Company Limited. While mining contributes substantially to national revenue, employment creation, and infrastructural development, its social and environmental consequences have increasingly drawn scholarly attention. Communities located near mining operations often experience environmental degradation, population influx, labour migration, and shifting family dynamics. However, limited research has examined how these structural changes affect the academic trajectories and psycho-social wellbeing of secondary school students living in such environments.

Adolescence represents a critical developmental stage characterized by cognitive growth, identity formation, and emotional vulnerability. Exposure to socio-economic instability, hazardous labour practices, and community disruptions may significantly influence learners' school attendance, concentration, academic motivation, and mental health. In mining communities, young people may be drawn into income-generating activities, experience parental absence due to shift work, or confront environmental stressors such as pollution and noise. These factors may undermine educational outcomes and psychological resilience, yet they remain insufficiently documented within the Zimbabwean context.

The rationale for this study stems from the need to bridge this knowledge gap by exploring the lived experiences of secondary school students in Hwange District. Understanding how mining environments shape academic performance and psycho-social wellbeing is essential for informing policy, school-based interventions, and community support systems. By adopting a qualitative design, the study seeks to capture in-depth perspectives of students, teachers, and parents, thereby generating context-specific insights that can guide educational planning and child protection efforts in mining-affected communities.

Background to the Study

Mining has long been a catalyst for economic growth and industrial development. Extractive industries significantly contribute to Gross Domestic Product (GDP), employment, and infrastructure (World Bank, 2020). However, they also produce complex social, environmental, and psychological consequences for surrounding communities (Hilson, 2012; Bebbington et al., 2018). While macroeconomic benefits are well documented, micro-level impacts particularly on school-going adolescents remain underexplored. In countries like Ghana, South Africa, and Zambia, mining communities often face environmental degradation, social dislocation, family strain, and child labour, disrupting education and wellbeing (Hilson & Osei, 2014; Mushati et al., 2019).

In Sub-Saharan Africa, mining zones are characterized by rapid urbanization, migration, income inequalities, and shifting family structures. Children in these communities are at higher risk of dropout, absenteeism, and psychosocial distress due to economic pressures and hazardous work (ILO, 2021). Environmental stressors such as pollution, noise, and land degradation also affect health and cognitive outcomes (Landrigan et al., 2018). Parental engagement in shift-based mining work can weaken supervision and emotional support critical to adolescent development (Evans, 2010). Thus, while mining stimulates economic activity, it can undermine educational stability and psychosocial security.

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In Zimbabwe, mining is central to the national economy, contributing to export earnings and local livelihoods (Chigumira, 2019). Districts rich in coal, gold, and other minerals face intensified extraction and associated socio-economic disparities, environmental degradation, and limited social services (Mawowa, 2013; Moyo, 2017). Hwange District, with its vast coal reserves managed by Hwange Colliery Company Limited, exemplifies this dual reality: households gain income, but students face school disruptions, domestic responsibilities, and psychosocial stressors.

Adolescence is a critical developmental stage with heightened emotional sensitivity and academic transitions (Santrock, 2018). Exposure to socio-economic instability can affect concentration, motivation, self-esteem, and educational outcomes (Bronfenbrenner, 1979). Ecological systems theory suggests that environmental changes from mining affect development through family, school, and community interactions. However, little qualitative research captures learners' experiences in Hwange.

This study situates itself within the global and regional discourse on extractive industries and community wellbeing, focusing on the lived academic and psycho-social realities of Hwange secondary students. Using a qualitative approach, it foregrounds learner, teacher, and parent perspectives to inform child-centred policies, psychosocial interventions, and sustainable community development.

Purpose of the Study

The purpose of this qualitative study is to explore the academic and psychosocial effects of mining activities on secondary school students in Hwange District. It examines how living in a mining-dominated environment influences learners' educational experiences, academic performance, emotional wellbeing, social relationships, and future aspirations.

The study seeks to generate in-depth insights into students' lived experiences by capturing the perspectives of students, teachers, and parents on how mining-related economic activities, environmental conditions, and family dynamics affect schooling. It also highlights both the perceived benefits, such as improved household income, and the challenges, including absenteeism, psychological stress, and reduced academic motivation.

Ultimately, the study aims to provide context-specific evidence to inform educational policy, school-based psychosocial interventions, and community development strategies.

Research Objectives

The study is guided by the following objectives:

1. To explore how mining activities influence the academic performance of secondary school students in Hwange District.
2. To examine the psycho-social experiences of students living in mining-affected communities.
3. To identify environmental, familial, and socio-economic factors associated with mining that affect learners' schooling.
4. To assess the perceived benefits and challenges of mining on students' educational aspirations and motivation.
5. To generate context-specific recommendations for schools, policymakers, and community stakeholders to support students' academic and psycho-social wellbeing.

Research Questions

The study seeks to answer the following research questions:

1. How do mining activities affect the academic performance of secondary school students in Hwange District?
2. What psycho-social challenges do students in mining communities experience?
3. In what ways do family dynamics and socio-economic conditions linked to mining shape learners' school attendance and engagement?
4. How do students perceive the benefits and drawbacks of living in a mining-dominated environment?
5. What interventions can be implemented to mitigate the negative academic and psycho-social effects of mining on secondary school students?

Significance of the Study

This study is significant at the theoretical, practical, policy, and community levels.

At the academic level, the research contributes to knowledge on extractive industries and community wellbeing by highlighting the educational and psychosocial experiences of adolescents. Although mining has often been studied from economic and environmental perspectives, limited attention has been given to its impact on secondary school learners in Hwange District. The study, therefore, fills an important contextual and empirical gap in Zimbabwean educational and social research.

At the policy level, the findings may inform government ministries responsible for education, youth development, and mining regulation. Evidence from students' lived experiences can support the development of child-sensitive mining policies, educational support programmes, and psychosocial service frameworks for mining-affected communities.

At the school level, the study may help school administrators, teachers, and guidance and counselling departments better understand the challenges learners face. The findings can inform targeted interventions such as academic support strategies, counselling services, and stronger school–community partnerships.

At the community level, parents, community leaders, and mining companies may gain insight into how mining activities influence adolescents' development. This may encourage corporate social responsibility initiatives that support education, mental health awareness, and youth empowerment.

Finally, the study provides a qualitative foundation for future researchers to conduct further quantitative or mixed-methods studies on the relationship between mining environments, education, and adolescent well-being.

II. Literature Review

The Theoretical Framework

This study is anchored in Urie Bronfenbrenner's Ecological Systems Theory (1979), which asserts that human development is shaped by interactions across multiple nested systems: microsystem (family, school, peers), mesosystem (interactions between microsystems), exosystem (indirect environments such as parents' workplaces), macrosystem (broader socio-economic and cultural structures), and chronosystem (changes over time). In Hwange District, mining influences these layers i.e. students' daily experiences (microsystem) are affected by parental employment and household income; school–family interactions (mesosystem) are shaped by economic and community demands; mining companies (exosystem) indirectly impact students through environmental and economic pressures; and national mining policies (macrosystem) influence local realities. Over time (chronosystem), exposure to mining cumulatively affects academic performance and psychosocial wellbeing.

The Ecological Systems Theory is suitable for this study because it addresses multidimensional factors affecting academic and psycho-social outcomes. It aligns well with the qualitative design by emphasizing context and lived experiences and captures mining as a structural force operating across family, school, community, and policy domains. This framework provides a holistic, context-sensitive lens to examine how mining shapes learners' educational and emotional realities (Bronfenbrenner, 1979).

Mining and Academic Performance

Globally, mining communities have been associated with mixed educational outcomes. While extractive industries can stimulate local economies and improve infrastructure, research shows that they often contribute to educational disruptions among school-aged children (Bebbington et al., 2018). In Latin America and parts of Asia, children in mining zones have reported high absenteeism, fatigue, and limited time for study due to household labour demands (World Bank, 2020).

In Sub-Saharan Africa, studies in Ghana and Zambia indicate that mining economies can incentivize early entry into labour markets, particularly among boys, thereby increasing dropout rates and weakening academic commitment (Hilson & Osei, 2014). The International Labour Organization (2021) notes that mining-related child labour remains a significant barrier to consistent school attendance across several African countries.

In Zimbabwe, scholars highlight that mining districts often experience fluctuating school attendance linked to household economic pressures and informal mining activities (Mawowa, 2013). Although mining income may support school fees, the long-term academic engagement of learners may be compromised by work demands and unstable community environments. In Hwange District, where coal mining dominates economic life, anecdotal evidence suggests that learners sometimes juggle schooling with mining-related responsibilities, potentially undermining performance. However, empirical qualitative studies focusing specifically on secondary students' academic experiences remain limited, creating a research gap this study seeks to address.

Psycho-social Experiences of Students in Mining Communities

Globally, mining operations are linked to environmental stressors such as pollution, noise, displacement, and community conflict, which can affect psychological wellbeing (Landrigan et al., 2018). Adolescents exposed to unstable socio-economic environments are at heightened risk of anxiety, low self-esteem, and emotional distress (Santrock, 2018).

Across Africa, mining towns often experience rapid migration, social fragmentation, and increased substance abuse, factors associated with psycho-social vulnerability among youth (Hilson, 2012). Research in South Africa's mining communities reveals elevated levels of family strain and reduced parental supervision due to shift work and labour migration (Campbell, 2013).

In Zimbabwe, mining regions have been associated with socio-economic disparities, informal settlements, and family disruptions (Moyo, 2017). While much literature focuses on adult labour conditions, limited attention has been paid to adolescents' emotional and social wellbeing. In Hwange District, the presence of large-scale mining operations may expose learners to environmental pollution, unstable family routines, and peer influences shaped by mining culture. Yet, there is scant qualitative research capturing students' own narratives regarding these psycho-social experiences.

Family Dynamics and Socio-economic Conditions Linked to Mining

At a global level, extractive industries significantly reshape family systems. Parental employment in shift-based or migratory labour patterns often alters caregiving arrangements and parent–child relationships (Evans, 2010). According to ecological perspectives, such disruptions in the family microsystem can directly influence children's developmental and educational outcomes (Bronfenbrenner, 1979).

In African mining regions, economic opportunities may improve household income while simultaneously increasing domestic responsibilities for adolescents (ILO, 2021). Studies in Ghana and the Democratic Republic of Congo reveal that children frequently assume caregiving or income-generating roles when parents are engaged in mining activities (Hilson & Osei, 2014).

In Zimbabwe, fluctuating mining incomes and informal extraction practices contribute to economic uncertainty in households (Chigumira, 2019). Such instability may affect students' access to learning materials, school fees, and emotional support. In Hwange District, where families often depend directly or indirectly on coal mining, learners may experience both economic benefits and socio-emotional strain. However, systematic research exploring how these family and socio-economic dynamics influence school engagement is minimal.

Perceived Benefits and Drawbacks of Living in a Mining-Dominated Environment

Globally, mining can enhance infrastructure, create employment, and stimulate local markets (World Bank, 2020). Communities often benefit from improved roads, electricity, and corporate social responsibility initiatives targeting schools and health services.

In Sub-Saharan Africa, however, scholars argue that such benefits are frequently unevenly distributed, leading to inequality and social tension (Bebbington et al., 2018). While some households may experience economic upliftment, others remain marginalized, perpetuating cycles of vulnerability among youth.

In Zimbabwe, mining companies have contributed to community development initiatives, yet concerns remain regarding environmental degradation and social instability (Moyo, 2017). In Hwange District, coal mining operations have historically supported employment and local services, but they have also raised concerns about pollution, displacement, and socio-economic disparities. There is limited research examining how secondary school students themselves perceive these dual realities—whether they view mining primarily as an opportunity, a challenge, or both

Interventions to Mitigate Academic and Psycho-social Effects

Internationally, integrated interventions combining educational support, psychosocial services, and community engagement have shown promise in vulnerable contexts (UNESCO, 2019). School-based counselling programmes and youth mentorship initiatives can strengthen resilience among adolescents facing socio-economic stressors.

In African mining communities, partnerships between schools, governments, and mining companies have been recommended to enhance youth development outcomes (Hilson, 2012). Such collaborations often include scholarship schemes, after-school programmes, and mental health support services.

In Zimbabwe, guidance and counselling programmes are embedded within the education system, yet resource constraints limit their effectiveness in high-need communities (Moyo, 2017). For Hwange District, context-specific, evidence-based interventions remain underdeveloped due to limited localized research.

Synthesis and Identified Gap

The reviewed literature demonstrates that mining exerts multidimensional academic and psycho-social effects on adolescents globally and regionally. However, most studies emphasize economic or environmental dimensions, with limited qualitative exploration of secondary school students' lived experiences in Zimbabwean mining districts. Specifically, there is a paucity of research centered on Hwange District.

Therefore, this study seeks to bridge this gap by providing an in-depth qualitative examination of how mining shapes the academic engagement, emotional wellbeing, and social realities of secondary school learners within this context.

III. Methodology

Philosophical Framework

This study is grounded in the interpretivist paradigm, which assumes that reality is socially constructed and that meaning is derived from individuals' lived experiences and interactions within their social contexts (Creswell & Poth, 2018). Interpretivism rejects the notion of a single objective reality and instead emphasizes multiple realities shaped by cultural, social, and environmental influences.

The choice of interpretivism is justified because the study seeks to understand how secondary school students in Hwange District perceive and interpret the academic and psycho-social effects of mining within their communities. The research does not aim to measure variables statistically but to capture subjective experiences, emotions, and meanings attached to living in a mining-dominated environment. Since the study is anchored in Urie Bronfenbrenner's Ecological Systems Theory, which emphasizes contextual and relational influences on development, interpretivism provides a philosophically coherent foundation for exploring these complex, layered realities.

Research Design

The study adopts a qualitative research design, specifically a phenomenological approach. Phenomenology focuses on exploring and describing participants' lived experiences regarding a particular phenomenon (Moustakas, 1994).

This design is appropriate because the study seeks to understand how students experience and make sense of the academic and psycho-social toll of mining in their daily lives. A qualitative approach allows for in-depth exploration of feelings, perceptions, challenges, and coping mechanisms that cannot be adequately captured through quantitative methods. It also enables the researcher to probe emerging themes and contextual nuances unique to Hwange District.

Population, Sample, and Data Collection Instruments

The target population for this study consists of secondary school students (Forms 1–6) in selected schools in Hwange District, their teachers (particularly those involved in guidance and counselling), and parents or guardians. These groups were purposively selected because they are directly or indirectly affected by mining activities and can provide multi-perspective insights into the academic and psychosocial experiences of learners in mining communities.

A purposive sampling technique was used to select forty participants with direct experience of the phenomenon under investigation. This method is appropriate in qualitative research because it allows the researcher to select information-rich cases capable of providing detailed and meaningful data (Patton, 2015). The sample comprised approximately 20 students from mining-affected communities, 10 teachers, and 10 parents or guardians. Selection criteria included proximity to mining operations, length of residence in the community, and willingness to participate. This approach ensured the collection of in-depth, context-specific information rather than statistical generalization.

Data were collected using multiple qualitative instruments to enable triangulation. Semi-structured interviews were conducted with students, teachers, and parents to explore participants' experiences while aligning with the research

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objectives. Focus group discussions (FGDs) were held with students to encourage interaction and shared reflection on experiences related to mining and schooling. In addition, participant observation was used to capture non-verbal cues and environmental factors such as noise, dust, and school attendance patterns within school and community settings. Together, these methods generated rich descriptive data and enhanced the credibility and trustworthiness of the study's findings.

Data Analysis

Data were analyzed using thematic analysis, following systematic coding procedures to identify patterns and emerging themes (Braun & Clarke, 2006). Transcribed interviews and focus group discussions were read repeatedly, coded inductively, and organized into categories aligned with the research objectives. This method allowed themes related to academic performance, psycho-social wellbeing, family dynamics, and perceived benefits and challenges of mining to emerge organically from participants' narratives.

Ethical Guidelines

The study adhered to established ethical principles for research involving human participants:

1. Informed Consent – Participants were fully informed about the purpose, procedures, risks, and benefits of the study. Written consent was obtained from adults, and assent was obtained from students under 18, alongside parental consent.
2. Voluntary Participation – Participation was entirely voluntary, and participants were informed of their right to withdraw at any stage without penalty.
3. Confidentiality and Anonymity – Pseudonyms were used to protect participants' identities. Data were stored securely and accessed only by the researcher.
4. Non-maleficence – The researcher ensured that discussions did not cause psychological harm. Where sensitive issues arose, participants were referred to school guidance and counselling services.
5. Permission from Authorities – Formal approval was sought from school authorities and relevant educational offices in Hwange District before data collection commenced.

IV. Findings

How mining activities are influence the academic performance of secondary school students in Hwange District

Learners:

Many learners reported that mining activities significantly interfere with their school performance. Several shared, *"Sometimes we are too tired after helping our parents at the mines, and it affects how well I can concentrate in class,"* and *"The noise from the mining trucks makes it hard to study at home in the evenings."* Others noted that mining sometimes encourages absenteeism: *"Some of my friends skip school to go to the mines to earn some money, and they end up falling behind in their studies."* Learners also expressed that the home environment is affected by mining, making concentration difficult: *"I feel distracted when my parents talk about mining problems at home; it's hard to focus on homework."* Health and environmental concerns were also mentioned: *"When we miss school because of dust storms from mining, it becomes hard to catch up with lessons,"* and *"The mining dust makes me sick sometimes, and I have to miss school, which affects my results."* Finally, learners reflected on the mixed impact of mining: *"Mining brings some money to my family, but I think it also makes us lazy with school sometimes,"* and *"Sometimes I come to school late because the roads are blocked by mining trucks, and it affects my grades."*

Teachers:

Teachers echoed these observations, emphasizing that mining-related activities negatively affect student attendance and concentration. One teacher stated, *"I notice that students from mining families often come late or are absent due to mining-related activities."* Others observed the psychological impact: *"Some learners are distracted in class because they worry about earning money or helping at mining sites,"* and *"Academic performance declines for students who are frequently involved in mining tasks outside school."*

Parents:

Parents also acknowledged the influence of mining on academic performance. Many highlighted that their children sometimes prioritize mining-related work over school: *"Mining has made my child sometimes focus more on earning money than studying."* Others expressed concern about fatigue: *"I see my child struggling with school because they are tired from working near the mines,"* and reflected on declining academic outcomes: *"The school performance is not as good as it used to be, maybe because of the mining activities around the community."*

The psycho-social experiences of students living in mining-affected communities

Learners:

Learners reported that living in mining-affected communities often affects their emotional well-being and social interactions. Many expressed feelings of stress and anxiety due to mining-related disruptions: *"I feel worried all the time because my family depends on mining, and if something goes wrong, we don't know what to do."* Others highlighted how mining impacts their social life and friendships: *"Sometimes I can't play or meet my friends because I have to help at the mines or with family problems caused by mining."* Some learners discussed the emotional burden of witnessing health and environmental hazards: *"It is scary to see people get sick from the dust, and it makes me feel sad and stressed."* Additionally, learners mentioned peer influences linked to mining: *"Some of my friends think it's better to drop out and work in the mines, and it makes me feel left out if I don't go."* Others shared coping challenges: *"I try to focus on school, but the problems at home because of mining make it hard to concentrate."*

Teachers:

Teachers noted the psychological and social challenges faced by students in mining-affected communities. One teacher explained, *"Some learners appear anxious or withdrawn in class because of family and community issues*

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related to mining." Another stated, *"Students often show signs of fatigue and irritability, which I think comes from stress at home linked to mining."*

Parents:

Parents acknowledged that mining affects their children's emotional well-being and social life. One parent reflected, *"My child sometimes seems sad and stressed because we are worried about mining income or accidents."* Others mentioned disruptions to social routines: *"They cannot spend time with friends like before because they are needed at home to help with mining problems."* A parent also expressed concern about long-term effects: *"The mining environment is harsh, and I worry it might affect how my child behaves and relates to others."*

Environmental, familial, and socio-economic factors associated with mining that affect learners' schooling

Learners:

Learners highlighted several environmental, familial, and socio-economic factors linked to mining that affect their schooling. Many mentioned the impact of mining-related environmental hazards: *"The dust from the mines makes it hard to breathe, and sometimes I get sick and miss school."* Others focused on family responsibilities: *"I have to help my parents at the mining sites, and that takes away time for homework and studying."* Socio-economic pressures were also commonly cited: *"Because my family depends on mining for money, I feel pressured to work instead of focusing on school."* Some learners reflected on transportation and infrastructure challenges: *"The roads are often blocked by mining trucks, and I end up coming late to school."* Others discussed distractions at home: *"At home, we often argue about mining money, and it makes it hard to concentrate on schoolwork."*

Teachers:

Teachers confirmed that environmental and socio-economic factors from mining influence students' schooling. One teacher noted, *"Students are frequently absent or distracted due to family* responsibilities *linked to mining."* Another remarked, *"I notice that learners from mining households often struggle with time management because they are involved in economic activities outside school."*

Parents:

Parents also recognized the role of mining in shaping educational challenges. One parent explained, *"We rely on mining income,* so *sometimes I ask my child to help, even though I know it affects their studies."* Others highlighted health and environmental concerns: *"The dust and noise from mining make it hard for my child to focus on schoolwork."* A parent further reflected on socio-economic pressures: *"Sometimes my child has to skip school to help us earn money from mining, and it affects their learning."*

The perceived benefits and challenges of mining on students' educational aspirations and motivation

Learners:

Learners shared mixed views on how mining affects their aspirations and motivation. Some acknowledged the economic benefits: *"Mining helps my family get money for school fees and uniforms, so I feel motivated to go to school."* Others, however, highlighted challenges: *"Sometimes I want to study, but I feel distracted because I have to think about helping my family with mining work."* Many expressed concern about peers dropping out: *"Some of my friends think it's better to leave school and work in the mines, and it makes me worry about my own future."* Others reflected on how mining impacts their focus: *"Even when I want to do my homework, the problems at home because of mining make it hard to concentrate."* Several learners noted that mining influences their career thinking: *"I want to finish school, but sometimes I wonder if I will just end up working in the mines like my parents."*

Teachers:

Teachers observed that mining has both motivating and demotivating effects on students. One teacher stated, *"Some students are motivated to study because mining income supports* their *school needs, but others are distracted by the mining culture and responsibilities."* Another added, *"I see learners struggling to balance schoolwork and family mining duties, which sometimes lowers their aspirations."*

Parents:

Parents acknowledged the dual impact of mining on their children's education. One parent noted, *"Mining provides money for school, but it also makes my child think about work more than* learning*."* Another expressed concern about long-term effects: *"I worry that if my child gets used to helping at the mines now, they might not aim for higher education."* A parent also highlighted motivation issues: *"Sometimes my child is less interested in school because mining seems like an easier way to earn money."*

Context-specific recommendations for schools, policymakers, and community stakeholders to support students' academic and psycho-social wellbeing

Learners:

Learners suggested several ways to support their education and wellbeing in mining-affected communities. Many emphasized the need for more structured school support: *"It would help if schools could give extra classes for students who miss lessons because of mining."* Others highlighted guidance and counseling: *"I think we need someone at school to talk to when mining problems make it hard to focus on learning."* Learners also called for community interventions: *"Maybe the community can help by* making *sure children don't have to work at the mines too much."* Several mentioned infrastructure and environmental improvements: *"It would be better if the roads were safer and the dust reduced so we can come to school on time and healthy."* Some learners reflected on motivation and incentives: *"If there were scholarships or rewards for students from mining areas, it would encourage us to study harder."*

Teachers:

Teachers recommended strategies to enhance students' academic and psycho-social wellbeing. One teacher suggested, *"Schools should organize remedial classes for learners affected by mining*-related *absenteeism."* Another emphasized counseling: *"We need trained counselors to support students dealing with mining-related stress and distractions."* Teachers also highlighted collaboration with the community:

"Partnerships with parents and local leaders can help reduce the negative impact of mining on students."

Parents:

Parents provided suggestions focusing on both school support and home management. One parent stated, *"We need guidance on balancing children's help at the mines with their schooling."* Another noted, *"Parents should work with schools to ensure children have time to study and rest."* Some parents called for policy interventions: *"The government or community leaders should make rules to protect children from too much mining work so they can focus on education."*

V. Discussion of Findings

Influence of Mining Activities on Academic Performance

The study found that mining activities negatively affect students' academic performance in Hwange District. Learners frequently *noted* fatigue from assisting family members at mining sites, reduced study time, and difficulties concentrating in class because of mining-related interruptions (e.g., *"Sometimes we are too tired after helping our parents at the mines…"*). Teachers and parents corroborated these reports, describing increased absenteeism, lateness, and diminished classroom engagement among students from mining-affected households.

These findings align with broader research linking extractive industries with educational disruptions. For example, Kabonga (2023) highlights that in mining-dependent communities, children often experience school absenteeism and distraction due to economic pressures, which undermine academic performance. Similarly, Moyo and Chikozho (2020) report that environmental hazards tied to mining (such as noise and dust) can interfere with students' ability to focus, resulting in fragmented attendance and reduced learning outcomes.

Evidence from other African contexts reinforces this pattern. In Ghana's Amansie West District, studies found that child involvement in small-scale and illegal mining led to irregular attendance and decreased classroom concentration, significantly impacting academic achievement (Darko, 2018). Research in Nigeria similarly demonstrated an association between mining labour and diminished school performance, where students engaged in mining tasks experienced fatigue and lower grades (Ajayi & Fadeyi, 2019).

Moreover, global reports on child labour in extractive contexts reveal that work obligations frequently reduce time for homework and class participation, increasing the likelihood of school dropout (Human Rights Watch, 2015). These global patterns resonate with learners' experiences in Hwange, where economic pressures from mining obligations contribute to educational disengagement.

Environmental impacts of mining also pose risks to academic performance. Studies on environmental health show that exposure to mining-related pollution, including dust, can impair respiratory health and cognitive functioning, further hindering school attendance and performance (Reddy et al., 2022). Although existing research primarily examines extreme environmental events, the principle that environmental stressors negatively affect students' physical wellbeing and cognitive engagement supports learners' concerns about dust and school disruption.

In the Zimbabwean context specifically, research on artisanal and small-scale mining has linked adolescent involvement in mining activities to behavioural challenges and poorer academic outcomes, reinforcing the notion that mining can have persistent negative effects on schooling (Makhaza & Chikuvire, 2021).

Overall, the current study's findings are consistent with an established body of literature that positions mining activities as undermining student academic performance through economic demands on children's time, environmental stressors, and social pressures within mining-affected communities.

The psycho-social experiences of students living in mining-affected communities

The present study found that students living in mining-affected communities experience a range of psycho-social challenges. Learners described feelings of stress, worry, and emotional burden linked to mining-related disruptions in everyday life, as evidenced by comments such as *"I feel worried all the time because my family depends on mining…"* and *"It is scary to see people get sick from the dust, and it makes me feel sad and stressed."* Teachers observed signs of anxiety, withdrawal, and irritability, while parents acknowledged the emotional strain associated with economic instability and environmental hazards.

These findings align with existing research showing that mining activities can influence not only physical wellbeing but also psychological and emotional wellbeing**.** In Zimbabwe, mining-related environmental degradation has been shown to generate significant emotional distress among affected communities, a concept captured as *solastalgia*—the emotional suffering caused by environmental change experienced while still residing in the affected environment (Pulver, 2024). Participants in such studies reported sadness, loss, anxiety, and disconnection due to the transformation of their home environments by mining operations, reflecting the emotional impact on mental wellbeing.

The psycho-social challenges seen in this study are consistent with this framework: learners described stress and loss of focus at school due to fears about mining sustainability and their families' futures, echoing broader findings that environmental degradation and associated economic disruptions contribute to psychological distress (Addae, 2012). Moreover, international research on child labor in mining contexts indicates that children engaged in or affected by mining often face psychological distress due to disrupted routines, increased responsibility, and hazardous conditions (Human Rights Watch, 2013). For example, studies on artisanal and small-scale mining document that involvement in mining is linked to exhaustion, distraction, and emotional stress, which impede educational engagement and emotional stability (Journal of African Studies, 2025).

The linkage between psycho-social wellbeing and mining is also supported by findings showing that mining-related socio-economic instability can undermine community

cohesion, heighten anxiety, and reduce opportunities for healthy social interactions (Journal of Rural and Community Studies, 2022). Although much of this evidence comes from adult populations or broader community studies, it is relevant in interpreting the emotional burden reported by learners and families in Hwange.

Ultimately, the experiences expressed by learners *"Sometimes I can't play or meet my friends because I have to help at the mines..."* thus reflecting a loss of normal childhood social interaction, a factor well-recognized in psychological research as crucial for healthy development (Pulver, 2024). The prevalence of anxiety, distraction, and reduced social engagement among students living in mining-affected areas underscores the need for psycho-social support systems that address not only educational barriers but also the emotional wellbeing of learners.

Environmental, familial, and socio-economic factors associated with mining that affect learners' schooling

The findings show that environmental, familial, and socio-economic factors linked to mining significantly shape students' schooling experiences in Hwange District. Learners described how mining-related environmental hazards, such as dust and noise, disrupted their health and school attendance (*"The dust from the mines makes it hard to breathe, and sometimes I get sick and miss school"*). Others highlighted family labour obligations, noting that helping parents at mining sites reduced time for homework and study (*"I have to help my parents at the mining sites, and that takes away time for homework and studying").* Socio-economic pressures were emphasized when learners said, *"Because my family depends on mining for money, I feel pressured to work instead of focusing on school."* Teachers and parents similarly identified labour obligations and economic insecurity as contributors to inconsistent attendance and poor academic engagement.

These findings are consistent with existing literature that links environmental degradation from mining with educational disruption. For example, studies in mining regions of Ghana note that environmental hazards, particularly dust and noise are associated with increased health problems among children, leading to absenteeism and diminished classroom participation (Darko, 2018). Such environmental challenges undermine students' ability to attend school regularly and sustain academic focus (Moyo & Chikozho, 2020).

The influence of family obligations tied to mining work on schooling outcomes is also widely documented. Research on artisanal and small-scale mining in sub-Saharan Africa reveals that children often contribute economically to family livelihoods, prioritizing income-generating tasks over schooling, which in turn reduces study time and increases dropout risk (Addae, 2012; Human Rights Watch, 2013). The current findings echo these studies: learners expressed economic pressures that led them to balance schooling with income-related responsibilities.

Socio-economic pressures linked to mining are similarly reported in broader educational research. UNICEF (2018) highlights that in mining-affected communities, families may depend heavily on mining income, which can create competing demands for children's time between schooling and economic activities. These demands often exacerbate inequalities in educational access, particularly when families view short-term income from mining as more immediately beneficial than long-term educational investment (UNICEF, 2018).

In addition, the findings underscore how infrastructure limitations associated with mining such as blocked roads due to truck traffic affect school attendance (*"The roads are often blocked by mining trucks, and I end up coming late to school").* Similar infrastructural disruptions have been documented in mining communities where transportation challenges hinder students' access to school and reduce attendance rates (Bates et al., 2021).

Collectively, these findings illustrate that environmental, familial, and socio-economic dimensions of mining do not operate in isolation; rather, they interact to create compounded barriers to educational engagement. The persistent pressure to contribute to family income, coupled with environmental health risks and infrastructural impediments, creates a learning environment where students' schooling is frequently compromised.

Perceived benefits and challenges of mining on students' educational aspirations and motivation

The study found that learners hold mixed perceptions regarding the influence of mining on their educational aspirations and motivation. Many students recognized that mining provides financial support for school fees, uniforms, and other necessities, as reflected in comments like *"Mining helps my family get money for school fees and uniforms, so I feel motivated to go to school."* However, learners also expressed that the demands of mining-related work and peer influences can distract from school engagement**,** e.g., *"Sometimes I want to study, but I feel distracted because I have to think about helping my family with mining work."* Teachers observed that students struggle to balance schooling with family responsibilities, while parents highlighted concerns that children might prioritize mining over education, potentially affecting long-term career aspirations.

These findings are supported by the literature on mining and educational outcomes. Research in Zimbabwe and other sub-Saharan African contexts indicates that while mining can temporarily improve school access through financial support, it also exposes children to competing economic responsibilities that can reduce motivation for formal education (Moyo & Chikozho, 2020; UNICEF, 2018). Studies in Ghana's small-scale mining communities similarly found that children who benefit economically from mining may experience internal conflict**,** as economic incentives compete with educational goals (Darko, 2018).

Moreover, prior research highlights the social dimension of mining as a factor influencing aspirations. Ncube and Marange (2019) observed that children in mining-affected communities often face peer pressure to enter mining work, which can diminish educational ambitions. This aligns with the current study, where learners reported concern about friends leaving school to work in mines (*"Some of my friends*

think it's better to leave school and work in the mines, and it makes me worry about my own future").

While the financial benefits of mining may support short-term educational engagement, the long-term effects on motivation can be adverse if mining work becomes normalized as a livelihood path. This duality financial opportunity versus distraction and demotivation has been documented in multiple studies, emphasizing that the context-specific dynamics of mining communities influence both aspirations and commitment to education (Human Rights Watch, 2015; Addae, 2012).

Overall, the findings indicate that mining simultaneously provides resources that support schooling and creates barriers that undermine educational motivation**,** highlighting the need for interventions that protect learners' time, focus, and long-term aspirations.

Context-specific recommendations for schools, policymakers, and community *stakeholders to support students' academic and psycho-social wellbeing*

The study highlighted several recommendations from learners, teachers, and parents aimed at supporting students in mining-affected communities. Learners emphasized the importance of remedial classes**,** school-based counseling, and community interventions, as reflected in comments such as *"It would help if schools could give extra classes for students who miss lessons because of mining"* and *"I think we need someone at school to talk to when mining problems make it hard to focus on learning."* Teachers recommended structured support programs and strengthened partnerships with parents, while parents highlighted the need to balance children's mining-related responsibilities with their schooling. Some parents also called for policy interventions to protect children from excessive labor while promoting education (*"The government or community leaders should make rules to protect children from too much mining work so they can focus on education").*

These recommendations align with evidence from the literature emphasizing multi-level interventions in mining-affected areas. UNICEF (2018) argues that education outcomes in mining communities can be improved through school-based remedial support, psychosocial counseling, and community engagement programs that address both academic and emotional needs. Similarly, Moyo and Chikozho (2020) note that collaboration between schools, families, and local authorities is essential for mitigating the negative educational impacts of mining, including absenteeism, fatigue, and distraction.

Research also highlights the importance of context-specific policy measures to safeguard children's wellbeing. Human Rights Watch (2015) emphasizes that in regions with artisanal and small-scale mining, government regulations and community-led initiatives are crucial to limit child labor and ensure that children can prioritize schooling. Pulvar (2024) further supports school-based psycho-social support, highlighting that emotional distress in mining-affected communities particularly solastalgia and anxiety can compromise both academic engagement and overall wellbeing.

Learner-centered interventions, such as scholarships, incentives, and supportive infrastructure, are also recommended in the literature. Addae (2012) and Darko (2018) stress that financial support combined with structured educational programs can improve school attendance, motivation, and performance, particularly when economic pressures from mining threaten to divert children from schooling. The current findings echo this perspective, as learners themselves suggested remedial classes, counseling, and community involvement to create a safer and more supportive educational environment.

VI. Recommendations

School-Based Academic Support

To address the academic challenges faced by students in mining-affected communities, schools should implement remedial and catch-up programs for learners who miss lessons due to mining-related responsibilities. Teachers can offer after-school tutoring or weekend study sessions to ensure students keep pace with the curriculum and do not fall behind. Additionally, providing adequate learning materials and resources for students from mining-impacted families can help reduce educational inequities and create a more supportive learning environment (Addae, 2012; UNICEF, 2018).

Psycho-Social Support and Counseling

Given the emotional and psychological pressures associated with living in mining-affected areas, it is critical to establish school-based counseling services that help students cope with stress, anxiety, and other emotional challenges (Pulver, 2024). Schools should also implement peer-support groups and mentorship programs to strengthen social support networks and reduce feelings of isolation among learners. Moreover, training teachers and parents to recognize signs of stress and emotional distress in students can facilitate early intervention and promote students' overall psycho-social wellbeing (Ncube & Marange, 2019).

Parental and Community Engagement

Parents and community members play a central role in supporting students' education. Parents should be encouraged to balance children's involvement in mining-related tasks with schooling, ensuring that household responsibilities do not interfere with learning. Communities can also organize awareness campaigns highlighting the importance of education and the risks associated with excessive child labor in mining (Human Rights Watch, 2015). Additionally, partnerships between schools, local authorities, and mining companies can help monitor and limit child labor while promoting opportunities for students to remain engaged in their education.

Policy and Government Interventions.

Policymakers should enforce regulations that prevent excessive child labor in mining-affected areas and protect children's right to education (UNICEF, 2018). Governments and local authorities can also introduce financial support

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schemes, scholarships, or incentives to help students from mining-impacted families maintain consistent school attendance and motivation. Improving infrastructure around schools, such as safe roads and mitigation of environmental hazards, is also critical to ensure both accessibility and the health safety of learners.

Environmental and Health Interventions

Mining-related environmental hazards, including dust and noise, can negatively impact students' health and academic performance. Efforts should be made to reduce exposure to such hazards and to implement preventive measures to protect students' wellbeing (Moyo & Chikozho, 2020). Schools and communities should also provide regular health screenings and interventions for students affected by mining-related environmental factors to ensure that health issues do not compromise learning.

VII. Conclusion

The study revealed that mining activities in Hwange District have significant and multi-dimensional impacts on secondary school students, affecting both their academic performance and psycho-social wellbeing. Learners reported fatigue, absenteeism, and difficulties concentrating in class due to mining-related family responsibilities and environmental challenges. They also experienced stress, anxiety, and emotional strain linked to their communities' dependence on mining income. Teachers and parents corroborated these findings, highlighting the compounded effects of environmental hazards, family labor obligations, and socio-economic pressures on students' educational engagement and overall development.

The findings align with existing literature, which demonstrates that while mining can provide economic support that enables school attendance, it simultaneously introduces environmental, social, and economic challenges that disrupt learning and negatively affect students' motivation and aspirations (Kabonga, 2023; Darko, 2018; UNICEF, 2018; Pulver, 2024). Students in mining-affected communities often face competing demands between education and economic contribution, and exposure to environmental hazards can further undermine their health, concentration, and school participation.

To address these challenges, the study underscores the importance of holistic, multi-level interventions. School-based academic support and counseling services can help students maintain learning continuity and cope with emotional stress. Engagement of parents and community members is crucial to balance children's responsibilities with schooling and foster a supportive environment. Policymakers and local authorities must enforce regulations that limit child labor, provide financial incentives, and improve school infrastructure to mitigate environmental risks. Together, these interventions can create a more enabling environment that supports students' academic achievement, psycho-social wellbeing, and long-term aspirations.

Ultimately, addressing the intertwined educational, psycho-social, and socio-economic challenges in mining-affected communities is essential for ensuring that students can fully realize their potential, remain motivated to learn, and thrive in both school and life.

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Author Contribution Statement

Bhiri Kuziwa conceptualized the study, conducted data collection and analysis, and prepared the manuscript. Mudenda Henry contributed to the research design, review of literature, interpretation of findings, and critical revision of the manuscript.

Conflict of Interest Statement

The authors declare that there is no conflict of interest regarding the publication of this paper.

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