IndoMath Indonesia Mathematics Education
ISSN 2614-5103 (Print)
2614-5111 (online)
https://indomath.org/index.php/indomath
Vol 9, No. 2, August 2026, pp. 133-156

Learners' Perceptions of Marking Practices in Informal Mathematics Assessment: Evidence from Secondary Schools

Eric Machisi
Fujairah Boys' School Cycle 3, United Arab Emirates, e.machisi@yahoo.com

Mpho Gift Manamela
Morwasethula Primary School, South Africa, mphogiftbrain@gmail.com

ABSTRACT

This study examined learners' perceptions of marking practices for informal mathematics tasks in 12 public secondary schools in the Pietersburg Circuit of the Capricorn South District, Limpopo Province, South Africa. Although previous research has extensively examined formative assessment and teacher feedback practices, limited studies have explored how learners perceive the effectiveness and usefulness of marking practices for informal mathematics tasks, particularly in under-resourced secondary school contexts. A mixed-methods survey design was employed to collect data from 125 secondary school learners across Grades 8–12. Data were gathered through an online questionnaire comprising Likert-scale and open-ended items. Quantitative data were analyzed using descriptive statistics, chi-square tests, analysis of variance, independent-samples t-tests, and Spearman correlation, while qualitative responses were analyzed thematically. The findings revealed that although self-marking was the most frequently used marking strategy in mathematics classrooms, most learners preferred teacher marking. Learners' satisfaction with the marking system was positively associated with the frequency of teacher marking. No significant differences in perceptions of marking practices were found across grade levels, although perceptions differed significantly according to mathematics achievement level. Qualitative findings indicated that learners value consistent teacher marking, detailed explanatory feedback, supportive correction processes, and meaningful teacher involvement during feedback activities. The study concludes that while self- and peer-marking may support learner participation and self-regulation, regular teacher feedback remains central to learners' confidence, understanding, and engagement in mathematics learning. The findings highlight the importance of balanced marking approaches and clear school-level feedback practices that support meaningful formative assessment in mathematics classrooms.

Keywords: formative assessment, marking practices, mathematics feedback, learner perceptions, informal assessment

ABSTRAK

Penelitian ini bertujuan untuk mengkaji persepsi peserta didik terhadap praktik penilaian melalui pemberian tanda atau koreksi (marking) pada tugas matematika informal di 12 sekolah menengah negeri di Sirkuit Pietersburg, Distrik Capricorn South, Provinsi Limpopo, Afrika Selatan. Meskipun penelitian sebelumnya telah banyak membahas asesmen formatif dan praktik umpan balik guru, masih sedikit penelitian yang mengeksplorasi bagaimana peserta didik memandang efektivitas dan kegunaan praktik penandaan pada tugas matematika informal, khususnya di konteks sekolah menengah yang kurang memiliki sumber daya memadai. Penelitian ini menggunakan desain survei metode campuran dengan melibatkan 125 peserta didik sekolah menengah dari kelas 8 hingga 12. Data dikumpulkan melalui kuesioner daring yang terdiri atas item skala Likert dan pertanyaan terbuka. Data kuantitatif dianalisis menggunakan statistik deskriptif, uji chi-square, analisis varians, uji t sampel independen, dan korelasi Spearman, sedangkan data kualitatif

dianalisis secara tematik. Hasil penelitian menunjukkan bahwa meskipun penilaian mandiri (self-marking) merupakan strategi penandaan yang paling sering digunakan di kelas matematika, sebagian besar peserta didik lebih memilih agar pekerjaan mereka diperiksa langsung oleh guru. Kepuasan peserta didik terhadap sistem penandaan memiliki hubungan positif dengan frekuensi guru dalam memeriksa pekerjaan peserta didik. Tidak ditemukan perbedaan yang signifikan dalam persepsi terhadap praktik penandaan berdasarkan tingkat kelas, namun terdapat perbedaan yang signifikan berdasarkan tingkat pencapaian matematika peserta didik. Temuan kualitatif menunjukkan bahwa peserta didik menghargai konsistensi pemeriksaan oleh guru, umpan balik yang rinci dan bersifat penjelasan, proses koreksi yang suportif, serta keterlibatan guru yang bermakna selama kegiatan umpan balik. Penelitian ini menyimpulkan bahwa meskipun penilaian mandiri dan penilaian teman sebaya dapat mendukung partisipasi serta regulasi diri peserta didik, umpan balik guru yang teratur tetap menjadi faktor utama dalam membangun kepercayaan diri, pemahaman, dan keterlibatan peserta didik dalam pembelajaran matematika. Temuan ini menekankan pentingnya pendekatan penandaan yang seimbang dan kebijakan umpan balik tingkat sekolah yang jelas untuk mendukung asesmen formatif yang bermakna di kelas matematika.

Kata Kunci: asesmen formatif, praktik penandaan, umpan balik matematika, persepsi peserta didik, asesmen informal

INTRODUCTION

Regular classwork and homework tasks are crucial in mathematics learning because they give learners chances to practice procedures, strengthen conceptual understanding, and build problem-solving skills. Frequent practice has been widely linked to better mathematics achievement and a deeper grasp of mathematical concepts (Jansen et al., 2016; OECD, 2024). However, the success of such practice largely relies on the quality of feedback provided to learners. Feedback helps learners identify mistakes, improve their strategies, and enhance their performance (Brookhart, 2017; Hattie & Timperley, 2007). One common way teachers give feedback is by marking learners' classwork and homework exercises.

Marking written work plays a crucial role in formative assessment, as it enables teachers to evaluate learners' progress and identify misconceptions that may require instructional guidance. Through marking, teachers can determine if learning objectives have been met and offer feedback to help learners enhance their understanding (Heritage & Wylie, 2020). Additionally, marking signals to learners that their written work is appreciated, which can boost motivation and engagement with learning tasks (Brookhart, 2017). When learners receive meaningful feedback on their writing, they are better equipped to recognize their strengths, pinpoint errors, and address gaps in their understanding before completing formal assessments.

Despite these benefits, regularly grading learners' written work can place significant demands on teachers. In many school systems, mathematics teachers oversee multiple classes with large enrollments. Studies conducted in South Africa have reported large class sizes in public schools, especially in under-resourced settings (Graham, 2023; Köhler, 2022; Tshangana et al., 2023). Under such conditions, thoroughly grading classwork and homework for all learners may require many hours beyond scheduled teaching time. Excessive grading workloads have been linked to teacher stress and less time for lesson planning (OECD, 2020; Terada & Merrill, 2024; Yongtao, 2025). As a result, teachers often seek alternative strategies to provide feedback while managing the demands of marking.

One common approach is to involve learners in self-assessment or peer-assessment activities. These methods are recognized as effective formative assessment techniques because they encourage learners to reflect on their understanding and develop metacognitive abilities (Fleckney et al., 2025; Ortega-Ruipérez & Correa-Gorospe, 2024). When learners review their own work or their classmates' work, they often become more aware of common mistakes and take greater responsibility for their learning (Power & Tanner, 2023; Yan et al., 2022; Yang et al., 2025). However, concerns have been raised about the accuracy and reliability of student-led grading. Research shows that some learners might overestimate their performance or misassess their work when clear guidance, rubrics, and assessment criteria are not provided (León et al., 2021; Liebenow et al., 2025). For this reason, teachers still bear the responsibility of ensuring that grading practices provide accurate feedback and support learning.

To promote consistency in grading practices, many schools adopt grading and feedback policies that guide how written work is assessed and how often feedback is provided. These policies usually outline the responsibilities of teachers, learners, and school leaders in reviewing learners' written work and providing feedback (National Centre for Excellence in the Teaching of Mathematics, 2016). Effective grading policies aim to ensure that feedback is meaningful and timely while also reducing teachers' workload (Brown et al., 2021). However, in some education systems, including South Africa, many schools lack clear policies on grading informal tasks, such as classwork and homework (Kanjee et al., 2022; Mhlanga et al., 2026). Based on the authors' more than a decade of teaching experience in South African public secondary schools, teachers often rely on their own judgment to decide when and how to review learners' informal tasks.

The absence of clear guidelines can result in considerable inconsistencies in marking practices across mathematics classrooms. While some teachers regularly review learners' written work and provide corrective feedback, others may rely heavily on self-marking or peer-marking approaches with limited teacher oversight. Such inconsistencies may affect the quality, accuracy, and usefulness of feedback provided to learners. In mathematics education, where procedural accuracy and conceptual understanding are closely linked, inconsistent marking practices may contribute to persistent misconceptions, reduced learner confidence, and lower engagement with written tasks (Brandmo & Gamlem, 2025). Learners who rarely receive meaningful feedback may struggle to identify errors and improve their problem-solving strategies.

Learners' perceptions of marking practices are particularly important because they influence how learners interpret and respond to feedback. When learners perceive marking as fair, consistent, and supportive, they are more likely to engage actively with corrections and use feedback to improve their learning (Brandmo & Gamlem, 2025). Conversely, negative perceptions of marking practices may reduce motivation, participation, and trust in assessment processes (Biton, 2025). Investigating learners' perceptions, therefore, provides valuable insights into whether existing marking approaches effectively support learning and whether alternative strategies may be needed to improve learner engagement and understanding in mathematics classrooms. While previous studies have focused primarily on teachers' feedback practices and formative assessment strategies, fewer studies have examined how learners themselves perceive the effectiveness, fairness, and usefulness of marking

practices for informal mathematics tasks, particularly in South African secondary mathematics classrooms.

This study examines learners' perceptions of marking practices for informal mathematics tasks in selected public secondary schools in the Pietersburg Circuit of the Capricorn South District in Limpopo, South Africa. It evaluates how frequently teachers grade classwork and homework, common marking strategies used in mathematics classrooms, learners' preferred marking methods, and their satisfaction with current practices. Additionally, the study explores whether perceptions of marking vary by grade level or mathematics achievement. It also highlights concerns or suggestions expressed by learners regarding current marking practices. Unlike previous studies that mainly investigated feedback practices or formative assessment interventions, this study simultaneously examines learners' preferences, satisfaction, perceived effectiveness, and qualitative experiences regarding routine informal mathematics marking practices. By integrating quantitative and qualitative evidence, the study provides a comprehensive learner-centred perspective on marking practices in secondary mathematics classrooms.

Research Questions

The study was guided by the following research questions:

RQ 1: How frequently do mathematics teachers mark learners' classwork and homework tasks in secondary schools?

RQ 2: What marking strategies (teacher marking, self-marking, and peer marking) are commonly used in mathematics classrooms?

RQ 3: Which marking strategy do learners prefer for the assessment of mathematics classwork and homework tasks?

RQ 4: To what extent are learners satisfied with the current system used to mark mathematics classwork and homework tasks?

RQ 5: What concerns or suggestions do learners express regarding the marking of informal mathematics tasks?

Research Hypotheses

Drawing on formative assessment theory, feedback theory, and self-regulated learning, this study assumes that learners' perceptions of marking practices are shaped not only by the marking strategy employed but also by the quality, consistency, and frequency of feedback they receive. According to feedback theory, meaningful teacher feedback enhances learners' understanding, confidence, and engagement by helping them identify learning gaps and appropriate strategies for improvement (Hattie & Timperley, 2007). Likewise, formative assessment views marking as a learning-oriented process that supports continuous improvement rather than merely serving as an evaluative procedure (Black & Wiliam, 2009; Wiliam, 2018). From the perspective of self-regulated learning, involving learners in self- and peer-marking can promote reflection, metacognitive awareness, and greater responsibility for learning, provided that these activities are supported by appropriate teacher guidance (Panadero et al., 2019; Lei & Lei, 2026). Collectively, these theoretical

perspectives suggest that marking practices may influence learners' perceptions, mathematics achievement, and satisfaction with the marking system. Accordingly, the following hypotheses were formulated and tested.

Previous studies have shown that learners generally perceive teacher feedback as more credible, accurate, and supportive than feedback provided through self- or peer-marking (Brookhart, 2017; Carless & Winstone, 2023). Because learners' perceptions of feedback quality influence their trust in the assessment process and their overall learning experience, their preferred marking strategy is expected to shape their satisfaction with classroom marking practices. Learners who prefer teacher marking may therefore report higher levels of satisfaction when the marking system aligns with their preferences. Based on this rationale, the following hypothesis was proposed:

H1: Learners' preferred marking strategy is significantly associated with their satisfaction with the marking system.

Formative assessment theory suggests that learners develop positive perceptions of assessment when marking practices are implemented consistently, transparently, and aligned with instructional goals (Wiliam, 2018; Carless & Winstone, 2023). Under such conditions, learners across different grade levels are expected to experience similar assessment practices, leading to comparable perceptions of the marking system regardless of their grade placement. Based on this rationale, the following hypothesis was proposed:

H2: Learners' perceptions of marking practices differ significantly across grade levels.

Feedback literacy research suggests that learners with different levels of academic achievement may interpret, value, and utilize feedback differently because they vary in prior knowledge, self-regulation, and evaluative judgment (Carless & Winstone, 2023). As a result, learners with higher and lower achievement levels may develop different perceptions of classroom marking practices and the feedback they receive. Based on this theoretical rationale, the following hypothesis was proposed:

H3: Learners' perceptions of marking practices differ significantly according to their mathematics achievement level.

Formative assessment theory emphasizes that frequent and timely feedback provides learners with continuous opportunities to identify learning gaps, monitor their progress, and improve subsequent performance (Black & Wiliam, 2009; Heritage & Wylie, 2020). Because teacher marking is one of the primary mechanisms through which formative feedback is delivered, more frequent teacher marking is expected to strengthen learners' confidence, engagement, and satisfaction with the assessment process. Based on this theoretical rationale, the following hypothesis was proposed:

H4: The frequency of teacher marking is positively associated with learners' satisfaction with the marking system.

LITERATURE REVIEW

This study is grounded in contemporary theories of formative assessment, feedback, and self-regulated learning. The conceptual framework explains how marking practices in mathematics classrooms shape learners' experiences with feedback, their engagement with written tasks, and

their perceptions of the effectiveness of assessment practices. The framework integrates three complementary perspectives: assessment for learning (formative assessment), feedback theory, and self- and peer-assessment within self-regulated learning. These perspectives are interconnected and collectively explain how marking practices may support or constrain learning in mathematics classrooms.

Assessment for Learning

The primary theoretical foundation of this study is formative assessment, also referred to as assessment for learning. Formative assessment involves classroom practices that gather evidence about learners' understanding and use that evidence to improve teaching and learning (Black & Wiliam, 2009; Wiliam, 2018). Within this perspective, marking classwork and homework is not merely a procedural exercise, but an instructional process intended to identify misconceptions, provide guidance, and support learner improvement.

Research consistently demonstrates that formative assessment enhances learners' conceptual understanding, engagement, and achievement when feedback is timely, meaningful, and aligned with learning goals (Heritage & Wylie, 2020; Wisniewski et al., 2020). In mathematics education, marking written tasks is particularly important because learners often require corrective feedback to identify procedural errors, strengthen conceptual understanding, and refine problem-solving strategies. Contemporary research further emphasizes that effective formative assessment promotes deeper learner engagement with mathematical reasoning and encourages learners to actively participate in the learning process rather than passively receive corrections (Carless & Winstone, 2023; OECD, 2023).

Recent scholarship has also shifted formative assessment from a teacher-dominated activity toward a more socially interactive process. Contemporary perspectives argue that assessment should support learners' capacity to monitor, evaluate, and regulate their own learning rather than focus solely on measuring performance outcomes (Andrade & Brookhart, 2020; Lei & Lei, 2026). However, researchers have also noted that the effectiveness of formative assessment depends heavily on how consistently feedback practices are implemented across classrooms. In contexts where marking practices are inconsistent or feedback is unclear, formative assessment may fail to support meaningful learner improvement. This concern is particularly relevant in mathematics classrooms, where misconceptions can persist when learners do not receive sufficient corrective guidance.

Feedback Theory

The second perspective informing this study is feedback theory, particularly the model proposed by Hattie & Timperley (2007). According to this perspective, feedback plays a central role in reducing the gap between learners' current understanding and desired learning goals. Effective feedback assists learners in answering three key questions: Where am I going? How am I progressing? What should I do next?

In mathematics classrooms, marking practices are among the primary mechanisms for communicating feedback to learners. Teachers may provide feedback by correcting errors, identifying misconceptions, highlighting procedural mistakes, or explaining alternative solution strategies. Consequently, the effectiveness of marking depends not only on whether learners' work is reviewed, but also on the quality, clarity, and usefulness of the feedback provided.

Recent discussions in feedback research increasingly emphasize the concept of feedback literacy, which refers to learners' ability to interpret, evaluate, and use feedback effectively to improve their learning (Carless & Winstone, 2023). Contemporary scholars argue that feedback should not be viewed as a one-way transmission of comments from teacher to learner, but rather as an interactive process that requires active learner engagement. This perspective highlights the importance of learners' perceptions of marking practices, as they are more likely to act on feedback when they perceive it as fair, constructive, and supportive of learning.

At the same time, recent studies suggest that the impact of feedback depends not only on its frequency but also on learners' emotional and cognitive responses. Supportive and specific feedback has been associated with stronger learner motivation, confidence, and self-regulation, whereas unclear or inconsistent feedback may reduce learner engagement and trust in assessment processes (Niyibizi & Mutarutinya, 2024). In mathematics education, where learners often experience anxiety and uncertainty when solving problems, feedback that clearly explains errors and corrective procedures may play an important role in strengthening learner confidence and participation.

Self-Assessment, Peer Assessment, and Self-Regulated Learning

The third theoretical perspective focuses on learner participation in assessment through self-assessment and peer assessment. These approaches are closely linked to theories of self-regulated learning, which emphasize learners' ability to monitor, evaluate, and control their own learning processes (Zimmerman, 2002). Self-assessment encourages learners to reflect critically on their understanding and evaluate their work against established criteria, while peer assessment enables learners to collaboratively review and provide feedback on one another's work.

Research indicates that self- and peer-assessment can strengthen metacognitive awareness, learner autonomy, and problem-solving abilities when implemented effectively (Panadero et al., 2019; Seifert & Feliks, 2019). Recent literature further highlights that formative assessment practices promote self-regulated learning when learners are actively involved in goal setting, reflection, monitoring progress, and responding to feedback (Lei & Lei, 2026; Monteiro & Passarinho, 2026). These processes are particularly relevant in mathematics education because learners must continuously evaluate procedures, identify errors, and adjust solution strategies during problem-solving activities.

Despite these potential benefits, contemporary research also highlights ongoing concerns regarding the reliability and effectiveness of self- and peer-marking practices. Some studies suggest that learners may overestimate their performance, provide inaccurate evaluations, or focus only on final answers rather than underlying reasoning when clear assessment criteria and teacher guidance are absent (Wanner & Palmer, 2018). Other scholars argue that self- and peer-assessment are most

effective when supported by explicit rubrics, teacher scaffolding, and opportunities for guided reflection (León et al., 2021; Liebenow et al., 2025). These debates suggest that learner participation in assessment should complement, rather than replace, teacher involvement in marking practices.

Integrated Conceptual Model

The present study integrates formative assessment, feedback theory, and self-regulated learning into a unified conceptual framework. Within this framework, marking practices in mathematics classrooms are viewed as formative assessment processes designed to provide feedback and support learner engagement in assessment activities. Teacher marking, self-marking, and peer marking are conceptualized as interconnected feedback mechanisms operating within the broader formative assessment process.

Teacher marking provides corrective guidance, identifies misconceptions, and offers detailed explanations to support conceptual understanding. Self- and peer-marking, in contrast, encourage learner participation, reflection, and the development of self-regulated learning skills. The framework assumes that the effectiveness of marking practices depends on three interconnected dimensions: the frequency of marking, the quality of feedback, and learner engagement with feedback.

The framework further proposes that learners' perceptions of marking practices influence their satisfaction with assessment systems, engagement with written tasks, confidence in mathematics learning, and willingness to act on feedback. Learner characteristics such as grade level and mathematics achievement may also shape how learners interpret and respond to marking practices.

Accordingly, this study conceptualizes marking practices not simply as administrative procedures for checking written work, but as interactive formative assessment processes that influence learners' understanding, motivation, and participation in mathematics learning. The framework, therefore, provides a theoretical basis for examining how different marking strategies are experienced by learners and how these experiences shape perceptions of the effectiveness of informal mathematics assessment.

Conceptual Framework

The theoretical perspectives discussed above are integrated into a conceptual framework that illustrates the relationships among the variables examined in this study. The framework proposes that different marking practices, particularly the frequency of teacher marking and learners' preferred marking strategies, influence learners' perceptions of marking practices and their satisfaction with the marking system. In addition, learner characteristics, including grade level and mathematics achievement, may shape how learners perceive and respond to classroom marking practices. Guided by formative assessment, feedback theory, and self-regulated learning, the conceptual framework presented in Figure 1 provides the theoretical foundation for the hypotheses tested in this study.

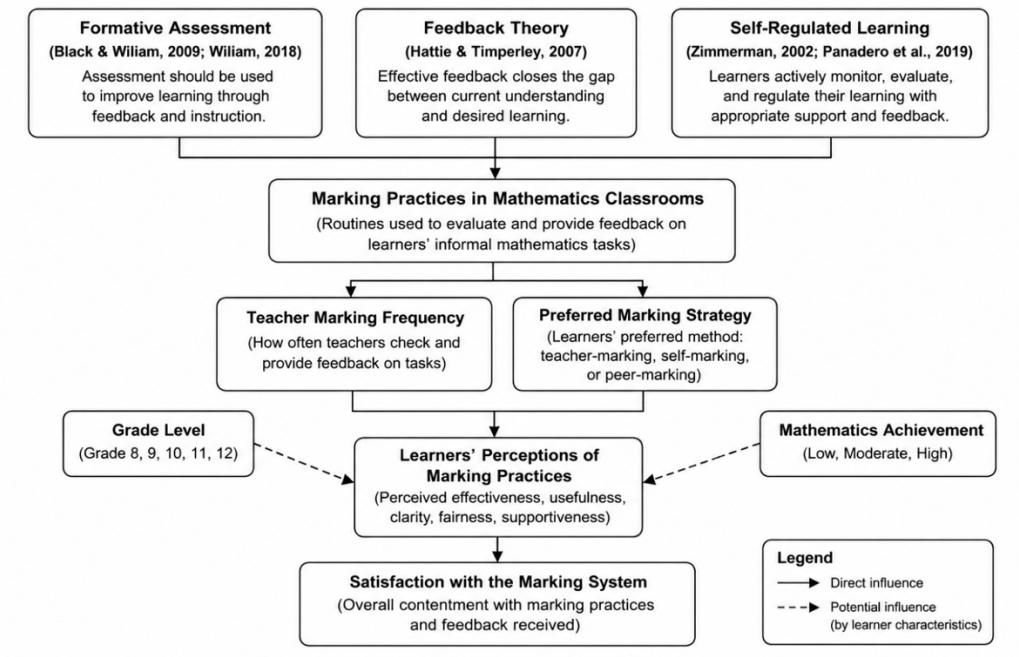

Figure 1. Conceptual Framework of the Study

As illustrated in Figure 1, the study conceptualizes marking practices as formative assessment processes that operate through feedback mechanisms to influence learners' perceptions and satisfaction with classroom assessment. Teacher marking frequency and learners' preferred marking strategies represent the principal assessment-related variables, whereas grade level and mathematics achievement are treated as learner characteristics that may influence perceptions of marking practices. The framework further assumes that meaningful, consistent, and supportive feedback strengthens learners' confidence and satisfaction with the marking system, thereby providing the theoretical basis for the hypotheses examined in this study.

METHOD

Research Design

This study employed a mixed-methods survey design to examine secondary school learners' perceptions of marking practices for informal mathematics tasks. It primarily relied on quantitative data from structured questionnaires, enhanced by qualitative data from open-ended responses that allowed learners to express their views. Mixed-methods designs are beneficial in educational research as they merge statistical analysis with personal perspectives (Creswell & Creswell, 2017; Johnson et al., 2007). Quantitative data were collected through structured questionnaires to examine the frequency of marking practices, learners' preferences for different marking strategies, and their levels of satisfaction with the feedback received, while qualitative data were gathered through open-ended questionnaire items that allowed participants to elaborate on their experiences, opinions, and suggestions. The quantitative component provided numerical evidence of patterns and trends in learners' perceptions, whereas the qualitative component offered deeper insights into the reasons behind these perceptions and highlighted aspects of marking practices that learners considered beneficial or problematic. By combining statistical analysis with learners' personal perspectives, the

study was able to capture both the breadth and depth of their experiences. Furthermore, the integration of quantitative and qualitative findings facilitated data triangulation, thereby enhancing the credibility and richness of the results. This approach provided a more holistic understanding of how learners perceive marking practices in mathematics classrooms and generated valuable evidence for improving assessment and feedback processes in secondary school mathematics education.

Participants and Context

The study was conducted in 12 public secondary schools in the Pietersburg Circuit of the Capricorn South District, Limpopo Province, South Africa. The schools were selected through simple random sampling from 16 public secondary schools within the Pietersburg Circuit. Because the sample was restricted to schools in the Pietersburg Circuit, the findings should not be interpreted as statistically representative of all schools in the Capricorn South District. However, the inclusion of learners from 12 schools and a broad range of mathematics achievement levels provided a sufficiently diverse sample for exploring patterns in learners' perceptions of marking practices within the selected circuit. Participants comprised 125 secondary school learners enrolled in mathematics classes across Grades 8 to 12. Within each selected school, mathematics teachers distributed the online questionnaire link to eligible learners. Learner participation was based on voluntary responses rather than random selection. All responses were collected anonymously to ensure confidentiality.

Table 1. Demographic Characteristics of Participants (N = 125)

Variable	Category	n	%
Gender	Male	44	35.2
	Female	78	62.4
	Prefer not to say	3	2.4
Grade	Grade 8	3	2.4
	Grade 9	5	4.0
	Grade 10	14	11.2
	Grade 11	29	23.2
	Grade 12	74	59.2
Achievement	Level 1	4	3.2
	Level 2	27	21.6
	Level 3	24	19.2
	Level 4	23	18.4
	Level 5	14	11.2
	Level 6	17	13.6
	Level 7	16	12.8

Note. Level 1 (0-29%); Level 2 (30-39%); Level 3(40-49%); Level 4(50-59%); Level 5(60-69%); Level 6(70-79%); Level 7(80-100%)

The study aimed to include learners from different grade levels, genders, and mathematics achievement categories to capture diverse perspectives on marking practices in mathematics classrooms. Demographic information collected included gender, grade level, and mathematics achievement from the previous term. Female learners constituted the majority of participants (62.4%), while male learners accounted for 35.2% of the sample. Although learners from Grades 8 to 12 participated, the sample was weighted more heavily toward senior secondary learners, particularly those in Grades 10 to 12, while Grades 8 and 9 were comparatively underrepresented.

Mathematics achievement levels ranged from Level 1 to Level 7, indicating variation in participants' academic performance. A detailed summary of participant demographics is presented in Table 1.

Instrument

Data were collected via an online questionnaire titled “Learners’ Perceptions on the Marking of Informal Tasks in Mathematics,” designed to capture learners’ experiences relating to the marking of mathematics classwork and homework. The questionnaire was self-developed by the researchers based on the literature on formative assessment, feedback practices, learner participation in assessment, and marking practices in mathematics education. The questionnaire comprised four sections.

Section A gathered demographic information, including gender, grade level, prior mathematics achievement, and school identifier, which were crucial for analyzing differences in perceptions of marking practices. Section B explored perceptions of marking practices using Likert-type items, asking learners about the frequency of practices such as teacher marking, self-marking, peer marking, parental involvement, and teacher review of marked work. Section C allowed learners to indicate their preferred marking method (teacher, self, peer, or teaching assistant) and whether they were satisfied with the current marking system. Finally, Section D provided space for additional comments and suggestions, offering qualitative insights into learners’ experiences.

Validity and Reliability of the Instrument

To ensure the survey's quality and credibility, its validity and reliability were established before data collection. Five experts in mathematics education, including two doctoral scholars and three professors, reviewed the questionnaire for relevance, clarity, and appropriateness with respect to the study's objectives, thereby establishing content validity (Haynes et al., 1995). Their written feedback led to revisions that improved the instrument's clarity and alignment with the intended constructs.

The reliability of the Likert-scale items assessing learners’ perceptions of marking practices was measured using Cronbach’s alpha, a common measure of internal consistency (Tavakol & Dennick, 2011). A Cronbach’s alpha value of 0.70 or higher is generally acceptable (Taber, 2018). After data collection, the internal consistency of the items was assessed in R, yielding a Cronbach’s alpha of 0.87, indicating good internal consistency. The 95% confidence interval ranged from 0.84 to 0.90. An examination of the “alpha if item deleted” statistics showed that removing any item would not substantially improve the scale's reliability. Therefore, all items were retained for subsequent analyses.

Data Collection Procedure and Ethical Considerations

Data were collected through an online survey given to learners in the participating schools. Before collecting data, permission was received from the Limpopo Department of Education and relevant school authorities to distribute the questionnaire. Learners were informed about the purpose of the study and reassured that participation was voluntary and anonymous. They were also told they could refuse to take part in the study without facing any penalties.

The survey was designed to take about 10 minutes to complete. Learners filled out the questionnaire individually and submitted their responses electronically. No personally identifiable information was collected, ensuring participants' confidentiality was maintained. The mathematics teachers at the participating schools helped by sharing the link to the questionnaire Google Form with their learners.

Data Analysis

The data collected in this study included both quantitative and qualitative responses, which were analyzed using several complementary techniques. Quantitative data were analyzed using the R statistical computing environment (version 4.5.2). Before analysis, the dataset was cleaned to remove incomplete or duplicate responses. Responses to Likert-scale items were coded numerically to enable statistical analysis.

Descriptive statistics were first calculated to summarize learners' responses regarding their marking practices. These included frequencies, percentages, means, and standard deviations. These statistics provided an overview of how often different marking practices occurred and of learners' satisfaction with the marking system.

Several inferential statistical tests were conducted to explore relationships among the variables. A Pearson chi-square test of independence was used to examine the relationship between learners' preferred marking strategy and their satisfaction with the marking system. Differences in learners' perception scores between satisfied and dissatisfied learners were analyzed using a Welch independent-samples t-test. To assess whether learners' perceptions of marking practices varied across grade levels and mathematics achievement levels, one-way analyses of variance (ANOVA) were conducted. When significant differences were found among achievement groups, Tukey's Honestly Significant Difference (HSD) post-hoc test was applied to identify specific group differences. Additionally, the relationship between the frequency of teacher marking and learners' satisfaction with the marking system was analyzed using Spearman's rank-order correlation, which is appropriate for ordinal data. All statistical tests were performed at the 0.05 significance level, meaning that results with p-values less than 0.05 were considered statistically significant.

Qualitative responses from the open-ended survey question were analyzed using thematic analysis. The responses were read multiple times to identify recurring patterns and ideas. Similar responses were grouped into themes reflecting common concerns or suggestions expressed by learners regarding marking practices. Combining quantitative and qualitative findings offered a more complete understanding of learners' perceptions of marking practices in mathematics classrooms.

RESULTS AND DISCUSSION

Result of Quantitative

RQ1: How frequently do mathematics teachers mark learners' classwork and homework tasks in secondary schools?

The frequency with which teachers grade learners' classwork and homework was assessed using a 5-point Likert scale, ranging from 1 (Never) to 5 (Always). The results show that teacher

grading occurred fairly often in many classrooms. The largest groups of learners reported that teachers always grade their written work (27.2%, n = 34) or frequently grade their work (26.4%, n = 33) (see Table 2). An additional 22.4% of learners (n = 28) reported that their work is sometimes graded.

Table 2. Frequency of Teacher Marking of Classwork and Homework Tasks (N = 125)

Response	Frequency (n)	Percentage (%)
Never	10	8.0
Rarely	20	16.0
Sometimes	28	22.4
Often	33	26.4
Always	34	27.2

However, a notable portion of learners reported infrequent grading. Specifically, 16.0% (n = 20) said their work is rarely graded, while 8.0% (n = 10) reported that teachers never grade their work. Overall, these findings suggest that while many learners experienced regular grading of written tasks, a significant minority perceived grading as happening infrequently in their mathematics classes.

RQ 2: What marking strategies (teacher marking, self-marking, and peer marking) are commonly used in mathematics classrooms?

To examine the marking strategies commonly used in mathematics classrooms, descriptive statistics were calculated for the relevant survey items. The results indicate that self-marking was the most frequently used strategy (M = 4.22, SD = 0.88) (see Table 3), suggesting that learners are regularly encouraged to evaluate their own work after completing class exercises, assignments, or homework tasks. The high mean score and relatively low standard deviation indicate that self-marking was not only common but also consistently reported across participants. This finding may reflect teachers' efforts to promote learner autonomy, self-reflection, and responsibility for learning, which are important components of formative assessment practices. Through self-marking, learners are provided with opportunities to identify mistakes, monitor their understanding, and assess their progress against expected solutions. Teacher marking was also reported to occur fairly often (M = 3.49, SD = 1.27), indicating that teachers continue to engage actively in assessing learners' written work and providing feedback. The moderate variation in responses suggests that the frequency of teacher marking may differ across classrooms, possibly due to differences in teachers' assessment practices, workload, or instructional approaches.

Table 3. Marking Strategies Used in Mathematics Classrooms (N = 125)

Item	Mean	SD	Median
The teacher marks learners' work	3.49	1.27	4
Learners mark their own work	4.22	0.88	4
Learners mark classmates' work	2.60	1.44	3
Teacher checks marked work	3.45	1.48	4
The teacher corrects errors	3.35	1.52	4

In contrast, peer marking was reported less frequently (M = 2.60, SD = 1.44), indicating that learners do not regularly assess the work of their classmates. The relatively low mean score and higher variability suggest that peer-marking practices are not consistently implemented across mathematics classrooms. This may reflect teachers' concerns about the accuracy of peer assessments or limited opportunities for collaborative assessment activities. Furthermore, learners reported that teachers regularly check marked work (M = 3.45, SD = 1.48) and correct errors or misconceptions identified in learners' responses (M = 3.35, SD = 1.52). These findings highlight the continued importance of teacher involvement in the assessment process, even in contexts where self-marking is widely practiced. Teachers appear to play a critical role in validating learners' assessments, ensuring the accuracy of marking, and providing corrective feedback that supports conceptual understanding. Overall, the results suggest that mathematics classrooms employ a combination of marking strategies, with self-marking serving as the dominant approach while teacher oversight remains essential for maintaining the quality and effectiveness of assessment practices.

RQ 3: Which marking strategy do learners prefer for the assessment of mathematics classwork and homework tasks?

Learners were asked to indicate their preferred marking strategy for classwork and homework activities. The results revealed a clear preference for teacher marking, with 61.6% of respondents (n = 77) identifying it as their favored approach (see Table 4). This strong preference suggests that learners place considerable value on feedback provided directly by their teachers, whom they may perceive as the most knowledgeable and reliable assessors of their work. Teacher marking may also be preferred because it provides learners with a greater sense of confidence in the accuracy and fairness of the assessment process. In addition, learners may associate teacher feedback with more detailed explanations, corrective guidance, and opportunities to improve their understanding of mathematical concepts and procedures.

Table 4. Learners' Preferred Marking Strategy (N = 125)

Marking Strategy	Frequency (n)	Percentage (%)
Teacher marking	77	61.6
Self-marking	37	29.6
Peer marking	3	2.4
Teaching assistant marking	8	6.4

The second most preferred marking strategy was self-marking, selected by 29.6% of learners (n = 37). This finding indicates that a substantial proportion of learners appreciate opportunities to assess their own work, possibly because self-marking promotes independence, self-reflection, and awareness of errors. However, despite the frequent use of self-marking in classrooms, it was considerably less preferred than teacher marking. In contrast, peer marking was the least favored option, with only 2.4% of learners (n = 3) selecting it as their preferred strategy, while 6.4% (n = 8) preferred marking by a teaching assistant. The low preference for peer marking may reflect concerns about the accuracy, fairness, or credibility of assessments conducted by classmates. Overall, these

findings suggest that although self-marking is commonly practiced in mathematics classrooms, learners generally prefer their work to be marked by teachers, highlighting the importance they attach to teacher expertise, feedback quality, and professional judgment in the assessment process.

RQ 4: To what extent are learners satisfied with the current system used to mark mathematics classwork and homework tasks?

Learners were asked whether they were satisfied with the marking system used for mathematics classwork and homework. The results indicate that a majority of learners, 53.6% (n = 67), reported being satisfied with the current marking practices (see Table 5). This finding suggests that more than half of the participants perceive the marking system as effective in evaluating their work and providing useful feedback on their performance. Learners' satisfaction may be associated with the regularity of marking, the clarity of feedback provided, or the opportunities they receive to identify and correct mistakes. The positive responses also imply that existing marking practices generally meet the expectations of many learners and contribute to their understanding of mathematical concepts and procedures.

Table 5. Learner Satisfaction with the Marking System (N = 125)

Response	Frequency (n)	Percentage (%)
Satisfied	67	53.6
Not satisfied	20	16.0
Prefer not to say	38	30.4

However, the findings also reveal areas of concern. A total of 16.0% of learners (n = 20) reported dissatisfaction with the marking system, indicating that a notable minority may perceive shortcomings in the way their work is assessed or the feedback they receive. Furthermore, 30.4% of learners (n = 38) chose not to express an opinion on the question. The relatively large proportion of neutral or non-committal responses may suggest uncertainty about the effectiveness of the marking system, limited engagement with assessment practices, or reluctance to provide evaluative judgments. Taken together, these findings indicate that while learner satisfaction with marking practices is generally positive, a substantial proportion of learners either express dissatisfaction or remain undecided. This highlights the need for teachers to continuously review and refine their marking approaches to ensure that assessment practices are transparent, supportive, and responsive to learners' needs.

Hypotheses Testing

H1: Learners' preferred marking strategy is significantly associated with their satisfaction with the marking system.

A Pearson chi-square test of independence was performed to assess whether learners' preferred marking strategy was associated with their satisfaction with the marking system. The results showed no statistically significant link between preferred marking strategy and learner satisfaction, $\chi^2(6) = 5.54$, $p = .476$. These findings suggest that learners' satisfaction with marking

practices did not vary significantly by preferred marking approach. The effect size was small (Cramer's V = .15), suggesting only a weak relationship between the variables.

An independent-samples Welch t-test was conducted to examine whether learners' perceptions of marking practices differed by their satisfaction with the marking system. The analysis revealed a statistically significant difference in perception scores between satisfied and dissatisfied learners, $t(32.55) = -3.02$, $p = .005$. Learners who reported being satisfied with the marking system had higher perception scores ($M = 3.36$) than those who were not satisfied ($M = 2.65$). The effect size was moderate to large (Cohen's $d = 0.75$), indicating a meaningful difference between the two groups. These findings suggest that learners who view marking practices more positively are significantly more likely to report satisfaction with the marking system.

H2: Learners' perceptions of marking practices differ significantly across grade levels.

A one-way analysis of variance (ANOVA) was conducted to determine whether learners' perceptions of marking practices differed across grade levels. The analysis revealed no statistically significant difference in perception scores among learners from different grade levels, $F(1, 123) = 2.05$, $p = .155$. Since the p-value exceeded the conventional significance threshold of .05, the null hypothesis was retained, indicating that grade level was not significantly associated with differences in learners' perceptions of marking practices. This finding suggests that learners, regardless of their grade level, tend to share similar views regarding how classwork and homework are marked in mathematics classrooms.

The absence of significant differences across grade levels may indicate that marking practices are implemented relatively consistently throughout the school, providing learners with comparable assessment experiences as they progress through different grades. It may also suggest that factors other than grade level, such as individual learner characteristics, teacher feedback quality, classroom assessment culture, or prior experiences with assessment, play a more influential role in shaping learners' perceptions. Overall, the findings imply that perceptions of marking practices are generally stable across grade levels, reflecting a common understanding and experience of assessment procedures among secondary school learners.

H3: Learners' perceptions of marking practices differ significantly according to their mathematics achievement level.

A one-way ANOVA was conducted to assess whether learners' perceptions of marking practices differed by mathematics achievement level. The analysis found a significant difference in perception scores among achievement groups, $F(6, 118) = 2.19$, $p = .049$. This indicates that learners' perceptions of marking vary with their level of mathematics achievement. Post-hoc comparisons were made using Tukey's HSD test to identify which achievement levels differed significantly.

Post hoc comparisons using Tukey's HSD test showed that the only significant difference was between Achievement Level 7 and Achievement Level 6 ($p = .033$), with learners in Level 7 reporting

higher perception scores than those in Level 6. No other pairwise comparisons were statistically significant.

H4: The frequency of teacher marking is positively associated with learners' satisfaction with the marking system.

A Spearman rank-order correlation analysis was conducted to examine the relationship between the frequency with which teachers mark learners' work and learners' satisfaction with the marking system. The results revealed a moderate, positive, and statistically significant correlation between the two variables ($\rho = .40$, $p < .001$). The positive correlation indicates that higher levels of teacher marking were associated with higher levels of learner satisfaction. In other words, learners who reported that their teachers marked their work more frequently were generally more likely to express satisfaction with the marking system used in mathematics classrooms. The statistically significant p-value suggests that this relationship is unlikely to have occurred by chance and reflects a meaningful association between teacher marking practices and learners' perceptions of assessment quality.

The magnitude of the correlation suggests a moderate relationship, indicating that while teacher marking frequency is an important factor influencing learner satisfaction, other factors may also contribute to learners' perceptions of the marking system. Frequent teacher marking may enhance satisfaction because it provides learners with regular feedback, helps them identify and correct errors, and demonstrates teacher engagement in their learning process. Learners may also perceive teacher-marked work as more accurate, credible, and beneficial for improving their mathematical understanding compared to other marking approaches. These findings support the view that active teacher involvement in assessment practices plays a significant role in shaping positive learner experiences and reinforces the importance of timely and consistent feedback in mathematics education.

Summary of Hypotheses Testing Results

To provide an overview of the hypotheses, the results of the hypothesis tests are summarized in Table 6. The analyses examined the relationships between learners' marking preferences, their perceptions of marking practices, grade level, mathematics achievement level, and satisfaction with the marking system. Overall, the findings indicate that, while learners' preferred marking strategy and grade level were not significantly associated with satisfaction or perceptions of marking practices, mathematics achievement level and the frequency of teacher marking were significantly associated with learners' perceptions and satisfaction with the marking system. A summary of the hypothesis-testing results is presented Table 6.

Table 6. Summary of Hypotheses Testing Outcomes

	Hypotheses	Result
H1:	Learners' preferred marking strategy is significantly associated with their satisfaction with the marking system	Not supported
H2:	Learners' perceptions of marking practices differ significantly across grade levels.	Not supported

	Hypotheses	Result
H3:	Learners' perceptions of marking practices differ significantly according to their mathematics achievement level.	Supported
H4:	The frequency of teacher marking is positively associated with learners' satisfaction with the marking system.	Supported

The qualitative findings provide additional insight into the statistical patterns observed in the quantitative analysis, particularly regarding learners' strong preference for teacher feedback and concerns about inconsistent marking practices.

Qualitative Results: Emerging Themes

RQ 5: What concerns or suggestions do learners express regarding the marking of informal mathematics tasks?

Qualitative responses from dissatisfied learners were analyzed thematically, revealing four major themes: inconsistent teacher marking, insufficient detailed feedback, overreliance on self- and peer-marking, and limited teacher support during correction activities. These themes highlight key areas for improvement in the marking experience for learners.

Theme 1: Inconsistent Teacher Marking

The most frequently reported concern related to inconsistent or limited teacher marking of learners' written work. Several learners indicated that classwork and homework books were not checked regularly, leading to uncertainty about the correctness of their work. For example, one learner stated that "it may take weeks without my book being marked" (S12), while another explained that the teacher "only checks 3–5 books out of a class of 46 learners" (S7).

Some learners further emphasized the importance of regular teacher monitoring of written work. One participant commented that "teachers should monitor learners' classwork books more frequently because sometimes we are lazy to write classworks and homeworks in our books" (S77), while another learner stated, "I will like the teacher to mark our books and give the general comment so that we can work better" (S8).

These responses suggest that some learners perceive irregular marking as limiting their opportunities to receive feedback, identify errors, and remain accountable for completing written tasks. The findings indicate that consistency in teacher marking is important for maintaining learner confidence, motivation, engagement, and participation in mathematics learning.

Theme 2: Lack of Detailed Feedback and Explanations

Another major theme concerned the lack of detailed explanations during marking and correction activities. Several learners reported that teachers often indicated correct or incorrect answers without adequately explaining mathematical procedures or demonstrating how errors could be corrected. One learner mentioned that "after marking we're not given clear methods to use when writing the work we've got wrong" (S6). Similarly, another learner stated that they would prefer the teacher to "explain how he got the answers before making corrections" (S4).

Some learners further expressed concerns that certain mathematical methods used during corrections were difficult to understand. For example, one participant commented that "the steps he often use are not easy to understand and sometimes find the methods difficult for our level" (S53).

These responses suggest that learners not only value corrective feedback but also require explanations that are accessible and appropriate to their level of understanding.

Overall, the findings highlight that learners value feedback that goes beyond simply identifying mistakes and instead provides guidance for improvement. Learners appeared to perceive explanatory feedback as essential for strengthening conceptual understanding, improving problem-solving skills, and developing confidence in mathematics learning.

Theme 3: Overreliance on Self- and Peer-Marking

A third theme that emerged from the data was learners' concern regarding the extensive use of self-marking and peer-marking practices. Although some learners acknowledged that these approaches may help them participate actively in assessment processes, several respondents felt that they were often required to mark work independently without sufficient teacher guidance. One learner explained that learners "copy corrections from the board and mark ourselves but are not shown how to correctly solve the questions" (S3).

Some learners, however, recognized positive aspects of self-marking. For example, one participant stated that "marking my own work helps me to assess the mistakes I have done and correct them which improves my skill" (S40), while another learner commented that "when I mark my own work it helps me to not make the same mistake" (S123). These responses suggest that self-marking may support reflection and error awareness when learners understand the correction process.

Nevertheless, the findings indicate that learners may question the effectiveness and reliability of self- and peer-marking when corrective explanations and teacher supervision are limited. The responses further suggest that while learners appreciate opportunities to participate actively in assessment processes, they still regard teacher involvement as important for ensuring accurate feedback, meaningful explanations, and effective learning support in mathematics classrooms.

Theme 4: Need for Supportive Teacher Guidance During Marking and Corrections

Some learners also expressed concerns about limited teacher attention and support during marking and correction sessions. Responses suggested that teachers were sometimes perceived as prioritizing quick corrections over ensuring that learners fully understood their mistakes and the mathematical procedures involved. Learners therefore recommended that teachers provide clearer explanations and spend additional time discussing errors and solution methods during feedback sessions.

Several learners emphasized the importance of supportive and patient teacher guidance during correction activities. For example, one learner stated that teachers should "always be patient with learners who find mathematics difficult because academically we can't be good in all the subjects" (S53). Another participant expressed a desire for more individualized support during feedback sessions, stating, "I would like to get helped in mathematics alone by my own teacher with kindness and understanding of my learning skills and without judgements" (S101).

Some learners further suggested that negative teacher attitudes during correction activities discouraged learners from seeking clarification about mistakes. One learner commented that

“teachers come to teach with negative attitude every time that makes learners feel grounded for asking questions” (S93).

This theme indicates that learners value supportive teacher–learner interactions during marking and correction processes and expect feedback practices to directly contribute to their understanding of mathematical concepts. The findings further suggest that learners perceive constructive, patient, and engaging feedback as important for promoting confidence and meaningful participation in mathematics learning.

Summary of Qualitative Findings

Overall, the qualitative findings indicate that learners value regular teacher marking, detailed explanatory feedback, supportive teacher engagement, and opportunities for revision and academic support. Although self-marking was commonly used and viewed positively by some learners, many participants still regarded teacher feedback as more reliable, supportive, and educationally meaningful. The themes emerging from the qualitative data, therefore, reinforce the quantitative findings, which show that frequent teacher marking and meaningful feedback are positively associated with learner satisfaction with the marking system.

Discussion

This study examined learners’ perceptions of marking practices for informal mathematics tasks in secondary school mathematics classrooms. The findings demonstrate that although self-marking was the most used assessment practice, learners generally preferred teacher marking and associated frequent teacher feedback with higher levels of satisfaction with the marking system. The results further reveal that learners value marking practices that provide consistent feedback, detailed explanations, and supportive teacher guidance during correction activities. These findings highlight important tensions between workload-driven classroom assessment practices and learners’ expectations for meaningful formative feedback in mathematics education.

Frequency of Teacher Marking and Marking Practices

The results of this study show that teacher marking of learners’ written work happens quite often in many classrooms. Many learners reported that their work was marked either often or always, indicating that teachers generally understand the importance of providing feedback on classwork and homework. These findings align with the principles of formative assessment, which emphasize the importance of ongoing feedback to support learning (Black & Wiliam, 2009; Wiliam, 2018). By marking regularly, teachers can spot learners’ misconceptions and give guidance to help improve their understanding of math concepts.

Nevertheless, a notable minority of learners reported that their work was rarely or never marked. This finding highlights the practical challenges associated with grading large volumes of written work in mathematics classrooms. Recent studies in South Africa have shown that teachers in many public secondary schools continue to experience heavy workloads due to large class sizes, overcrowded classrooms, and multiple teaching responsibilities (Graham, 2023; Köhler, 2022;

Tshangana et al., 2023). As a result, teachers may adopt alternative strategies, such as self-marking or peer-marking, to manage the demands of providing feedback.

At the same time, the qualitative findings indicate that learners may interpret infrequent teacher marking as a lack of instructional support and feedback accountability. Learners expressed frustration when written work remained unchecked for extended periods or when only a small proportion of books were reviewed. These responses suggest that learners associate teacher marking not only with the correction of errors, but also with teacher attention, academic support, and recognition of their effort. Within the framework of formative assessment, irregular marking may weaken learners' engagement with written mathematics tasks, as feedback opportunities may be perceived as inconsistent or insufficient.

The descriptive analysis of quantitative data showed that self-marking was the most common marking strategy used in mathematics classrooms, followed by teacher marking. Peer marking was less frequently reported. These results support earlier research highlighting the importance of self-assessment as a formative assessment method that encourages metacognitive awareness and learner independence (Panadero et al., 2019; Seifert & Feliks, 2019). When learners evaluate their own work, they often gain a deeper understanding of mathematical procedures and become more aware of typical errors.

Learners' Preferences for Marking Strategies

Despite widespread use of self-marking, the results show that most learners prefer teacher-marking for evaluating mathematics classwork and homework. This preference indicates that learners highly value feedback directly from their teachers. Teacher feedback may be perceived as more trustworthy and authoritative than feedback from self- or peer marking. These findings align with previous research showing that learners often view teacher feedback as more credible and helpful for improving academic performance (Brookhart, 2017; Hattie & Timperley, 2007). In mathematics education, teacher feedback can be especially important because it helps learners understand complex procedures and spot errors in problem-solving.

Nevertheless, the findings reveal an important contradiction between classroom practice and learner preference. Although self-marking was the most frequently used strategy, most learners still preferred teacher marking. The qualitative findings help explain this contradiction. Many learners perceived self-marking as beneficial for identifying mistakes, but also expressed concerns about limited teacher explanations and insufficient corrective guidance during self-marking activities. This suggests that learners may value self-assessment primarily when it is supported by active teacher involvement rather than used as a substitute for teacher feedback. The findings therefore support recent arguments that self-regulated learning practices are most effective when combined with teacher scaffolding and guided feedback processes (Lei & Lei, 2026; Monteiro & Passarinho, 2026).

Interestingly, the hypothesis test examining the relationship between preferred marking strategy and satisfaction with the marking system found no statistically significant association. This indicates that although learners might favor teacher marking, their satisfaction with the marking

system does not rely solely on the specific strategy used. Instead, it could be affected by other factors, such as the quality and frequency of feedback.

Differences in Learners' Perceptions Across Grade Levels and Achievement Levels

The analysis of differences in learners' perceptions across grade levels found no statistically significant variations. This indicates that learners at different grades generally perceive and interpret marking practices similarly. One possible reason is that marking practices are applied consistently across grade levels within schools, leading to fairly uniform experiences among learners.

In contrast, the analysis showed notable differences in how learners perceive marking practices by mathematics achievement level. Learners with higher achievement levels tended to have more positive views of marking practices compared to those with lower achievement levels. This supports previous research indicating that high-achieving learners are often better at interpreting and using feedback effectively (Hattie, 2012; Winstone & Carless, 2019). Learners with stronger academic backgrounds may be more able to benefit from feedback because they have the conceptual knowledge needed to apply corrective guidance. This finding may also reflect differences in feedback literacy among learners. Higher-achieving learners may possess stronger self-regulation and evaluative judgment skills, enabling them to interpret and apply feedback more effectively than lower-achieving learners. In contrast, learners experiencing academic difficulties may require more explicit explanations, scaffolding, and teacher guidance to benefit meaningfully from marking and correction activities. The qualitative findings reinforce this interpretation, as several learners requested slower explanations, clearer methods, and more individualized support during corrections.

This finding also aligns with feedback theory, which highlights that learners' ability to utilize feedback depends on their prior knowledge and self-regulation skills (Hattie & Timperley, 2007). Therefore, teachers might need to provide additional guidance and scaffolding when giving feedback to learners facing academic challenges.

Relationship Between Teacher Marking and Learner Satisfaction

One of the key findings of this study is the moderate positive correlation between how often teachers mark and learners' satisfaction with the marking system. Learners who experienced more frequent teacher marking were significantly more likely to report higher levels of satisfaction. This finding emphasizes the critical role of feedback in learning. According to feedback theory, timely and informative feedback helps learners understand their progress and find ways to improve (Hattie & Timperley, 2007; Winstone & Carless, 2019). When learners receive regular feedback, they are more likely to feel supported and stay engaged with their academic tasks. The findings suggest that teacher involvement remains central to learners' perceptions of effective assessment, even in classrooms where self-marking practices are widely implemented. Learners consistently associated teacher marking with clearer explanations, more reliable feedback, and greater confidence in the correction process. This finding is important because contemporary assessment policies increasingly encourage learner-centered assessment approaches such as self- and peer-assessment. While such approaches may promote learner autonomy and reflection, the present study suggests that

learners still perceive teacher feedback as essential for validating understanding and resolving misconceptions in mathematics learning.

Learners' Concerns and Suggestions Regarding Marking Practices

The qualitative findings provide important insight into why learners preferred teacher marking despite the widespread use of self-marking practices. Learners consistently emphasized the importance of regular teacher feedback, detailed explanations of errors, and supportive guidance during correction activities. Many learners perceived inconsistent marking practices as limiting opportunities to identify mistakes and improve mathematical understanding. These findings reinforce formative assessment theory, which emphasizes that feedback is most effective when it is timely, explanatory, and directly linked to learner improvement (Black & Wiliam, 2009; Hattie & Timperley, 2007).

The findings also highlight the importance of the quality of feedback rather than feedback frequency alone. Several learners expressed dissatisfaction when corrections focused only on indicating right or wrong answers without explaining mathematical procedures or reasoning. This suggests that learners value explanatory feedback that supports conceptual understanding rather than surface-level correction. Such findings align with recent discussions on feedback literacy, which emphasize that learners benefit most from feedback when they are able to interpret and meaningfully apply corrective guidance (Carless & Winstone, 2023).

Furthermore, the qualitative responses revealed that learners value supportive teacher–learner interactions during correction activities. Learners frequently associated patient explanations, respectful communication, and individualized guidance with more effective learning experiences. In contrast, negative teacher attitudes and rushed corrections appeared to discourage learners from seeking clarification about errors. These findings suggest that emotional and relational dimensions of feedback may influence how learners engage with marking practices in mathematics classrooms.

Theoretical and Practical Contributions

This study contributes to the growing body of research on formative assessment and feedback in mathematics education by examining learners' perceptions of marking practices for informal mathematics tasks. While previous studies have largely focused on teachers' perspectives or assessment policies, this study foregrounds learners' experiences as recipients of feedback and explores how marking practices influence their satisfaction, engagement, and understanding in mathematics classrooms. By integrating quantitative survey findings with qualitative learner responses, the study provides a more comprehensive understanding of how marking practices are experienced in secondary school mathematics education.

From a theoretical perspective, the findings support the principles of formative assessment, feedback theory, and self-regulated learning, which emphasize the importance of timely, meaningful, and supportive feedback in promoting learner engagement and improvement. The results particularly highlight the significance of regular teacher marking and explanatory feedback in shaping learners' satisfaction with assessment practices. At the same time, the findings contribute to ongoing debates

on learner-centered assessment approaches by showing that although self-marking may promote reflection and error awareness, learners still strongly value teacher involvement and guided feedback in the correction process.

From a practical perspective, the findings suggest that schools should consider developing clearer marking and feedback policies that balance meaningful learner support with the practical realities of teacher workload. The study further suggests that self-marking and peer-marking practices may be more effective when combined with structured teacher guidance, corrective explanations, and opportunities for learner engagement during feedback sessions.

Limitations and Recommendations for Future Research

Despite its contributions, this study has several limitations. First, it relied on self-reported data from learners, which may be influenced by personal perceptions and experiences. Future studies could supplement learner surveys with classroom observations or teacher interviews to gain a more comprehensive understanding of marking practices. Second, the sample was limited to learners from schools within a single circuit in one school district in South Africa. As a result, the findings cannot be generalized beyond the study's sample and geographical area. Future research could replicate the study in different regions or countries to assess whether similar patterns emerge across educational systems. Third, the study primarily examined learners' perceptions of marking practices rather than directly measuring their impact on academic achievement. Future research could explore how different marking strategies affect learners' learning outcomes and their understanding of mathematical concepts.

Another limitation of the study is the uneven distribution of participants across the participating schools. Although learners from multiple secondary schools participated in the survey, some schools contributed more respondents than others because of varying response rates during online data collection. As a result, the sample may represent the experiences of learners from certain schools better than others. While the study aimed to identify general patterns in learners' perceptions of marking practices, this uneven school representation might limit the extent to which the findings reflect marking practices across all schools in the Pietersburg Circuit. Future research could address this issue by using more balanced or stratified sampling methods to ensure a more even representation of learners from different schools.

CONCLUSION

This study examined learners' perceptions of marking practices for informal mathematics tasks in secondary schools. The findings indicate that although self-marking is widely used in mathematics classrooms, most learners prefer their work to be marked directly by teachers. The study further found that learners' satisfaction with the marking system is positively associated with the frequency of teacher marking, highlighting the importance of regular and meaningful teacher feedback in supporting learner engagement and understanding. Although learners' perceptions of marking practices did not differ significantly across grade levels, differences were observed according to mathematics achievement level, suggesting that learners' academic backgrounds may influence how

they interpret and respond to feedback. The qualitative findings further revealed that learners value consistent teacher marking, detailed explanatory feedback, supportive correction processes, and opportunities to discuss errors and solution methods.

The findings suggest that while self- and peer-marking may support learner participation, reflection, and self-regulation, regular teacher feedback remains central to learners' confidence, understanding, and engagement in mathematics learning. These findings therefore support the need for balanced marking approaches in which self- and peer-assessment complement, rather than replace, meaningful teacher involvement during feedback and correction activities. From a practical perspective, the study highlights the importance of developing clear school-level marking and feedback policies that promote consistency in marking informal mathematics tasks while also considering teachers' workload challenges. Schools and teachers should therefore consider assessment approaches that combine regular teacher feedback with structured learner participation in assessment processes. By improving the quality, consistency, and supportiveness of marking practices, educators may better promote learners' understanding, motivation, and participation in mathematics learning.

DECLARATION OF THE USE OF AI

During the preparation of this work, the authors used Grammarly to assist with language editing, grammar correction, and the enhancement of the manuscript's clarity and coherence to ensure it met academic writing standards. After using this tool, the authors reviewed and edited the content as needed. The authors take full responsibility for the content of the published article.

ACKNOWLEDGEMENT

The authors sincerely thank the learners who participated in this study and generously shared their experiences and views on marking practices in mathematics classrooms. They also appreciate the Limpopo Department of Education and the principals of the participating secondary schools in the Pietersburg Circuit of the Capricorn South District for allowing the study to take place. Special thanks are given to the mathematics teachers who helped distribute the online survey to learners, which made data collection possible. Their cooperation and support were crucial for the successful completion of this research.

REFERENCES

Andrade, H. L., & Brookhart, S. M. (2020). Classroom assessment as the co-regulation of learning. *Assessment in Education: Principles, Policy & Practice, 27*(4), 350–372. https://doi.org/10.1080/0969594X.2019.1571992

Biton, Y. (2025). Student reflections on peer assessments: Benefits and challenges in a mathematics class. *European Journal of Educational Research, 14*(3), 1–15. https://doi.org/10.22521/edupij.2025.14.3

Black, P., & Wiliam, D. (2009). Developing the theory of formative assessment. *Educational Assessment, Evaluation and Accountability, 21*(1), 5–31. https://doi.org/10.1007/s11092-008-9068-5

Brandmo, C., & Gamlem, S. M. (2025). Students' perceptions and outcome of teacher feedback: A systematic review. *Frontiers in Education, 10*, 1572950. https://doi.org/10.3389/feduc.2025.1572950

Brookhart, S. M. (2017). *How to give effective feedback to your students.* Alexandria, VA: ASCD.
Brown, B., King, S., & Chatterton, S. (2021). *Cambian Policy and Procedure on Marking: Brook View School Policy No. 87.03.* Lancashire: Cambian Group. https://www.cambiangroup.com/media/2414148/8703-Marking-Policy-dec-2021.pdf
Carless, D., & Winstone, N. (2023). Teacher feedback literacy and its interplay with student feedback literacy. *Teaching in Higher Education, 28*(1), 150–163. https://doi.org/10.1080/13562517.2020.1782372
Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches.* Thousand Oaks, CA: Sage Publications.
Fleckney, P., Thompson, J., & Vaz-Serra, P. (2025). Designing effective peer assessment processes in higher education: a systematic review. *Higher Education Research & Development, 44*(2), 386–401. https://doi.org/10.1080/07294360.2024.2407083
Graham, M. A. (2023). Overcrowded classrooms and their association with South African learners' mathematics achievement. *African Journal of Research in Mathematics, Science and Technology Education, 27*(2), 169–179. https://doi.org/10.1080/18117295.2023.2244217
Hattie, J. (2012). *Visible learning for teachers: Maximizing impact on learning.* Routledge.
Hattie, J., & Timperley, H. (2007). The Power of Feedback. *Review of Educational Research, 77*(1), 81–112. https://doi.org/10.3102/003465430298487
Haynes, S. N., Richard, D. C., & Kubany, E. S. (1995). Content validity in psychological assessment: A functional approach to concepts and methods. *Psychological Assessment, 7*(3), 238–247. https://doi.org/10.1037/1040-3590.7.3.238
Heritage, M., & Wylie, E. C. (2020). *Formative assessment in the disciplines: Framing a continuum of professional learning.* Cambridge, MA: Harvard Education Press.
Jansen, B. R., Hofman, A. D., Savi, A., Visser, I., & van der Maas, H. L. (2016). Self-adapting the success rate when practicing math. Learning and Individual Differences, 51, 1–10. https://doi.org/10.1016/j.lindif.2016.08.027
Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A. (2007). Toward a Definition of Mixed Methods Research. *Journal of Mixed Methods Research, 1*(2), 112–133. https://doi.org/10.1177/1558689806298224
Kanjee, A., Roberts, N., Sadeck, O., & Ramollo, J. (2022). Entrenching performativity or enhancing pedagogy: Addressing the challenge of assessment policy and practice. *Journal of Education*(87), 1–23. https://doi.org/10.17159/2520-9868/i87a01
Köhler, T. (2022). Class size and learner outcomes in South African schools: The role of school socioeconomic status. *Development Southern Africa, 39*(2), 126–150. https://doi.org/10.1080/0376835X.2020.1845614
Lei, W., & Lei, Z. (2026). Formative assessment literacy: a systematic review. *Language Testing in Asia, 16*(1), 7. https://doi.org/10.1186/s40468-025-00418-0
León, S. P., Vallejo, A. P., & Nelson, J. B. (2021). Variability in the Accuracy of Self-Assessments Among Low, Moderate, and High-Performing Students in University Education. *Practical Assessment, Research, and Evaluation, 26*(1), 16. https://doi.org/10.7275/6q91-az58
Liebenow, L. W., Schmidt, F. T., Meyer, J., & Fleckenstein, J. (2025). Self-assessment accuracy in the age of artificial Intelligence: Differential effects of LLM-generated feedback. *Computers & Education, 237*, 105385. https://doi.org/10.1016/j.compedu.2025.105385
Mhlanga, M., Matsepe, D., & Maluleke, M. (2026). Understanding Quality Assessment In School-Based Assessment In The History FET Phase: Towards Theory Of Pedagogic Devices. *Journal of Sustainable Development Law and Policy, 17*(2), 125–141. https://doi.org/10.4314/jsdlp.v17i2.6
Monteiro, V., & Passarinho, B. B. (2026). Formative assessment and self-regulated learning in lower secondary mathematics: Students' and teachers' perceptions. *Education Sciences, 16*(3), Article 452. https://doi.org/10.3390/educsci16030452
National Centre for Excellence in the Teaching of Mathematics. (2016). *Guidance on Marking and Feedback for Secondary Mathematics Teaching.* Sheffield: NCETM. https://www.ncetm.org.uk/media/gkaldkso/secondary-marking-guidance-october-2016-v2.pdf
Niyibizi, O., & Mutarutinya, V. (2024). Enhancing learning outcomes in mathematics education through innovative assessment methods and timely feedback. *Journal of Mathematics and Science Teacher, 4*(3), em064. https://doi.org/10.29333/mathsciteacher/14584
OECD. (2020). *TALIS 2018 results (Volume II): Teachers and school leaders as valued professionals.* Paris: OECD Publishing. https://doi.org/10.1787/19cf08df-en
OECD. (2023). *PISA 2022 Results (Volume II): Learning During – and From – Disruption, PISA.* Paris: OECD Publishing. https://doi.org/10.1787/a97db61c-en

OECD. (2024). *PISA 2022 results (Volume V): Learning strategies and attitudes for life.* Paris: OECD Publishing. https://doi.org/10.1787/c2e44201-en
Ortega-Ruipérez, B., & Correa-Gorospe, J. M. (2024). Peer assessment to promote self-regulated learning with technology in higher education: Systematic review for improving course design. *Frontiers in Education, 9*, 1376505. https://doi.org/10.3389/feduc.2024.1376505
Panadero, E., Broadbent, J., Boud, D., & Lodge, J. M. (2019). Using formative assessment to influence self-and co-regulated learning: the role of evaluative judgment. *European Journal of Psychology* of Education, 34(3), 535–557. https://doi.org/10.1007/s10212-018-0407-8
Power, J. R., & Tanner, D. (2023). Peer assessment, self-assessment, and resultant feedback: an examination of feasibility and reliability. *European Journal of Engineering Education, 48*(4), 615-628. https://doi.org/10.1080/03043797.2023.2185769
Seifert, T., & Feliks, O. (2019). Online self-assessment and peer-assessment as a tool to enhance student-teachers' assessment skills. *Assessment & Evaluation in Higher Education, 44*(2), 169–185. https://doi.org/10.1080/02602938.2018.1487023
Taber, K. S. (2018). The use of Cronbach's alpha when developing and reporting research instruments in science education. *Research in science education, 48*(6), 1273–1296. https://doi.org/10.1007/s11165-016-9602-2
Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education, 2*, 53–55. https://doi.org/10.5116/ijme.4dfb.8dfd
Terada, Y., & Merrill, S. (2024, November 8). *Why teachers should grade less frequently.* Retrieved from Edutopia: https://www.edutopia.org/article/why-teachers-should-grade-less-frequently/
Tshangana, T., Nomtshongwana, P., & Buka, S. (2023). Teaching experiences with overcrowded classrooms in primary schools in the OR Tambo Coastal District of South Africa. *E-Journal of Humanities, Arts and Social Sciences, 4*(8), 1067–1078. https://doi.org/10.38159/ehass.2023483
Wanner, T., & Palmer, E. (2018). Formative self-and peer assessment for improved student learning: the crucial factors of design, teacher participation and feedback. *Assessment & Evaluation in Higher Education, 43*(7), 1032–1047. https://doi.org/10.1080/02602938.2018.1427698
Wiliam, D. (2018). Assessment for learning: meeting the challenge of implementation. *Assessment in Education: Principles, Policy & Practice, 25*(6), 682–685. https://doi.org/10.1080/0969594X.2017.1401526
Winstone, N., & Carless, D. (2019). *Designing Effective Feedback Processes in Higher Education: A Learning-Focused Approach.* London, UK: Routledge.
Wisniewski, B., Zierer, K., & Hattie, J. (2020). The Power of Feedback Revisited: A Meta-Analysis of Educational Feedback Research. *Frontiers in Psychology, 10*, 487662. https://doi.org/10.3389/fpsyg.2019.03087
Yan, Z., Lao, H., Panadero, E., Fernández-Castilla, B., Yang, L., & Yang, M. (2022). Effects of self-assessment and peer-assessment interventions on academic performance: A meta-analysis. *Educational Research Review, 37*, 100484. https://doi.org/10.1016/j.edurev.2022.100484
Yang, C., Hou, S., & Chen, J. (2025). Enhancing interpreting performance, engagement, and self-regulated learning through peer assessment: An attachment theory perspective. *Frontiers in Psychology, 16*, 1604825. https://doi.org/10.3389/fpsyg.2025.1604825
Yongtao, G. (2025). Impact of Workload on the Performance of Junior High School Teachers Under China's "Double Reduction" Policy. *SAGE Open, 15*(3). https://doi.org/10.1177/21582440251345577
Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory into practice, 41*(2), 64–70. https://doi.org/10.1207/s15430421tip4102_2