Evaluating an AI-Powered Learning Analytics Tool for Automated Essay Scoring in Real Classroom Contexts: An Experience Report from a Brazilian Public Secondary School

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Abstract. *This experience report, drawn from firsthand classroom practice, presents teachers' perceptions, opinions, and experiences regarding the adoption of the Escreva Mais, an Artificial Intelligence (AI)-powered Learning Analytics (LA) tool designed for low-resource educational settings and essay assessment. The proposed experience report was conducted in a Brazilian secondary school and involved an essay teacher and a pedagogical coordinator. Both stakeholders adopted the solution through a complete essay assessment and feedback cycle involving thirty-five students. The qualitative findings highlight the Escreva Mais tool pedagogical benefits, perceived usefulness, reliability, performance, and potential contributions to student learning.*

1. Introduction

Feedback is widely recognized as a fundamental process for learning, particularly when improving writing ability, as it allows students to develop the capacity to interpret their texts and act upon them to achieve effective results [Dawson et al. 2021]. In the context of essay assessment, constructive feedback is essential for guiding students through the complexities of writing production and revision cycles. However, providing timely, personalized feedback remains a challenge for teachers.

With the advancement of Artificial Intelligence in Education (AIED), innovative solutions such as Intelligent Tutoring Systems (ITS) have emerged [Stamper et al. 2024], leveraging Large Language Models (LLMs) and data analysis to provide personalized and instant feedback. These tools not only might enhance student outcomes but also enrich pedagogical practices by automating assessments and offering personalized support for teaching activities [Chan et al. 2024]. Despite that, their implementation in resource-

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constrained regions, especially in the global south, faces challenges due to limited technological resources and infrastructure, such as unstable internet access and limited computers availability [Rodrigues et al. 2025].

In that context, the concept of AIED Unplugged (AIED-U) emerges, proposing solutions that do not depend on constant connectivity and can be integrated into existing resources, such as paper-based activities, to democratize access to educational innovations without requiring massive investments in infrastructure [Isotani et al. 2023]. Nevertheless, for these solutions to be effective, their support for feedback processes must be grounded in real-world use and continuously seek improvements from users themselves. The importance of adjusting this process with teachers is essential, as they are the main guiders of how to build well-structured feedback based on the class context to ensure these solutions are technically accurate and capable of guiding the student in identifying knowledge gaps without simply giving away the solution [Pahi et al. 2024]. Thus, the evolution of these tools depends on a continuous cycle of evaluation that ensures the technology aligns with students' pedagogical and contextual needs.

Therefore, this experience report presents the use of the *Escreva Mais* tool in an authentic educational setting, as well as an evaluation of its pedagogical adequacy and contributions to teaching practices from the perspective of these teachers. The tool, proposed in [Mello et al. 2026], integrates AI-powered Learning Analytics into low-resource educational settings, aiming to reduce teacher workload and provide timely student feedback. Based on the AIED-U paradigm, *Escreva Mais* provides analytical reports to support writing development, essay evaluation, and feedback practices. By exploring evaluations of instructional support, usability, and pedagogical acceptance through semi-structured interviews and thematic analysis, this experience report provides insights into the tool's applicability and its potential to support teachers' assessment practices in under-resourced environments. The results highlight the *Escreva Mais* contributions to the daily demands of schools, basic education, and secondary education contexts. Considering the adoption of the *Escreva Mais* tool for automated essay assessment and feedback, participants emphasized its quality, adequacy, reliability, intuitiveness, and usefulness in supporting student learning. Moreover, teachers confirmed the *Escreva Mais* potential to address common classroom constraints by reducing workload, improving teaching practices, and supporting more effective time management throughout the academic semester.

2. Literature Review

Writing skills affect learners' academic performance, cognitive development, and future professional success. However, students from several countries still face substantial challenges in developing strong writing abilities [PISA 2023]. One of the most effective strategies for addressing these challenges is the provision of timely and constructive feedback, which helps learners identify errors, understand writing conventions, and engage in iterative improvement [Graham et al. 2024, Fleckenstein et al. 2023]. Additionally, LA offer powerful tools to monitor students' writing progress by visualizing performance patterns to identify areas for intervention [Hooshyar et al. 2024].

Nevertheless, scoring writing productions and designing personalized interventions by hand is laborious and time-consuming for teachers, especially in crowded classrooms, highlighting the importance of AIED systems [PISA 2023]. The study proposed

in [Ferman et al. 2023] investigates the impact of AIED in Brazilian secondary schools by evaluating the effects of AI-based systems for scoring essays written for the ENEM examination. As results, the authors highlight that AIED integration enabled more frequent individualized feedback for students, as well as improvements in students' essay scores. More recently, [Florentino et al. 2026] highlight that, although Brazilian teachers recognize the pedagogical potential of AIED, its adoption in public schools is still challenged by issues related to technological infrastructure, unequal access, lack of teacher training, ethical concerns, and the need for context-sensitive educational implementations.

AIED systems can semi-automate writing assessment, reducing teacher workload and enhancing the precision and consistency of instructional decisions [Hooshyar et al. 2024]. However, accessing these benefits depends heavily on the availability of technological infrastructure, including devices and internet connectivity, as well as foundational, instructional, and operational training for educational stakeholders [Isotani et al. 2023].

Given these challenges, AIED-U solutions have been developed within the context of the Brazilian educational system. [Isotani et al. 2023] proposed a mobile unplugged application designed to support Brazilian students' writing skill development, which captures students' handwritten essays on paper sheets containing QR codes and specific markings, automatically transcribing and analyzing their content. Also following the AIED-U principles, research describes the development of a similar solution for the automatic evaluation of mathematics tasks [Rodrigues et al. 2024b, Rodrigues et al. 2024a]. As a contribution, [Rodrigues et al. 2024a] presents a qualitative evaluation of the proposed solution, highlighting how Brazilian mathematics teachers perceive and adopt the tool.

Thus, beyond the development of educational technologies themselves, it is essential to design solutions that are sensitive to local realities, pedagogical and institutional demands, and the structural limitations of Brazilian public schools, while simultaneously promoting teacher training and AI literacy initiatives among educational stakeholders.

3. Method

This study aims to investigate teachers' perceptions, experiences, and evaluations regarding the adoption of the *Escreva Mais* tool for automated essay assessment and feedback in authentic educational settings [Mello et al. 2026]. The experience report and real classroom context implementation took place in a public secondary school located in the municipality of [omitted], in the state of [omitted], Brazil. The school belongs to the state public education system, offers both elementary and secondary education.Participants teach across different educational levels within the school. For this study, the *Escreva Mais* tool was integrated into essay-writing, assessment, and feedback activities conducted with students from the second and third years of secondary education.

3.1. Sampling and Participants

This study involved two educational stakeholders who contributed different professional perspectives regarding the adoption of the *Escreva Mais*. Participant *P1* contributed from an educational management perspective, focusing on integrating the solution into school workflows and assessment practices. Participant *P2* evaluated the tool from a classroom real teaching perspective.

Both participants were male, reported frequent use of digital applications in educational contexts, indicated familiarity with technological tools for teaching support, and good internet access and personal digital device. *P1* had ten years of teaching experience and worked exclusively at the current institution, while *P2* had between three and five years of teaching experience and worked in multiple schools.

3.2. Study Procedure

To collect the teachers experience, this study adopted a qualitative approach based on semi-structured interviews. The interviews followed predefined questions aimed at understanding participants' perceptions regarding the potential of the *Escreva Mais* tool to enhance essay scoring, feedback generation, and assessment practices in educational settings.

During the first phase of the evaluation, participants used the *Escreva Mais* tool in line with their professional roles (teaching or management) and pedagogical needs. *P1*, acting from a pedagogical coordination and school management perspective, conducted a more punctual evaluation of previously available student essays to analyze the practical relevance, usability, and applicability of the tool within school assessment workflows and pedagogical management activities. On the other hand, *P2* implemented a complete essay assessment and feedback cycle with approximately 35 secondary school students as part of his regular instructional routine, using a writing prompt defined according to classroom instructional demands. Throughout this cycle, the participant used the tool for automated essay scoring, pedagogical report generation, and feedback practices.

Afterwards, both participants took part in two-hour virtual recorded meetings and semi-structured interviews focused on the tool's practical contributions, usability, limitations, and pedagogical applicability. All participants provided informed consent, and the study protocol was reviewed and approved by the relevant institutional review board (CAAE: [REMOVED FOR REVIEW]).

3.3. Data Analysis

To analyze the interview data, this study employed Thematic Analysis to identify the main themes and subthemes emerging from the transcriptions of the semi-structured interviews. These interviews reflect both administrative management perspectives and teachers' viewpoints. As detailed below, this analysis was based on the five-phase process proposed by [Braun and Clarke 2006, Braun and Clarke 2012, Shoufan 2023]:

1. **Examining and Familiarizing with the Data**: A researcher from the team read the complete content from the interview in order to become more familiar with the data, its correlations and to understand and highlight important items and participants' perceptions.
2. **Generating initial codes:** In this step, the researcher started rationalize about meaningful codes of the transcriptions. Afterwards, following the approach proposed by [Shoufan 2023], we used the Taguette tool to digitally annotate and code relevant excerpts from the interview data. Taguette is a free, collaborative, and open-source qualitative research tool that allows users to create codes by highlighting words, sentences, or paragraphs. All codes were carefully and iteratively analyzed and refined until they became well-defined, coherent, and conceptually consistent with one another.

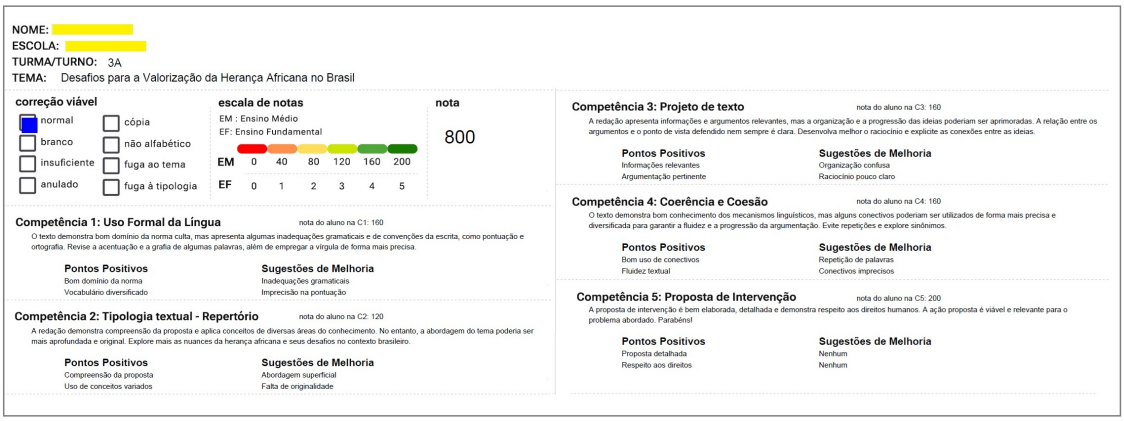
3. **Searching and defining themes:** In this phase, the researcher iteratively reviewed all generated codes, manually examined potential relationships among them, and identified preliminary themes that captured shared patterns of meaning across the dataset.
4. **Reviewing and naming themes:** Finally, the researcher evaluated whether any themes should be merged, refined, or divided into more specific themes. The themes were then defined and named (or renamed) to ensure clarity, coherence, and an accurate representation of their underlying meaning.
5. **Interpreting and reporting the findings:** In the final phase, the researcher interpreted the identified themes and their relationships in light of the study objectives and the educational context in which the *Escreva Mais* tool was adopted.

4. Results

4.1. Tool Usage in the Classroom Scenario

The *Escreva Mais* was used by P2 to score 35 students' essays during a complete writing and assessment cycle. This section narrates that experience as it unfolded across the school's regular assessment calendar. The essay topics explored by teachers and students addressed issues related to digital inclusion in Brazil, the impact of social media on young people's mental health, the international day for disaster risk reduction, and the challenges of valuing African heritage in Brazil.

After students finalized their essays, teachers initiated the grading process by photographing each essay using the *Escreva Mais* tool. Afterwards, they received the grading results at two levels: (i) a concise on-device summary of class performance and (ii) a detailed PDF report sent by email containing specific scores for the competencies defined by ENEM (Figure 1). This dual reporting format accommodates different teacher needs and digital skill levels, aligning with the AIED-U's principle of minimal digital skills [Isotani et al. 2023]. Based on these scores and competency-oriented recommendations, teachers may identify competencies that require greater pedagogical attention, such as those presenting very low scores and demanding additional scaffolding, guidance, and instructional support. Furthermore, the reports also enable teachers to recognize areas in which students demonstrate more developed skills and stronger performance.


NOME:
ESCOLA:
TURMA/TURNO: 3A
TEMA: Desafios para a Valorização da Herança Africana no Brasil

correção viável
normal
branco
insuficiente
anulado
cópia
não alfabético
fuga ao tema
fuga à tipologia

escala de notas
EM : Ensino Médio
EF: Ensino Fundamental
EM 0 40 80 120 160 200
EF 0 1 2 3 4 5

nota
800

Competência 1: Uso Formal da Língua — nota do aluno na C1: 160
O texto demonstra bom domínio da norma culta, mas apresenta algumas inadequações gramaticais e de convenções da escrita, como pontuação e ortografia. Revise a acentuação e a grafia de algumas palavras, além de empregar a vírgula de forma mais precisa.
Pontos Positivos: Bom domínio da norma; Vocabulário diversificado
Sugestões de Melhoria: Inadequações gramaticais; Imprecisão na pontuação

Competência 2: Tipologia textual - Repertório — nota do aluno na C2: 120
A redação demonstra compreensão da proposta e aplica conceitos de diversas áreas do conhecimento. No entanto, a abordagem do tema poderia ser mais aprofundada e original. Explore mais as nuances da herança africana e seus desafios no contexto brasileiro.
Pontos Positivos: Compreensão da proposta; Uso de conceitos variados
Sugestões de Melhoria: Abordagem superficial; Falta de originalidade

Competência 3: Projeto de texto — nota do aluno na C3: 160
A redação apresenta informações e argumentos relevantes, mas a organização e a progressão das ideias poderiam ser aprimoradas. A relação entre os argumentos e o ponto de vista defendido nem sempre é clara. Desenvolva melhor o raciocínio e explicite as conexões entre as ideias.
Pontos Positivos: Informações relevantes; Argumentação pertinente
Sugestões de Melhoria: Organização confusa; Raciocínio pouco claro

Competência 4: Coerência e Coesão — nota do aluno na C4: 160
O texto demonstra bom conhecimento dos mecanismos linguísticos, mas alguns conectivos poderiam ser utilizados de forma mais precisa e diversificada para garantir a fluidez e a progressão da argumentação. Evite repetições e explore sinônimos.
Pontos Positivos: Bom uso de conectivos; Fluidez textual
Sugestões de Melhoria: Repetição de palavras; Conectivos imprecisos

Competência 5: Proposta de Intervenção — nota do aluno na C5: 200
A proposta de intervenção é bem elaborada, detalhada e demonstra respeito aos direitos humanos. A ação proposta é viável e relevante para o problema abordado. Parabéns!
Pontos Positivos: Proposta detalhada; Respeito aos direitos
Sugestões de Melhoria: Nenhum; Nenhum

Figure 1. Example of the PDF Report Generated by the *Escreva Mais*.

Figure 2 presents a descriptive analysis of real students' average scores (from 0 to 200 points) across the five evaluated ENEM competencies, as well as the overall average score (from 0 to 1000 points). *P2* used the generated analytics reports during classroom activities to discuss recommendations with students, highlighting strengths and areas for revision before starting a new essay revision cycle. In contrast, *P1* used the *Escreva Mais* reports to provide broader insights regarding the adoption and pedagogical applicability of the tool in educational contexts.

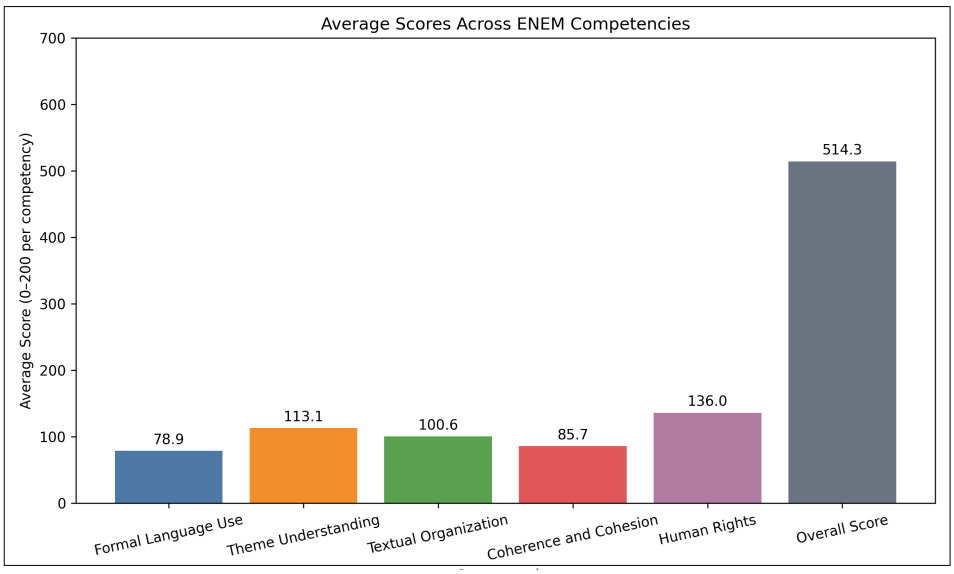


Figure 2. Average of the Students Grading by *Escreva Mais*.

4.2. Themes, Categories, and Perceptions Emerging from Teachers' Usage and Interviews

As detailed in Section 3.3, the qualitative analysis was guided by the principles of Thematic Analysis (TA) [Clarke and Braun 2016], particularly its emphasis on coding and the development of broader themes. Figure 3 demonstrates that the TA yielded two main themes and twelve sub-themes related to teachers' perspectives on the *Escreva Mais* tool. The theme Pedagogical and Functional Benefits (upper higher-order theme) describes teachers' perspectives and positive opinions regarding the usability, usefulness, reliability, learning impact, and pedagogical contributions of *Escreva Mais*. In contrast, the theme Limitations and Improvement Needs (lower higher-order theme) covers teachers' suggestions for improving specific features and for future tool extensions and development.

Due to space limitations, the complete mapping of codes to their respective themes and subthemes is provided in the supplementary material[1]. The following comments express *P1* and *P2* of pedagogical contributions, usability and acceptability[2]:

C1-P1: "These are relevant pieces of information because, as a pedagogical coordinator, you are necessarily required to review all assessments conducted within the school."

[1] `https://tinyurl.com/WIE2026-OSF`

[2] To access the original version (Brazilian Portuguese) of the participants' comments (C1-C23), please refer to our supplementary material available at `https://tinyurl.com/WIE-OSF`.

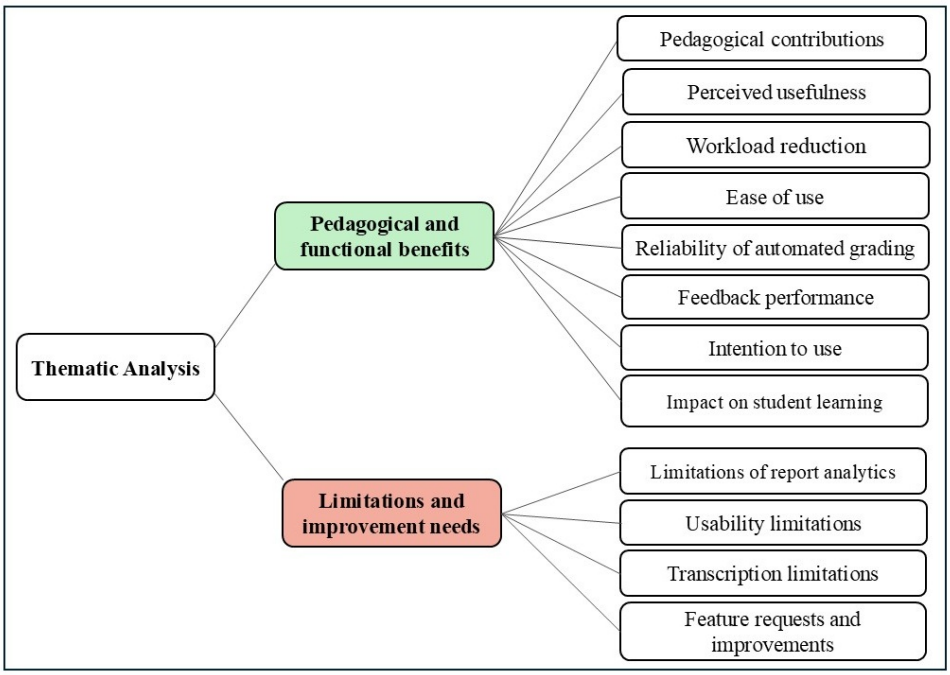


Figure 3. Thematic map derived from the analysis of semi-structured interviews, illustrating themes emerging from teachers' experiences with the *Escreva Mais* tool.

C2-P1: "I found it very intuitive and, personally, I did not experience difficulties using it, especially because I do not usually have technological difficulties."

C3-P2: "Everything is very didactic and easy to use. *Escreva Mais* functions are very clear and straightforward."

C4-P1: "*Escreva Mais* tool meets my expectations, especially regarding the daily demands of schools, basic education, and secondary education. It works really well."

C5-P2: "Without a doubt, the ability to scan the document is extremely useful because it significantly speeds up my work."

C6-P1 : "I would actually use the application in my daily school activities, especially for working with argumentative essays and writing instruction, the *Escreva Mais* tool is even more helpful than the government's own platform."

C7-P2 "I would also use the generated reports for individual student monitoring, particularly to track students' progress and learning deficits."

As observed in comments C8-C13 the participants reported positive perceptions regarding the perceived usefulness, real-time and high-quality feedback, and grading reliability of *Escreva Mais*. The following teachers' perceptions strengthen the evidence of the *Escreva Mais* tool capabilities to support pedagogical decision-making and authentic essay assessment practices. Furthermore, participants highlighted the tool's potential to increase teachers' instructional capacity while reducing workload and the effort required to assess, evaluate, and provide timely feedback on students' essays.

C8-P1: "I really liked the guidance provided by the camera during the image capture process. I think that was extremely well designed. For me, this functionality is excellent and practically flawless."

C9-P2: "Without a doubt, the ability to scan the document is extremely useful because it significantly speeds up the work process."

C10-P1: "At certain moments, I believe that individual monitoring becomes more precise. What I would use the most is the possibility of analyzing the student's performance across each competency."

C11-P1: "The student writes the essay, submits it to me, and then I am already able to follow essay assessment cycle performing the correction, and following the student's development immediately."

C12-P2: "Regarding the reliability of the platform, without a doubt, it is very good. For me, the platform would work very well as an official correction system."

C13-P1: "Then I used the platform to verify whether the grading system would actually match my own correction process. And it did, it matched perfectly with the grading."

Another important contribution of the proposed solution is highlighted in comments C14-C15. According to participants' reports, the tool provides comprehensive, detailed analytical reports quickly and efficiently, which may help reduce teachers' daily workload while supporting student learning. These contributions demonstrate the potential impact of the tool on teaching practices by enabling faster feedback generation, reducing grading time and workload, increasing instructional capacity, and supporting a higher volume of essay production.

C14-P1: "Working with argumentative essays is extremely exhausting for teachers. If I usually worked with four argumentative essay assignments per year, by using the *Escreva Mais* tool I would probably be able to work with eight."

C15-P2: "Since teachers' work revolves around time, we need enough time to properly grade assignments and perform high-quality instructional work. From a teacher's perspective, I can say that the assessment correction process is the main aspect in which the tool would be most useful."

Considering the theme Limitations and improvement needs, the participants suggested several improvements, requirements, and adaptations for the *Escreva Mais* tool. The reported limitations were mainly related to report analytics, usability issues, and requests for additional functionalities and feature expansions. Regarding the limitations of report analytics, participant *P1* highlighted difficulties in interpreting global reports and suggested the inclusion of additional visual resources, such as charts, graphical representations, and overall student performance indicators to improve readability and monitoring processes.

- C16-P1: "On the home page displaying the list of schools, we become a little confused when trying to understand the overall results. If there were more graphs, it would be easier to interpret."
- C17-P1: "I missed having more graphs, but I still need to spend more time exploring the *Escreva Mais* tool properly. There are moments when I want to see the individual feedback and progress of a student and perhaps even visualize a graph showing the student's development across different writing assignments. At other times, I may want to see an overall graph of my class."
- C18-P1: "It would also be interesting if I could obtain the class average score, because this would provide teachers with additional information to better understand the overall results together with each student's individual average score."

The participants also provided suggestions for improvement and feature requests for future versions of the tool. One major request was to support additional textual genres beyond narrative essays, thereby expanding the pedagogical applicability of the platform.

- C19-P1: "I am thinking here, honestly, if in the future the *Escreva Mais* could support other textual genres, that would be revolutionary."
- C20-P2: "Is it possible to choose, for example, whether I want to work with genres such as poems or letters? Does the platform provide this option?"

Another relevant requirement suggested by the participants was the implementation of an automatic student registration process to reduce teachers' workload and the time required for manual class organization. In addition, as noted in comment C20-P2, one participant suggested that the possibility of uploading external resources during essay registration could facilitate teachers' workflow and instructional practices.

- C21-P1: "What I think needs to be reconsidered is the inclusion of students' names, because this is something that requires work and time that teachers simply do not have. In real school contexts, ideally, we want everything ready and simplified."
- C22-P2: "Writing students' full names and assigning them to classes, no, for me that is not feasible."
- C23-P2: "I would like to be able to attach, for example, a link to a supporting text (theme description), not necessarily upload the document itself, but perhaps attach a public Google Drive link so that the platform could retrieve the document from there."

5. Discussion

Recent studies highlighted the potential of LLM-based educational solutions to enhance writing instruction and promote more equitable learning opportunities in low-resource educational contexts [Xavier et al. 2025, Mello et al. 2026]. Furthermore, previous studies have emphasized the importance of evaluating educational technologies in authentic educational settings, since real-world deployments and empirical evaluations help identify contextual requirements, validate pedagogical assumptions, and refine technological solutions according to the needs and practices of their intended users [Nazaretsky et al. 2022, Seßler et al. 2023].

This study provides empirical evidence on how unplugged AI-powered LA solutions can enhance the feedback loop in resource-constrained contexts by addressing gaps identified in prior literature on both AIED-U and LA in writing [Isotani et al. 2023, Shibani et al. 2019]. The participants provided important considerations regarding the pedagogical, functional, and practical contributions of our unplugged AI-powered LA solution. Both participants highlighted the pedagogical contributions of the tool and expressed their acceptance and intention to integrate it into their classroom practices.

This study expands previous literature [Isotani et al. 2023] by evaluating an AIED-U solution in an authentic classroom context while considering the perspectives of its primary educational stakeholders, namely teachers and school administrators. Rather than focusing exclusively on system performance, the study investigates how these stakeholders perceive the pedagogical value of the tool based on students' real usage, essay

assessment results, and the automated feedback and analytics reports generated by the system. Furthermore, this study extends previous AIED-U applications in Brazilian mathematics education [Rodrigues et al. 2024b, Rodrigues et al. 2024a] by investigating teachers' experiences in writing instruction and automated essay assessment while addressing the specific pedagogical and assessment requirements of the ENEM examination.

Beyond the perceived benefits, limitations, and improvement suggestions, it is important to emphasize that the proposed solution may enhance teaching practices by providing multiple instructional capabilities through analytical reports. These reports separately assess each essay competency, provide individualized suggestions for improvement, and present the scores students obtained. Overall, the *Escreva Mais* tool optimizes feedback processes by reducing grading time, enabling students to upload handwritten essays, approximating the platform to formal national assessment formats, and allowing teachers to assign more essays or conduct multiple revision and improvement cycles for the same written production.

6. Final Considerations

The qualitative analysis and reflections presented in this study highlight how the contributions of the *Escreva Mais* tool for essay scoring and automated feedback may positively affect and contribute to Brazilian secondary schools. The proposed research also emphasizes the degree of adequacy of the solution for teaching practices and authentic pedagogical contexts as directly experienced and reported by the participating teachers. Overall, the participants considered our unplugged AI-powered LA solution relevant and applicable to their educational practices. Furthermore, the findings highlight the potential of AI-powered Learning Analytics solutions to support teachers' assessment practices, reduce workload, and provide more individualized and timely feedback for students. Based on this qualitative analysis, a set of design requirements emerged, reflecting immediate pedagogical and practical demands observed in authentic teaching contexts.

Although the thematic analysis was grounded in teachers' perceptions of the tool's reliability, usefulness, and performance during the evaluation of essays produced by 35 secondary school students, the findings of this study should be interpreted with some limitations in mind. First, the small sample of high-school teachers limits the generalizability of the results to broader educational contexts and teacher populations. Second, the qualitative coding process was conducted by a single moderator, supported by a literature-grounded AI-enhanced procedure. Although the analysis followed systematic procedures, the absence of multiple independent human coders prevents the estimation of inter-rater reliability measures. Third, further longitudinal and performance-based studies are necessary to better evaluate the impact of the proposed solution on students' learning outcomes, writing development, and long-term educational practices.

Generative AI Usage Statement

ChatGPT GPT 5.5 was used during the preparation of this manuscript to support language revision and tables generation. No AI system was involved in the study design, data collection, data analysis, interpretation of results, or scientific decision-making. The authors, who take full responsibility for the content of this manuscript.

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Ethical Considerations

All participants provided written informed consent, and the data were anonymized to minimize any risk of participant identification or exposure. In addition, the study was approved by the Research Ethics Committee of the Federal Rural University of Pernambuco (Approval No. 85867624.1.0000.9547).

Artifact Availability

The study artifacts and supplementary materials are publicly available through the Open Science Framework (OSF): `https://tinyurl.com/SupplementaryMaterial-WIE2026` and `https://tinyurl.com/WIE-OSF`.

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