Needs Analysis for Developing a Genre-Based Writing Assessment Model for Bilingual University Students

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Abstract. This study addresses the need to develop a genre-based writing assessment model to enhance the scientific writing skills of bilingual university students. With Outcome-Based Education (OBE) implemented at Universitas Negeri Medan in 2019, it is crucial to align assessment practices with OBE's objectives in bilingual science classes. Through surveys and interviews with students and faculty, the research identifies deficiencies in the current KKNI policy for evaluating genre writing performance, highlighting issues such as content comprehension, organization, and academic writing conventions. The findings aim to inform the development of an authentic, valid, and reliable assessment model tailored to the specific needs of OBE in science writing, marking the first step toward establishing a practical framework for bilingual education assessment.

Keywords: Writing, Assessment Model, Bilingual Students, Genre-Based Pedagogy

1 Introduction

The adoption of Outcome-Based Education (OBE) in Indonesia in 2019 marked a significant paradigm shift in the nation's approach to higher education. By emphasizing measurable and outcome-driven competencies, OBE seeks to ensure that graduates are well-equipped with the skills, knowledge, and attitudes required for success in both academic and professional settings. This educational framework aligns with the Indonesian Qualifications Framework *(Kerangka Kualifikasi Nasional Indonesia*, KKNI), which provides a structured standard for defining learning outcomes across various levels of education. Under this framework, universities are expected to design their curricula, instructional strategies, and assessments to align with specific learning outcomes that reflect national and global demands. Universitas Negeri Medan, a prominent institution in Indonesia, has actively embraced these principles across its academic programs, including bilingual science education. However, while OBE has encouraged institutions to focus on outcomes, implementing it effectively—particularly in specialized areas such as scientific writing—remains a persistent challenge.

In bilingual science programs, students are required to master the ability to produce genre-specific scientific texts, which is a core academic competency. Scientific writing is a highly specialized skill that involves much more than linguistic accuracy; it demands an understanding of rhetorical structures, logical organization of ideas, and adherence to disciplinary conventions. This genre-specific expertise is vital for students to effectively communicate complex scientific concepts, contribute to their fields of study, and meet the demands of global academic discourse.

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However, at institutions such as Universitas Negeri Medan, current assessment practices often fall short of addressing the full spectrum of skills required for scientific writing. These assessments primarily emphasize surface-level language elements, such as grammar, spelling, and vocabulary usage, without adequately evaluating deeper rhetorical and structural competencies. For instance, while students may be penalized for minor grammatical errors, they often receive little to no feedback on the coherence of their arguments, the clarity of their reasoning, or their ability to meet the communicative purposes of scientific genres. This limited focus creates a significant gap between the skills students develop and the competencies they need to succeed in real-world academic and professional environments.

Addressing this gap is particularly crucial in bilingual education contexts, where students face unique challenges. Bilingual science students not only need to grapple with the linguistic demands of writing in English but also need to internalize the conventions of scientific writing genres. These dual demands can hinder their ability to produce texts that meet both linguistic and disciplinary expectations. Moreover, existing assessment practices often fail to recognize or accommodate the specific needs of bilingual learners, treating them as monolingual students or neglecting the interplay between their first language (L1) and second language (L2) competencies. This oversight further exacerbates the challenges they face, resulting in assessments that neither fully support their learning nor accurately reflect their abilities.

To address these challenges, it is imperative to conduct a thorough needs analysis. A needs analysis provides a systematic understanding of the gaps in current assessment practices, identifies the specific difficulties bilingual students encounter in scientific writing, and informs the development of more effective, tailored assessment models. By focusing on the actual needs and experiences of students, a needs analysis ensures that any proposed assessment framework is both relevant and impactful.

The theoretical foundation for this study is drawn from two complementary frameworks: Systemic Functional Linguistics (SFL) and Outcome-Based Education (OBE). SFL offers a powerful lens for understanding the role of language as a social semiotic system [1], highlighting the ways in which genres are shaped by their social purposes. According to SFL, effective communication within a genre requires mastery of three key metafunctions: the ideational metafunction (representing content accurately and effectively), the interpersonal metafunction (engaging and interacting with the audience appropriately), and the textual metafunction (ensuring coherence and logical organization) [2]. In scientific writing, these metafunctions are especially critical, as they underpin the ability to convey complex ideas clearly, logically, and persuasively. Meanwhile, OBE provides a complementary perspective by emphasizing the alignment of assessments with specific learning outcomes [3]. In the context of scientific writing, this means designing assessments that evaluate not only linguistic correctness but also the extent to which students can apply genre-specific conventions to achieve their communicative goals [4]. The integration of SFL and OBE offers a robust theoretical basis for addressing the limitations of current assessment practices.

This study aims to bridge the gap between existing assessment models and the competencies required for successful scientific writing in bilingual contexts. By conducting a comprehensive needs analysis among bilingual university students at Universitas Negeri Medan, the study seeks to uncover the challenges these students face and identify opportunities for improvement. The ultimate goal is to develop a genre-based writing assessment model that integrates the principles of SFL and OBE, providing a holistic framework for evaluating students' scientific writing skills. This model will not only address surface-level language issues but also focus on rhetorical and structural features, ensuring that assessments align with both the pedagogical goals of OBE and the practical demands of scientific communication.

1.1 Theoretical Framework

Systemic Functional Linguistics (SFL) provides a robust theoretical framework for understanding how language operates in specific cultural and situational contexts. Language, according to SFL, is a resource for making meaning, deeply influenced by the environment in which it is used ([5]; [6]). This perspective emphasizes the relationship between language and its social purpose, revealing how linguistic choices reflect cultural values, interpersonal relationships, and modes of communication.

1.1.1 Language and Context: Cultural and Situational Influences

SFL views context as operating on two levels: cultural context and situational context. At the cultural level, genres represent conventionalized ways of using language to achieve specific social purposes [7]. Genres such as narratives, explanations, and arguments are structured to meet their communicative goals, making them recognizable within a given culture. ([8];[9]) distinction between horizontal and vertical discourses further elucidates how cultural practices shape language. Horizontal discourse, characterized by every day, context-dependent knowledge, contrasts with vertical discourse, which involves context-independent, theoretical knowledge, as found in academic genres.

At the situational level, language use is shaped by three contextual dimensions: field (what the text is about), tenor (the relationships between participants), and mode (the medium of communication) [10]. These dimensions guide how language is used and interpreted in specific contexts, enabling predictions about likely linguistic choices in similar situations ([11]; [12]).

1.1.2 Genre-Based Pedagogy: A Structured Approach to Writing

The Sydney School's genre-based approach to pedagogy has significantly influenced literacy education by integrating SFL principles into classroom practice. Genres are viewed as staged, goal-oriented social processes, where each stage serves a specific rhetorical function to achieve the text's overall purpose ([13]; [7]). For instance, in scientific writing, stages such as introduction, methodology, results, and discussion are essential for meeting the communicative demands of the discipline ([14]; [15]). This staged organization supports students in producing coherent and purposeful texts.

[16] "Reading to Learn" model emphasizes scaffolding literacy by making genre conventions explicit through guided reading and writing tasks. This approach aligns with [17] concept of pedagogic discourse, which highlights the role of explicit instruction in transmitting cultural and academic knowledge.

1.1.3 Cultural Variations in Genre Conventions

Genres are not culturally neutral; they are deeply influenced by social norms and rhetorical traditions. For example, academic writing in Indonesian culture often reflects an inductive rhetorical style, where evidence is presented before conclusions, consistent with cultural values

such as hierarchy and indirectness ([18]; [19]). In contrast, English-speaking academic genres tend to favor a deductive structure, with main arguments presented upfront ([20]; [21]). These cultural differences underscore the importance of explicit genre instruction in bilingual or multilingual educational settings [22].

2 Method

The needs analysis was conducted with 20 bilingual university students from the Physics program at Universitas Negeri Medan, all enrolled in a scientific writing course. The study aimed to explore the students' experiences with current writing assessment practices and identify their challenges in mastering genre-specific writing tasks. By focusing on these students, the research sought to address the unique requirements of bilingual education, where students must navigate both the complexities of scientific content and the conventions of academic writing genres.

Data collection involved using a survey questionnaire as the primary instrument. The questionnaire was designed to capture a broad range of information, including students' perceptions of existing writing assessments, the particular difficulties they encounter in applying genre conventions, and the effectiveness of feedback in helping them improve their writing. The survey included Likert-scale questions to quantify responses and open-ended questions that provided more detailed insights into students' experiences. Additionally, document analysis was conducted on existing writing rubrics and assessment criteria used in the program to better understand how current practices align with the requirements of genre-based writing.

The data analysis process combined quantitative and qualitative techniques to understand the assessment needs comprehensively. Descriptive statistics were used to analyze the quantitative data, revealing trends in students' responses, such as common areas of difficulty in writing. The qualitative data from open-ended responses underwent thematic analysis to identify key themes related to writing challenges and assessment practices. Document analysis further supported the findings by comparing current rubrics with genre-specific requirements, highlighting areas where the assessment framework falls short. This approach thoroughly evaluated the existing practices, laying the groundwork for developing a more effective writing assessment model for bilingual students.

3 Results

The needs analysis was conducted to understand the challenges bilingual students face in mastering genre-specific scientific writing and to evaluate the effectiveness of current assessment practices in addressing these challenges. This analysis is based on responses from 20 students enrolled in the Physics program at Universitas Negeri Medan, all of whom were taking a scientific writing course. By combining quantitative survey data with qualitative insights from open-ended responses, a comprehensive understanding of the students' perceptions and needs was developed.

Table 1. The Result of Students' Perceptions of Current Writing Assessments

No	Question	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	Current assessments focus too much on grammar and vocabulary rather than genre-specific writing conventions	50%	40%	5%	5%	0%
2	I find it difficult to structure my writing according to genre-specific conventions (e.g., introduction, methodology, discussion in scientific writing)	45%	35%	10%	10%	0%
3	The feedback I receive on my writing helps me improve my use of genre-specific conventions	20%	30%	20%	20%	10%
4	I need more guidance on organizing ideas and arguments in my scientific writing	60%	25%	10%	5%	0%
5	I am satisfied with the current writing rubrics used in my course	15%	20%	30%	25%	10%

3.1 Common Challenges in Genre-Specific Writing

The survey results revealed a significant misalignment between current writing assessment practices and the demands of genre-specific scientific writing. A majority of students (50% strongly agreed and 40% agreed) reported that existing assessments focus excessively on surface-level elements such as grammar and vocabulary, rather than on critical genre-specific conventions. This overemphasis neglects the structural and rhetorical requirements essential for effective scientific communication, such as logical organization, clear presentation of arguments, and adherence to discipline-specific norms.

Moreover, a considerable proportion of students (45% strongly agreed and 35% agreed) indicated difficulty in structuring their writing according to the expected genre conventions, such as the proper formulation of the introduction, methodology, results, and discussion sections. These findings suggest that many students lack the necessary skills and knowledge to meet the organizational and rhetorical demands of scientific writing, presenting a substantial barrier to achieving the desired learning outcomes.

3.2 Role of Feedback in Writing Development

Feedback plays a crucial role in helping students refine their writing, yet the survey results indicate gaps in its effectiveness. Only 20% of students strongly agreed and 30% agreed that the

feedback they received improved their use of genre-specific conventions. Meanwhile, 20% expressed dissatisfaction, stating that feedback did not significantly help them. These results point to a disconnect between the feedback provided and the students' ability to apply it effectively.

Students noted that much of the feedback they receive tends to focus on general linguistic errors, such as grammar and vocabulary, rather than offering specific guidance on how to improve the structural and rhetorical aspects of their writing. For example, detailed advice on how to develop a coherent introduction, craft a persuasive discussion, or maintain logical flow across sections was often missing.

3.3 Need for Additional Guidance

The majority of students expressed a strong need for additional support in organizing ideas and arguments in their scientific writing. Specifically, 60% of students strongly agreed, and 25% agreed, that more guidance is necessary. This finding underscores the importance of incorporating explicit instructional strategies into the curriculum, such as providing clear frameworks for organizing academic content, exemplars of well-written scientific papers, and scaffolded writing activities that build students' competence in genre-specific tasks.

Students also highlighted the importance of receiving step-by-step guidance throughout the writing process, from brainstorming and outlining ideas to revising drafts for coherence and structure. Such tailored instructional support would not only enhance their understanding of academic writing conventions but also boost their confidence in producing high-quality scientific texts.

3.4 Students' Satisfaction with Current Rubrics

When evaluating the current rubrics used in their scientific writing course, students expressed mixed levels of satisfaction. Only 15% strongly agreed, and 20% agreed that the rubrics were satisfactory, while a combined 35% of students either disagreed or strongly disagreed. Another 30% remained neutral.

These responses suggest that the rubrics, while providing some structure for assessment, do not fully align with the challenges students face. Specifically, students noted that the rubrics focus heavily on linguistic accuracy and less on genre-specific elements, such as the logical sequencing of ideas, adherence to disciplinary conventions, and effective use of rhetorical strategies. The lack of explicit criteria for evaluating these higher-order writing skills highlights the need for a revised rubric that better addresses the expectations of scientific writing.

3.5 Qualitative Insights from Open-Ended Responses

In addition to the survey data, the open-ended responses provided valuable insights into students' experiences with writing assessments. Many students commented that current assessments prioritize surface-level features, such as spelling and grammar, at the expense of evaluating their ability to construct coherent arguments and adhere to genre-specific structures.

Students also expressed frustration with the general nature of the feedback they receive, noting that it often lacks actionable suggestions for improving key elements of scientific writing. For example, students reported difficulty in understanding how to organize an introduction effectively or present results in a clear and structured manner.

Furthermore, students emphasized the need for more practical examples and targeted instruction in genre-specific writing. They suggested incorporating more in-class activities focused on analyzing exemplary texts, practicing genre-specific structures, and receiving iterative feedback throughout the writing process. These activities, they argued, would better prepare them for the demands of academic and professional scientific communication.

3.6 Implications for Developing a Genre-Based Writing Assessment Model

The results from both the quantitative survey and qualitative insights suggest several key areas for improvement in the current writing assessment practices. The findings point to the necessity of a genre-based assessment model that:

a. Emphasizes the structural and rhetorical features of scientific writing, moving beyond grammar and vocabulary to evaluate the organization, coherence, and genre-specific conventions.
b. Provides detailed and targeted feedback that helps students understand how to improve their writing in relation to academic genre conventions.
c. Incorporates explicit instructional support, such as clear guidelines, exemplars, and in-class writing activities, to assist students in mastering genre-specific writing tasks.

4 Discussion

The findings of this study reveal significant limitations in the current writing assessment practices at Universitas Negeri Medan, particularly their misalignment with the genre-specific conventions essential for scientific writing. Drawing on the principles of Systemic Functional Linguistics (SFL), this discussion highlights the need for assessments that address the rhetorical and structural features unique to scientific genres. According to SFL theory, language operates as a social semiotic system, deeply embedded in cultural and situational contexts. Genres, viewed as "staged, goal-oriented social processes" [6], are shaped by their social purposes and require distinct organizational structures to fulfill those purposes. Scientific writing, for instance, follows a logical sequence, such as introduction, methodology, results, and discussion, that reflects its communicative goals. However, the current focus on grammar and vocabulary in assessments overlooks these critical elements, leaving students inadequately prepared to produce genre-specific texts.

The survey findings further underscore this issue, with nearly 80% of students reporting difficulty structuring their writing according to genre conventions. This reflects a lack of alignment between assessment practices and the expectations of scientific writing. Within the SFL framework, scientific writing involves three essential elements: field (content and subject matter), tenor (relationship between writer and audience), and mode (the organizational structure of the text). Effective assessments should evaluate how well students address these dimensions, yet the current rubric prioritizes linguistic accuracy over the organization, coherence, and logical flow required by scientific genres. This gap not only hinders students'

ability to achieve academic success but also misaligns with the SFL perspective, which views language as a tool for achieving specific social purposes.

Another key challenge identified in the study is the limited effectiveness of feedback in supporting students' development of genre-specific writing skills. Feedback, when aligned with SFL principles, should help students manage the field, tenor, and mode of their texts, guiding them to develop content that aligns with disciplinary conventions, maintain an appropriate academic tone, and organize ideas cohesively. However, only 20% of students strongly agreed that the feedback they received helped improve their genre-specific writing. This finding indicates a disconnect between the feedback provided and the learning goals it aims to address. Current feedback practices tend to focus on surface-level corrections, offering limited guidance on how students can improve the structural and rhetorical elements of their writing. To bridge this gap, feedback must be genre-oriented, offering clear and actionable suggestions that help students understand how to align their writing with the conventions of scientific genres.

Cultural context also plays a critical role in shaping students' writing practices, particularly in bilingual settings like Indonesia. The rhetorical preferences of Indonesian students, such as an inclination toward inductive reasoning (beginning with specific details before arriving at general conclusions), may conflict with the deductive reasoning often expected in Western academic writing. SFL's emphasis on the cultural and situational contexts of language suggests that effective assessments must consider these cultural influences while preparing students to meet international academic standards. By incorporating criteria that bridge local rhetorical preferences with global academic expectations, assessments can better support students in navigating these cross-cultural challenges.

The findings of this study point to the need for a genre-based assessment model that aligns with the principles of SFL and addresses the unique needs of bilingual students. Such a model should prioritize the structural and rhetorical features of scientific writing, moving beyond grammar and vocabulary to evaluate organization, coherence, and adherence to genre-specific conventions. Feedback should be restructured to provide detailed, genre-oriented guidance that helps students refine their purpose, audience awareness, and logical structure. Additionally, rubrics should incorporate clear criteria for evaluating genre-specific features while remaining sensitive to cultural influences on writing. Instructional strategies, such as scaffolding and the use of exemplars, can further support students in mastering the complexities of scientific writing.

By addressing these limitations, a genre-based assessment model can provide a more holistic approach to developing students' academic writing skills. Grounded in the principles of SFL, this model recognizes the interconnectedness of language, context, and purpose, offering bilingual students the tools they need to succeed in both local and global academic settings. Integrating these practices into the curriculum can foster not only improved writing performance but also greater confidence and competence in engaging with the conventions of scientific discourse.

5 Conclusion

In conclusion, the results of this study suggest that a genre-based writing assessment model, informed by the principles of Outcome-Based Education (OBE) and Systemic Functional Linguistics (SFL), would significantly enhance the ability to assess bilingual students' writing skills in a more comprehensive and authentic manner. This model should not only address

language correctness but also focus on the rhetorical and organizational aspects of scientific writing, ensuring that students can effectively communicate their ideas within the specific academic genres required in their fields.

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