

DOI: <https://doi.org/10.57125/FED.2026.03.16>

How to cite: Chikusvura, N., & Chikuvadze, P. (2026). Effectiveness of assessment strategies for learner placement into IGCSE extended mathematics at a selected Zimbabwean high school. *Futurity Education*, 6(1), 292–307. <https://doi.org/10.57125/FED.2026.03.16>

Effectiveness of Assessment Strategies for Learner Placement into IGCSE Extended Mathematics at a Selected Zimbabwean High School

Chikusvura Namatirai*

Master of Science Education Degree in Measurement, Assessment and Evaluation, Department of Curriculum & Educational Management Studies, Bindura University of Science Education, Zimbabwe, <https://orcid.org/0009-0006-5680-3322>

Chikuvadze Pinias

Lecturer, Department of Curriculum & Educational Management Studies, Bindura University of Science Education, Zimbabwe, <https://orcid.org/0000-0002-8569-0009>

***Corresponding author:** nchikusvura@gmail.com.

Received: December 17, 2025 | **Accepted:** March 14, 2026 | **Available online:** March 25, 2026

Abstract: This study examined assessment strategies for placing learners in IGCSE Extended Mathematics at a selected high school in Zimbabwe. Adopting a pragmatist paradigm and mixed-methods approach, the research employed semi-structured questionnaires, interviews, and document analysis. Using stratified random sampling, 30 learners were selected, while purposive sampling was used to select four mathematics teachers. Quantitative data underwent descriptive statistical analysis, and qualitative data were subjected to thematic analysis, with ethical considerations central throughout. Results indicated

that placement decisions relied predominantly on summative assessments, particularly midyear and end-of-year examinations. The assessment strategies proved only partially effective due to inconsistent application and the absence of formalised guidelines, culminating in learner misplacement, diminished confidence, and inadequate post-placement support. Teacher bias, inconsistent application, and lack of systematic oversight further compromised effectiveness. Respondents emphasised the necessity of holistic approaches that integrate multiple assessment criteria with academic and socio-emotional considerations. The study concludes that effective placement requires balancing diagnostic accuracy with educational fairness to ensure decisions accurately reflect learners' abilities while promoting equitable access to academic success. Recommendations include implementing multi-criteria decision-making frameworks and establishing systematic monitoring mechanisms for placement decisions.

Keywords: Assessment strategies, learner placement, International General Certificate of Secondary Education Extended (IGCSE) Mathematics, learner pathways, mixed methods, Zimbabwe, secondary education, formative assessment.

Introduction

Research Problem

The placement of learners into suitable mathematics pathways is a globally significant challenge with direct consequences for academic achievement, learner confidence, and long-term educational equity. Internationally, countries have developed sophisticated frameworks to guide such decisions. In the United States, diagnostic tools and ongoing progress monitoring guide placement into advanced mathematics courses (National Council of Teachers of Mathematics, 2020). Similarly, the United Kingdom employs the Cambridge Mathematics framework, utilising Assessment for Learning (AfL) to inform placement decisions based on systematic classroom evidence (Irons & Elkington, 2021). Countries such as South Korea and Singapore benefit from systematic formative assessment systems that enhance both instructional quality and placement accuracy (Shipherd, 2020).

In contrast, sub-Saharan Africa faces significant challenges in implementing effective assessment strategies for learner placement (Setyaedhi, 2025). Limited access to diagnostic tools in South Africa and Botswana, inconsistent application of continuous assessments in Kenya, and the absence of standardised diagnostic strategies in Ghana collectively hinder informed decision-making regarding student placement (Khumalo, 2020; Muriithi & Khatete, 2021; Mensah & Kissi, 2023). This landscape is compounded by systemic issues, such as ineffective policy implementation and insufficient professional development opportunities for teachers (Smith, 2022), leading placement decisions to rely on informal assessments rather than data-driven methods.

In Zimbabwe, research has predominantly focused on public schools, highlighting the need for learner-centred assessments (Gasva & Phiri, 2023; Chanda & Mafugu, 2023). However, a critical research gap exists regarding private schools implementing the Cambridge International General Certificate of Secondary Education (IGCSE) curriculum. These schools frequently utilise internal evaluations or teachers' judgments for placement in IGCSE Extended Mathematics, practices that may not accurately reflect learners' academic readiness and risk perpetuating inequitable access to quality education (Lenawati et al., 2022; Maphosa & Ndlovu, 2024).

Research Focus

This study focuses on a high school in Zimbabwe that offers the Cambridge IGCSE curriculum. Within this context, learners in Form Three must be placed into either the Core or Extended Mathematics pathway, a decision with significant implications for their access to higher-level qualifications and future academic opportunities. The Extended pathway demands a stronger mathematical foundation. It covers more advanced content, so inappropriate placement can result in learner failure, disengagement, or under-challenging capable students placed in Core classes.

Research Aim and Research Questions

This study aims to explore the effectiveness of assessment strategies used for learner placement in IGCSE Extended Mathematics at a selected high school. The following research questions guided the study:

1. What assessment strategies are used to place learners into IGCSE Extended Mathematics?
2. What factors influence learner placement decisions into IGCSE Extended Mathematics, and how effective are these strategies?
3. What challenges are encountered in the placement process, and what measures could be implemented to improve placement outcomes?

Literature Review

Theoretical Framework: Assessment for Learning

This study is grounded in the Assessment for Learning (AfL) framework, originally conceptualised by Black and Wiliam (1998) and subsequently elaborated through extensive empirical work (Black & Wiliam, 2020, 2022, 2023). AfL posits that assessment is most effective when it is embedded within the learning process rather than occurring only at the end of instructional sequences. Central to AfL is the principle that assessment information should be actively used by teachers and learners to adapt instruction, identify knowledge gaps, and support individual learning trajectories (Heritage, 2020, 2021).

The AfL framework distinguishes between formative and summative assessment functions. Formative assessment is ongoing, diagnostic, and primarily concerned with improving learning processes, while summative assessment evaluates learning at fixed points and serves accountability and classification purposes (Irons & Elkington, 2021). An over-reliance on summative data for consequential decisions, such as pathway placement, risks misrepresenting learners' potential, particularly for students whose performance varies across assessment contexts (Brown & Harris, 2020; Brookhart, 2020).

For placement purposes, AfL supports the use of diagnostic assessment, that is, systematic pre-instructional evaluation designed to reveal prior knowledge, conceptual understanding, and readiness for new learning (Heritage, 2021; Looney, 2021). When applied to pathway placement, diagnostic assessment provides actionable, granular information about individual learner competencies that summative grade data alone cannot capture (McMillan, 2020; Maskos et al., 2025). The AfL framework also emphasises the importance of teacher professional judgment as a complement to, rather than a substitute for, formal assessment data. Sadler (2021) argues that skilled teachers integrate multiple evidence sources into holistic placement judgments, but the reliability of such judgments depends critically on structured, transparent frameworks that minimise subjective bias (Wyatt-Smith et al., 2024; Rasooli et al., 2023).

Placement Practices in IGCSE and Cambridge Contexts

The Cambridge IGCSE Mathematics curriculum offers two pathways: Core (targeting grades C to G) and Extended (targeting grades A* to E), with differentiated content and cognitive demands. In English secondary schools, teachers use a combination of Key Stage 2 national test results, teacher-assigned levels, and formative classroom evidence, with formal reviews at the end of each academic year (Irons & Elkington, 2021). Lenawati et al. (2022) documented that private schools offering IGCSE in Malaysia relied predominantly on internal examinations and teacher recommendations, with limited use of externally validated diagnostic tools. Similarly, Maphosa and Ndlovu (2024) found that Zimbabwean private schools utilised internal evaluations that lacked standardisation and moderation. A consistent finding is the tension between standardisation and professional discretion: teacher autonomy significantly shapes outcomes, and subjective evaluations persist even within formally standardised systems (Zhang & Luo, 2022; Doyle et al., 2024; Luo et al., 2023).

Formative Versus Summative Assessment in Placement

Martinez and Lee (2022) documented that over-reliance on summative assessments in placement settings yields static representations of learners' abilities that fail to capture growth or potential. Halim et al. (2024) demonstrated that multi-source assessment systems produce more reliable and valid placement outcomes in secondary mathematics contexts. Well-designed diagnostic instruments can identify specific conceptual gaps that predict learner challenges in advanced mathematics content, enabling proactive placement, though their reliability depends on standardisation and teacher training (Capone, 2024; Brown & Harris, 2020). Van Daal et al. (2022) found that teachers' holistic judgments, when structured by clear criteria, capture dimensions of learner capability not accessible through written tests. However, Batruch and Geven (2023) established that teacher recommendations are susceptible to socioeconomic bias, and Makeleni et al. (2023) found similar patterns of subjectivity in Zimbabwean contexts.

Challenges in Assessment-Based Placement in Sub-Saharan Africa

Setyaedhi (2025) identified limited access to validated diagnostic tools, insufficient teacher training in assessment literacy, and the absence of formalised placement policies as the most significant barriers in sub-Saharan Africa. Mudavanhu et al. (2023) highlighted that weak conceptual understanding at the primary level created knowledge gaps that secondary assessment systems were ill-equipped to detect, resulting in compounding misplacement in Zimbabwe. Wang and Wei (2024) demonstrated in a meta-analysis that pressure-driven parental intervention can override evidence-based professional recommendations and that in contexts lacking formal placement policies, parental influence becomes a dominant, often inequitable, driver of pathway allocation (Ngugi et al., 2024).

Research Method

Sample and Participants

The study was conducted at a selected high school in Zimbabwe, chosen for its active implementation of both Core and Extended Mathematics pathways and for its willingness to participate. Stratified random sampling was used to select 30 learner participants from five Form Three classes, ensuring representativeness by drawing participants across predefined strata based on placement in different ability-streamed classes (Syrj et al., 2024). Purposive sampling was employed to select four teachers, chosen for their direct involvement in learner placement decisions and subject expertise (Palinkas et al.,

2020, 2025). All four teachers held mathematics teaching qualifications with a minimum of three years' experience with IGCSE placement decisions at the school.

Instruments and Procedure

Data collection employed three instruments to enable methodological triangulation. First, a semi-structured questionnaire with closed-ended Likert scale items was administered to learner participants, using a four-point scale (Strongly Disagree to Strongly Agree) to generate quantifiable data on perceptions of assessment and placement strategies (McMillan & Schumacher, 2021). The instrument was pilot-tested with 5 Form Three learners prior to the final administration. Semi-structured interviews lasting approximately 45 minutes each were conducted with the four mathematics teachers, audio-recorded with consent and transcribed verbatim (Chen & Banda, 2020; Rasel et al., 2025). Document analysis of instructional records, mark lists, and available policy documents was conducted (Nowell & Norris, 2021). Ethical approvals were obtained from the school administration and from Bindura University of Science Education's ethics board. Informed consent, confidentiality, and voluntary participation were ensured throughout (Banda & Chen, 2020; Resnik, 2020).

Data Analysis

Quantitative data were analysed using descriptive statistics, including frequencies and percentages (McMillan & Schumacher, 2021). Qualitative data underwent thematic analysis, including verbatim transcription, initial open coding, grouping of codes into broader categories, and identification of overarching patterns related to the research questions (Braun & Clarke, 2021; Nowell & Norris, 2021). Member checking was conducted with teacher participants who confirmed the accuracy of interpretations. Triangulation was achieved by systematically comparing quantitative findings, qualitative interview themes, and documentary evidence (Creswell & Plano Clark, 2023; Bamberger, 2025).

Results

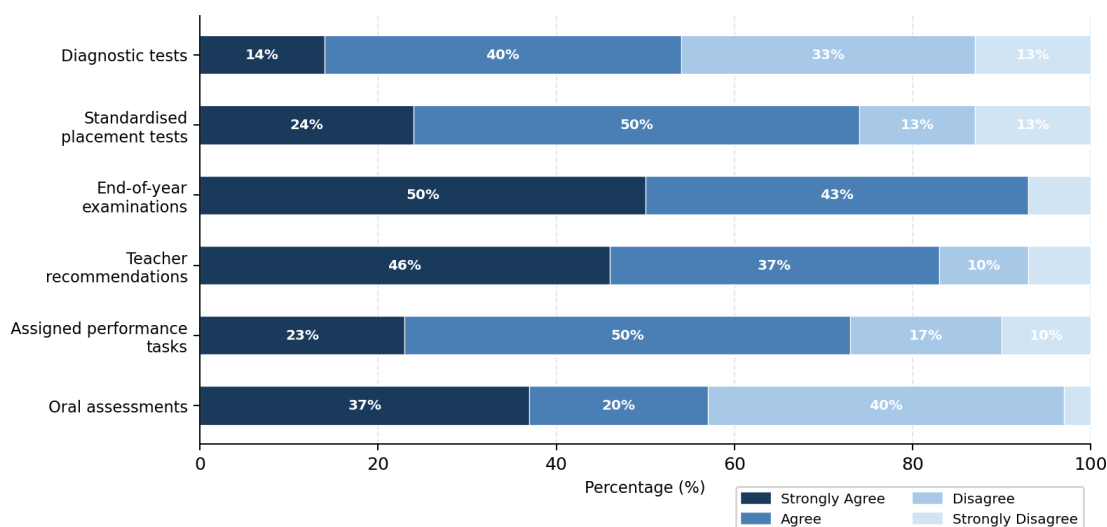
This section presents findings organised thematically according to the three research questions. Quantitative data from learner questionnaires are presented as percentage distributions, while qualitative data from teacher interviews and document analysis illuminate and contextualise the patterns.

Research Question 1: Assessment Strategies Used for Placement

Figure 1 presents the percentage distribution of learner responses to each placement strategy identified in the questionnaire.

Figure 1

Strategies for placing learners in IGCSE Extended Mathematics (n=30)



Source: authors' development.

Diagnostic Tests

Of the 30 Form Three learners, 14% strongly agreed, and 40% agreed that diagnostic tests were used to place learners into IGCSE Extended Mathematics. In contrast, 33% disagreed and 13% strongly disagreed, suggesting inconsistent application across different contexts (Maskos et al., 2025). Teacher interviews corroborated this:

T2: Normally, when we begin Form One, we have what we term placement tests, which, in the years before, we called entrance examinations. So, we give them that test, and then we classify them as first class, second class or third class depending on how they perform in maths.

T3: Sometimes results don't fully reflect a learner's ability, yet they guide placement. Assumptions about class level can unfairly disadvantage exceptions, and there's no clear percentage to define placement or failure.

Standardised Placement Tests

Among respondents, 24% strongly agreed, and 50% agreed that standardised placement tests were used, while 13% disagreed and 13% strongly disagreed. T1 articulated the intent of ensuring no learner was disadvantaged by assessing everyone on the same mathematical content. However, T3 highlighted the absence of formal scoring benchmarks, noting decisions relied more on assumptions and teacher perception than on standardised criteria.

End-of-Year Examinations

End-of-year examinations were the most widely recognised placement strategy: 50% strongly agreed, and 43% agreed they were used for placement, while only 7% strongly disagreed. T2 explained that term three examination results were used to determine the Extended pathway placement for the following year. However, teacher interviews revealed significant informality in translating results into

decisions, with T3 and T4 both noting the absence of a specific policy defining how marks were converted into pathway recommendations.

Teacher Recommendations

Results showed that 46% strongly agreed and 37% agreed that teacher recommendations were used, while 17% disagreed. Teachers described combining formal results with direct classroom observation:

T1: By watching learners daily, I notice improvements in confidence and effort that tests do not show.

T3: Some learners perform poorly in exams, but their participation and problem-solving skills in class tell a different story.

Assigned Performance Tasks

Among respondents, 23% strongly agreed, and 50% agreed that assigned performance tasks were used, while 27% disagreed. Document analysis confirmed that common tests for Forms 1 and 2 were administered on the same dates to ensure comparability. T4 noted the adaptive dimension, observing that some learners were moved after initial placement when their true abilities emerged.

Oral Assessments

Results indicated that 37% strongly agreed and 20% agreed that oral assessments were used, while 43% disagreed. Teacher accounts confirmed limited, unsystematic application, primarily because teachers had not received training in conducting or evaluating oral or practical assessments for placement purposes (T2; T4).

Absence of Formal Placement Policy

A critical finding across all items was the absence of a formal written placement policy. Document analysis confirmed this: the only available document was a parental consent letter acknowledging pathway allocation.

T1: Generally, there is no formal policy guiding placement. Decisions are made arbitrarily, often based on assumptions that certain learners are weak or slow.

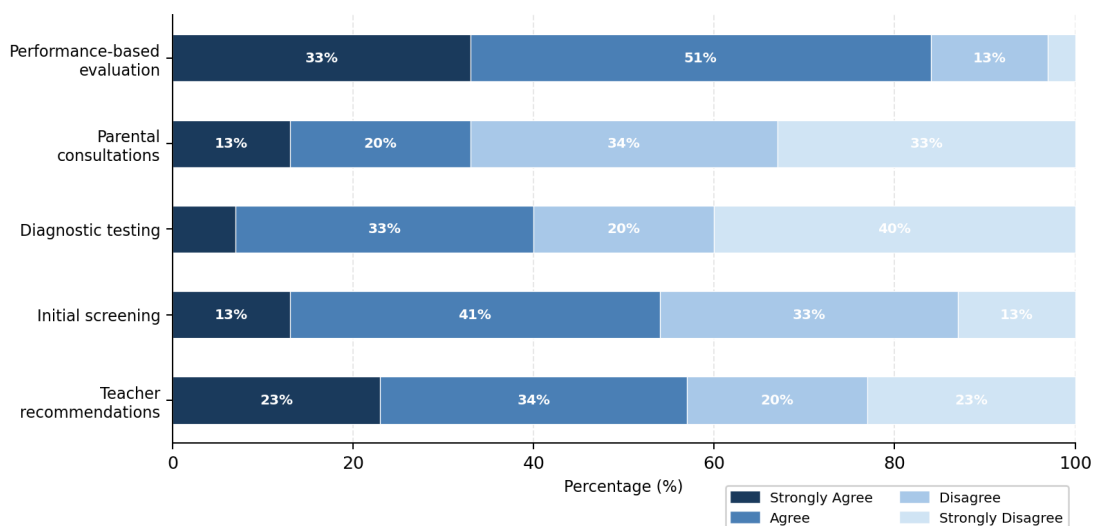
T2: Sometimes parents come and say my child must do Extended Maths because it runs in the family, even if the tests show otherwise.

Research Question 2: Factors Influencing Placement and Effectiveness

Figure 2 presents learner perceptions of factors influencing placement decisions.

Figure 2

Factors influencing learner placement into IGCSE Extended Mathematics (n=30)



Source: authors' development.

Performance-Based Evaluation

Performance-based evaluation was strongly recognised as the dominant placement factor, with 51% of learners agreeing and 33% strongly agreeing (13% disagreed; 3% strongly disagreed). Teachers confirmed that ability-based streaming from set one to set eight was the school's primary organisational approach, with examination performance as the principal criterion (T1; T2).

Parental Consultations

Results showed considerable variation: 33% strongly agreed, 20% agreed, 34% strongly disagreed, and 13% disagreed that parental consultation influenced placement. Teachers reported parental pressure as a disruptive force that, at times, overrode evidence-based professional recommendations, particularly in the absence of a formal policy that provided institutional authority to resist such pressure (T3; T4).

Diagnostic Testing as a Recognised Factor

Despite being used as a strategy, 60% of learners did not recognise that diagnostic testing influenced their placement outcome (40% strongly disagreed; 20% disagreed; 33% agreed; 7% strongly agreed). T1 attributed this to learners writing diagnostics without understanding their purpose, highlighting a communicative gap between the assessment's intent and learners' experience.

Initial Screening and Teacher Recommendations

Initial screening was recognised as a placement factor by 54% of learners (41% agreed; 13% strongly agreed), while teacher recommendations were acknowledged by 57% (34% agreed; 23% strongly agreed). T2 observed that combining classroom observations with diagnostic results improved placement accuracy

by avoiding over-reliance on a single data point. T4 noted that learner uncertainty about the criteria for recommendations undermined perceived fairness.

Research Question 3: Challenges and Possible Solutions

Challenges Affecting Learner Placement

Table 1 presents the distribution of learner responses to six identified placement challenges.

Table 1

Challenges affecting learner placement into IGCSE Extended Mathematics (n = 30)

Challenge	Strongly Agree n (%)	Agree n (%)	Strongly Disagree n (%)	Disagree n (%)
Teacher bias (favouritism)	12 (40%)	7 (23.3%)	7 (23.3%)	4 (13.4%)
Gaps in prior knowledge	9 (30%)	10 (33.3%)	6 (20%)	5 (16.7%)
Parental pressure	11 (37%)	7 (23%)	5 (17%)	7 (23%)
Lack of learner motivation	10 (33.3%)	10 (33.3%)	6 (20%)	4 (13.4%)
Limited parental involvement	6 (20%)	10 (33%)	5 (17%)	9 (30%)
Rigid school placement policy	6 (20%)	6 (20%)	10 (33.3%)	8 (26.7%)

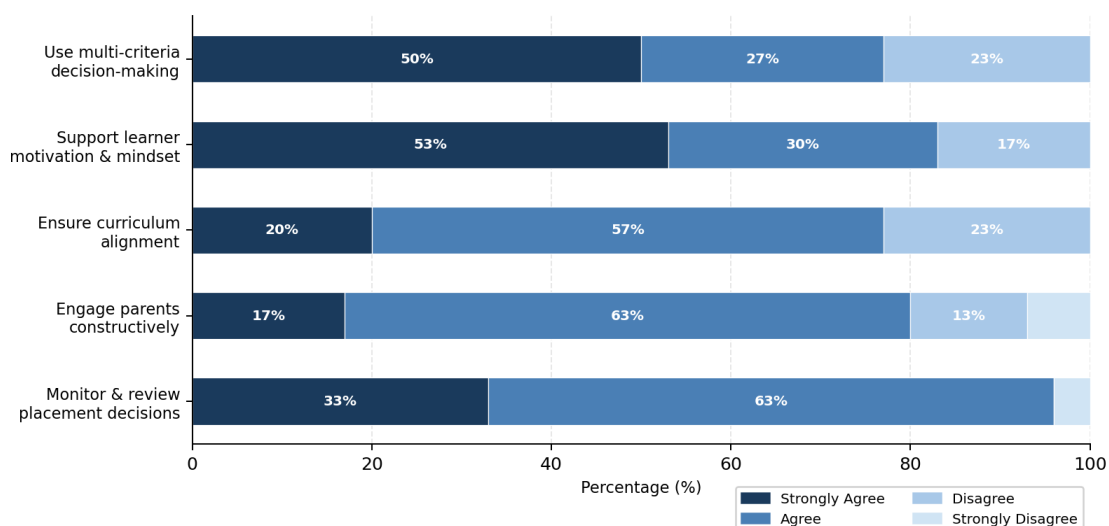
Teacher bias was identified by 63.3% of learners as a persistent concern. Teachers acknowledged the risk, noting that without standard tools or clear guidelines, individual teachers gave their own recommendations, opening the door to bias even when attempting fairness (T4). Parental pressure was identified by 60% as a challenge. Gaps in prior knowledge were recognised by 63.3%, with T1 noting that learners who were unable to handle basic operations and found themselves in Extended naturally began failing. Lack of learner motivation was identified by 66.6%, with T2 observing that confidence dropped visibly when classes were too demanding, and T3 noting that some learners shut down completely after misplacement. 53% noted limited parental involvement. The rigid placement policy item was a concern for only 40%, reflecting the irony that the absence of any formal policy was itself the primary structural challenge.

Possible Solutions

Figure 3 presents learner perceptions of measures to improve the placement process.

Figure 3

Measures to improve the placement process (n=30)



Source: authors' development.

Multi-criteria decision-making was endorsed by 77% of learners. Teachers emphasised that classroom participation, continuous assessment, and learner confidence with complex problems should complement examination results (T1; T3). Supporting learner motivation and mindset was endorsed by 83% of respondents, with T2 stressing the role of staff development and parental engagement. Curriculum alignment was endorsed by 77%, with T3 highlighting that assessments that do not reflect prior learning leave learners struggling. Constructive parental engagement was endorsed by 80%, and monitoring and review of placement decisions by 96%, though T2 and T4 confirmed the absence of any formal monitoring schedule.

Discussion

Synthesis of Findings

The results reveal a placement system in which summative assessment data, particularly end-of-year examination results, serve as the primary basis for pathway allocation, supplemented by teacher judgment and, to a lesser degree, diagnostic and performance-based assessments. This pattern is consistent with the 'summative dominance' identified in international research on placement practices (Martinez & Lee, 2022). However, it sits in tension with the AfL framework's emphasis on multi-source, diagnostically rich evidence as the foundation for consequential educational decisions (Black & Wiliam, 2020, 2023; Heritage, 2020).

Interpretation Through the AfL Framework

Interpreted through the lens of AfL, placement practices at the selected school demonstrate a meaningful commitment to multi-modal assessment, incorporating a range of assessment types that reflect an awareness of learner diversity and contextual complexity. While opportunities exist to further strengthen moderation procedures and formalise evaluative criteria, the existing framework represents a functional and context-sensitive system that aligns with AfL principles in several key respects. Areas for

development include enhancing the transparency of assessment communication to learners: the finding that 60% of learners did not perceive a clear link between diagnostic assessments and their placement outcome points to a communicative dimension that, once addressed, would bring the school's practices into fuller alignment with AfL's emphasis on learner-facing feedback and shared understanding of assessment purposes (Heritage, 2021; Panadero, 2023).

Comparison with International Placement Practices

Benchmarked against international IGCSE and Cambridge placement practices, the selected school's approach reflects standards broadly consistent with those of reputable private institutions operating across comparable educational contexts in sub-Saharan Africa and, in several respects, converges with emerging global practice (Lenawati et al., 2022; Maphosa & Ndlovu, 2024). The school's use of diversified assessment formats positions it within a wider international trajectory toward holistic placement models. Areas of continued professional growth include the further integration of oral and performance-based assessment components, the consideration of externally validated diagnostic instruments, and the formalisation of standardised benchmarks. These developments would align the school with leading IGCSE institutions in East Asia and the United Kingdom, where oral mathematical reasoning tasks and extended problem-solving performances are increasingly recognised as valuable complements to written examinations (Gratchev, 2023; Age, 2025). Collectively, these represent natural next steps in an institutional journey toward assessment excellence rather than fundamental departures from current practice.

Parental Pressure and Educational Equity

The finding that 60% of learners identified parental pressure as a challenge to placement fairness warrants attention from an equity perspective. Wang and Wei's (2024) meta-analysis found that uninformed or coercive parental pressure can override professional recommendations and lead to misplacement. Without a formal placement policy, the school lacks institutional authority to resist such pressure, creating a dynamic in which placement outcomes are partly determined by parental confidence rather than learner readiness. Darling-Hammond and Cook-Harvey (2020) documented analogous dynamics, noting that without transparent criteria communicated to parents in advance, placement processes become susceptible to social capital effects that reproduce rather than mitigate educational inequality.

Study Limitations

Data was collected at a single point in time, making it impossible to track how placement decisions affected learners over time.

Conclusion

This study revealed that learner placement into IGCSE Extended Mathematics at the selected relies on multiple assessment strategies, including end-of-year examinations, teacher recommendations, standardised placement tests, assigned performance tasks, diagnostic tests, and oral assessments. However, the effectiveness of these strategies was significantly compromised by the absence of standardised protocols, teacher bias, parental pressure and gaps in prior knowledge.

Recommendations

The following specific, actionable recommendations are offered:

1. Develop and implement a formal written placement policy specifying assessment instruments to be used, minimum performance benchmarks for Extended Mathematics placement, moderation and standardisation procedures, the process for incorporating teacher recommendations, and an appeals mechanism. This policy should be shared with all stakeholders at the beginning of each academic year.

2. Implement a structured multi-criteria decision-making framework using a weighted composite index: summative examination performance (approx. 50%); diagnostic test results targeting prerequisite Extended Mathematics content (approx. 25%); teacher recommendation scores based on a structured observation rubric covering participation, problem-solving quality, and mathematical reasoning (approx. 15%); and learner self-assessment of readiness (approx. 10%). Specific percentage thresholds for each pathway should be documented and applied consistently.

3. Establish systematic post-placement monitoring mechanisms, including a formal mid-term progress check at the end of Term One, a review meeting between subject teachers and the Head of Mathematics at the end of each term, and a documented protocol for mid-year pathway adjustments when evidence supports reassignment.

Suggestions for Future Research

This study's single-school, cross-sectional design highlights several directions for future investigation. Multi-school studies across institutions would allow comparative analysis and identification of institutional features associated with more effective placement outcomes. Longitudinal studies tracking cohorts from placement through IGCSE examinations would enable assessment of the predictive validity of different placement strategies. Comparative studies between private and government schools offering IGCSE would illuminate how resource availability and policy context shape placement practices. Research examining the impact of specific multi-criteria placement frameworks following the implementation of these recommendations would provide evidence to support broader policy adoption. Finally, qualitative studies exploring the perspectives of misplaced learners would provide crucial insights into the lived consequences of placement practices.

Acknowledgements

Special thanks to Pazvakavambwa Tabettha Nyarai for reading the work and offering valuable suggestions.

Conflict of Interest

None.

Funding

The authors received no funding for this research.

References

- Age, T. J. (2025). Performance-based assessment: A transformative approach to enhancing mathematics learning in Ubuntu classrooms across sub-Saharan Africa. *European Journal of STEM Education*, 10(1). <https://doi.org/10.20897/ejsteme/16420>
- Bamberger, M. (2025). *Integrating qualitative and quantitative research in program evaluation* (2nd ed.). Springer.

- Banda, T., & Chen, L. (2020). Ethical considerations in qualitative research: Privacy and confidentiality. *Qualitative Research Journal*, 20(3), 210–224. <https://doi.org/10.1108/QRJ-06-2019-0050>
- Batruch, A., & Geven, S. (2023). Are tracking recommendations biased? A review of teachers' role in the creation of inequalities in tracking decisions. *Teaching and Teacher Education*, 121, Article 103910. <https://doi.org/10.1016/j.tate.2022.103910>
- Black, P., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education: Principles, Policy & Practice*, 5(1), 7–74. <https://doi.org/10.1080/0969595980050102>
- Black, P., & Wiliam, D. (2020). *Inside the black box: Raising standards through classroom assessment* (10th anniversary ed.). Routledge.
- Black, P., & Wiliam, D. (2022). Classroom assessment and the learning environment. *Assessment in Education: Principles, Policy & Practice*, 29(4), 368–392. <https://doi.org/10.1080/0969594X.2022.2100047>
- Black, P., & Wiliam, D. (2023). Developing a coordinated assessment system for secondary mathematics. *Educational Measurement: Issues and Practice*, 42(3), 35–48. <https://doi.org/10.1111/emip.12545>
- Braun, V., & Clarke, V. (2021). *Thematic analysis: A practical guide*. SAGE.
- Brookhart, S. M. (2020). Assessment practices and reliability in classroom contexts. *Educational Measurement: Issues and Practice*, 39(4), 5–14. <https://doi.org/10.1111/emip.12349>
- Brown, G. T. L., & Harris, L. R. (2020). *Handbook of assessment for learning*. Routledge.
- Capone, R. (2024). Diagnostic testing in education: Design, implementation and outcomes. *Journal of Educational Assessment*, 41(1), 1–22. <https://doi.org/10.1080/02602938.2024.2098761>
- Chanda, T., & Mafugu, F. (2023). Teacher readiness for competency-based O-Level geography curriculum in Zimbabwe. *International Journal of Curriculum Studies*, 15(3), 101–118. <https://doi.org/10.1080/17425964.2023.2145670>
- Chen, H., & Banda, S. (2020). Using document analysis in educational research. *International Journal of Educational Research*, 103, Article 101615. <https://doi.org/10.1016/j.ijer.2020.101615>
- Creswell, J. W., & Plano Clark, V. L. (2023). *Designing and conducting mixed methods research* (4th ed.). SAGE.
- Darling-Hammond, L., & Cook-Harvey, C. (2020). Standardised testing and educational equity: Considerations for policy and practice. *Educational Researcher*, 49(2), 126–136. <https://doi.org/10.3102/0013189X20901530>
- Doyle, L., Harris, P. R., & Easterbrook, M. J. (2024). Quality and quantity: How contexts influence the emergence of teacher bias. *Social Psychology of Education*, 27(4), 1855–1882. <https://doi.org/10.1007/s11218-023-09882-z>
- Gasva, P., & Phiri, D. (2023). Curriculum updates and teacher professional development in Zimbabwean primary schools. *African Education Review*, 20(2), 234–251. <https://doi.org/10.1080/18146627.2023.2045632>

- Gratchev, I. (2023). Replacing exams with project-based assessment: Analysis of learners' performance and experience. *Education Sciences*, 13(4), Article 408. <https://doi.org/10.3390/educsci13040408>
- Halim, L., Abdullah, S., & Yusof, N. (2024). Ensuring reliability in departmental assessments through moderation and standardisation. *Asia-Pacific Journal of Education Assessment*, 10(1), 65–82. <https://doi.org/10.1080/21541969.2024.2078014>
- Heritage, M. (2020). *Formative assessment in practice: A process of inquiry and action*. Harvard Education Press.
- Heritage, M. (2021). Diagnostic assessment in mathematics: Practices and challenges. *Journal of Assessment for Learning*, 7(2), 88–104. <https://doi.org/10.1080/2156-7867.2021.1876210>
- Irons, A., & Elkington, S. (2021). *Enhancing learning through formative assessment and feedback* (2nd ed.). Routledge.
- Khumalo, B. (2020). Diagnostic assessments and learner placement in sub-Saharan Africa. *African Journal of Educational Studies*, 18(2), 90–107. <https://doi.org/10.1080/18146627.2020.1756543>
- Lenawati, S., Maphosa, C., & Ndlovu, R. (2022). Learner placement in private schools: Practices and challenges. *Journal of International Education Studies*, 14(3), 55–70. <https://doi.org/10.5539/ies.v14n3p55>
- Looney, J. (2021). Diagnostic assessment for learner readiness. *Assessment in Education: Principles, Policy & Practice*, 28(3), 345–362. <https://doi.org/10.1080/0969594X.2021.1924500>
- Luo, S., Qi, X., & Liu, H. (2023). Variability in the implementation of standardised tests across schools: Implications for placement decisions. *Assessment in Education: Principles, Policy & Practice*, 30(2), 195–212. <https://doi.org/10.1080/0969594X.2023.2145320>
- Makeleni, T., Ndlovu, S., & Moyo, B. (2023). Teacher subjectivity in learner placement decisions: Evidence from mathematics classrooms. *African Journal of Research in Mathematics, Science and Technology Education*, 27(1), 1–15. <https://doi.org/10.1080/18117295.2023.2145671>
- Maphosa, C., & Ndlovu, P. (2024). Internal examinations and mathematics placement in Zimbabwean ATS schools. *Zimbabwean Journal of Education Policy*, 9(1), 44–60.
- Martinez, J., & Lee, K. (2022). Overreliance on summative assessments in schools: Impacts on learning trajectories. *Educational Measurement Quarterly*, 11(3), 33–52. <https://doi.org/10.1080/01626620.2022.2067890>
- Maskos, K., Schulz, A., Oeksuez, S. S., & Vogelgesang, J. (2025). Formative assessment in mathematics education: A systematic review. *ZDM – Mathematics Education*, 57, 679–693. <https://doi.org/10.1007/s11858-025-01696-x>
- McMillan, J. H. (2020). *Classroom assessment: Principles and practice that enhance student learning and motivation* (7th ed.). Pearson.
- McMillan, J. H., & Schumacher, S. (2021). *Education research: Evidence-based inquiry* (8th ed.). Pearson.

- Mensah, E., & Kissi, P. (2023). Standardised diagnostic assessments and mathematics placement in Ghanaian schools. *African Educational Research Journal*, 12(1), 11–27. <https://doi.org/10.30918/AERJ.121.23.004>
- Mudavanhu, Y., Dziva, D., & Rudhumbu, N. (2023). Weak conceptual understanding and assessment challenges in Zimbabwe's secondary mathematics. *Zimbabwe Journal of Educational Research*, 35(1), 1–18.
- Muriithi, K., & Khatete, L. (2021). Continuous assessment and placement in Kenyan schools: Benefits and limitations. *East African Educational Review*, 23(1), 67–85. <https://doi.org/10.1080/1753097X.2021.1901243>
- National Council of Teachers of Mathematics. (2020). *Catalysing change in high school mathematics: Initiating critical conversations*. NCTM.
- Ngugi, K., Otieno, M., & Kamau, P. (2024). Policy absence and individual judgement in school placements. *African Journal of Educational Policy*, 17(1), 12–28. <https://doi.org/10.1080/18147853.2024.2089007>
- Nowell, L., & Norris, J. (2021). Coding qualitative data: Techniques for thematic analysis in educational research. *Qualitative Research in Education*, 10(2), 99–115. <https://doi.org/10.17583/qre.2021.6686>
- Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and Policy in Mental Health and Mental Health Services Research*, 42, 533–544. <https://doi.org/10.1007/s10488-013-0528-y>
- Palinkas, L., Green, C., Wisdom, J., Duan, N., & Horwitz, S. (2025). Enhancing qualitative sampling techniques in educational research. *Educational Research Quarterly*, 48(2), 29–44.
- Panadero, E. (2023). Self-assessment and learner autonomy in secondary education. *Educational Psychology Review*, 35(2), 289–310. <https://doi.org/10.1007/s10648-023-09741-x>
- Rasel, M., Rahman, M., & Hasan, M. (2025). Designing effective semi-structured questionnaires for educational research. *Journal of Educational Research and Innovation*, 14(1), 33–47. <https://doi.org/10.1080/19415257.2025.2010033>
- Rasooli, A., Rasegh, A., Zandi, H., & Firoozi, T. (2023). Teachers' conceptions of fairness in classroom assessment: An empirical study. *Social Psychology of Education*, 26(1), 199–224. <https://doi.org/10.1177/00224871221130742>
- Resnik, D. (2020). *The ethics of research with human subjects: Protecting participants in educational studies*. Springer.
- Sadler, D. R. (2021). Formative assessment and student learning: Implications for placement. *Assessment in Education: Principles, Policy & Practice*, 28(2), 155–172. <https://doi.org/10.1080/0969594X.2021.1901240>
- Setyaedhi, D. (2025). Challenges in assessment practices in sub-Saharan Africa: A systematic review. *African Journal of Education Research*, 13(1), 33–50. <https://doi.org/10.30918/AJER.131.25.010>

- Shipherd, A. M. (2020). Formative assessment in South Korean and Singaporean schools. *Asia-Pacific Journal of Education*, 40(3), 312–328. <https://doi.org/10.1080/02188791.2020.1745654>
- Smith, J. (2022). Teacher training and assessment literacy: Policy and practice in African schools. *International Journal of Educational Development*, 90, Article 102578. <https://doi.org/10.1016/j.ijedudev.2022.102578>
- Syrjä, T., Luntamo, T., & Laine, M. (2024). Stratified random sampling for educational studies: Practical applications. *Research in Education*, 110(2), 112–129. <https://doi.org/10.1177/00345237231195003>
- van Daal, V. H. P., Pollitt, A., & Coertjens, L. (2022). Using teachers' holistic judgments to establish performance standards in technology education: Implications for assessment validity and reliability. *Frontiers in Education*, 7, Article 806894. <https://doi.org/10.3389/feduc.2022.806894>
- Wang, X., & Wei, Y. (2024). The influence of parental involvement on learners' math performance: A meta-analysis. *Frontiers in Psychology*, 15, Article 1463359. <https://doi.org/10.3389/fpsyg.2024.1463359>
- Wyatt-Smith, C., Adie, L., & Klenowski, V. (2024). Supporting teacher judgement and decision-making: Using focused analysis to help teachers see learners, learning, and quality in assessment data. *British Educational Research Journal*, 50(2), 682–704. <https://doi.org/10.1002/berj.3984>
- Zhang, Y., & Luo, H. (2022). Teachers' perceptions and the interpretation of summative assessment data. *Studies in Educational Evaluation*, 74, Article 101174. <https://doi.org/10.1016/j.stueduc.2022.101174>