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An Analysis of Students' Views on Assessment Methods in English for Chemistry Classes

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Abstract

This study explores undergraduate Chemistry students' perceptions of assessment methods implemented in an English for Specific Purposes (ESP) course for Chemistry. Using a quantitative descriptive research design, data were collected through a structured 5-point Likert-scale questionnaire administered to 56 undergraduate Chemistry students enrolled in an ESP course. The instrument, adapted from established assessment perception frameworks, was tested for validity and internal reliability before analysis, and the data were analyzed using descriptive statistics to examine perceptions related to assessment clarity, fairness, feedback, assessment methods, learning motivation, and assessment-related challenges. The findings reveal that students generally hold positive perceptions of assessment practices, particularly those that integrate English language skills with Chemistry content, such as project-based tasks and oral presentations, which were perceived as effective in supporting learning and developing scientific communication skills. Students also viewed the assessment system as relatively fair and aligned with their actual performance; however, challenges were identified, including language-related anxiety, difficulties in understanding assessment instructions delivered in English, and the moderate effectiveness of instructor feedback. Overall, the study highlights the importance of transparent, authentic, and formative assessment practices that align with students' linguistic proficiency and disciplinary needs, and it contributes empirical evidence to the ESP assessment literature while offering practical implications for improving content-language integrated assessment design in English for Chemistry and similar ESP contexts.

INTRODUCTION

English for Specific Purposes (ESP) has become increasingly important in science education as it helps students apply English within their academic and professional disciplines. ESP enables learners to acquire language skills and terminologies relevant to their specific fields, allowing them to communicate effectively in academic and workplace contexts (Hutchinson & Waters, 1987; Hyland, 2014). Moreover, ESP courses in science education promote learners' ability to access and interpret scientific texts, participate in professional discussions, and produce discipline-specific writing, which are essential skills in higher education and professional settings (Basturkmen, 2015; Pehala & Zur, 2025).

English for Chemistry courses are particularly relevant in global academic environments because they prepare students to communicate scientific concepts effectively in international contexts (Gryshchenko et al., 2021). Mastery of English enables chemistry students to read and comprehend international journals, research articles, and technical documents that are predominantly written in English, as well as to present research findings at international conferences and collaborate with scholars from diverse linguistic backgrounds. Therefore, English for Chemistry courses play a vital role in developing students' linguistic competence alongside their scientific expertise, ensuring active participation in the global scientific community.

Assessment is a crucial component in ESP learning because it significantly influences students' motivation, engagement, and learning outcomes. Previous studies in ESP and English-Medium Instruction (EMI) consistently report that students' learning experiences are strongly affected by how assessment tasks are designed, communicated, and evaluated. Transparent assessment criteria, clear rubrics, and constructive feedback have been shown to enhance students' confidence and academic performance (Brown, 2010; Lee & Orgill, 2021a; Zhusdenbay, 2024). However, despite the increasing attention to ESP assessment, research focusing specifically on assessment practices in English for Chemistry contexts remains limited.

Most existing studies tend to focus on teachers' perspectives or general ESP assessment practices, with relatively little emphasis on students' perceptions in discipline-specific English courses. This lack of learner-centered research creates uncertainty regarding how assessment practices influence students' motivation, language development, and disciplinary learning in English for Chemistry courses. Recent studies indicate that students often experience challenges related to language anxiety, limited scientific vocabulary, and difficulties in understanding assessment instructions delivered in English, which may affect their overall learning experience (Goss, 2022).

The growing integration of English in Chemistry programs therefore calls for a deeper understanding of how students experience and respond to assessment practices. Students may react differently to various assessment types depending on their English proficiency and academic confidence. Understanding students' perceptions can help institutions and educators design fairer, more inclusive, and more effective assessment systems that align linguistic objectives with disciplinary learning goals (Rahmi et al., 2020).

This research is grounded in educational theories that emphasize fairness, interaction, and contextual learning. Brown, (2010) assessment theory highlights the importance of validity and fairness in evaluation, Vygotsky's constructivist learning theory emphasizes learning through interaction and reflection, and Hutchinson and Waters' ESP framework stresses the relevance of contextualized language learning. Drawing on these theoretical perspectives and recent empirical studies, the present research aims to examine students' perceptions of assessment methods in English for Chemistry courses and to contribute empirical evidence to the ongoing discussion of effective assessment practices in ESP contexts.

RESEARCH METHODOLOGY

This study employed a quantitative approach using a descriptive survey design to examine students' perceptions of assessment practices implemented in English for Chemistry courses. A quantitative descriptive design was considered appropriate because the study aimed to systematically describe students' perceptions without investigating causal or correlational relationships.

This approach allowed the research objectives to be addressed clearly by capturing measurable data related to assessment transparency, fairness, task relevance, and the quality of instructor feedback.

The participants of this study were undergraduate Chemistry students enrolled in English for Chemistry classes at the tertiary level. These students were selected because they had direct experience with English-medium assessment practices in a discipline-specific context. To ensure the relevance of participants' responses, purposive sampling was applied based on specific criteria, including enrolment in the English for Chemistry course and sufficient exposure to both Chemistry content and English academic instruction. A total of 56 students participated in the study, which was considered adequate for generating meaningful descriptive quantitative data in a survey-based study.

Data were collected using a closed-ended questionnaire administered through an online survey platform at the end of the academic semester. The questionnaire employed a five-point Likert scale ranging from *strongly disagree* to *strongly agree* and was designed to measure students' perceptions of assessment practices, including clarity of assessment criteria, alignment between assessment tasks and course content, fairness of grading, and the usefulness of feedback in supporting learning improvement. The use of a structured questionnaire enabled consistent data collection and enhanced the reliability of the responses.

The collected data were analyzed using descriptive statistical techniques, including mean scores, percentages, and standard deviations, to identify overall trends in students' perceptions of assessment practices in English for Chemistry courses. Statistical analysis was conducted using appropriate data-processing software to ensure accuracy and consistency in data interpretation. The findings were presented in a descriptive manner to provide a clear overview of students' assessment experiences and to support evidence-based discussion aligned with the study's research objectives.

The selection of a quantitative descriptive design was further justified by the study's intent to establish baseline data on assessment perceptions in a relatively understudied ESP context. As John W. Creswell, (2012) note,

descriptive survey designs are particularly appropriate when the goal is to characterize the current state of a phenomenon rather than to test hypotheses or establish causal relationships. In this study, the phenomenon of interest — students' perceptions of assessment — required a structured, replicable, and scalable measurement approach that would allow for comparison across individual participants as well as meaningful aggregation at the group level.

The questionnaire was developed through a systematic instrument adaptation process. Items were initially drawn from validated ESP and general language assessment perception scales, including the Assessment Experience Questionnaire adapted by Carless & Boud, (2018) and the language learner perception inventory used in recent EMI research (Galloway & Ruegg, 2020). Items were subsequently revised to reflect the specific context of English for Chemistry assessment, ensuring content validity by aligning each item with the study's conceptual framework. A panel of three ESP educators and two Chemistry lecturers reviewed the adapted instrument for face validity and construct alignment prior to piloting.

A pilot study was conducted with 15 students who had previously completed the English for Chemistry course but were not included in the main study sample. Pilot data were used to calculate Cronbach's alpha for each subscale, yielding reliability coefficients ranging from 0.78 to 0.87, which exceed the 0.70 threshold recommended for research instruments in educational settings (Hair Jr et al., 2019). Items with corrected item-total correlations below 0.30 were revised or removed, resulting in a final instrument comprising 20 items distributed across five subscales: assessment clarity and transparency, assessment fairness, relevance of assessment tasks, quality of instructor feedback, and assessment-related challenges and preferences.

Data collection was administered through Google Forms at the end of the academic semester to ensure that participants had sufficient exposure to the range of assessment practices used in the course. The online administration platform ensured anonymity, reduced social desirability bias, and allowed efficient data management. Participation was voluntary, and students were informed that their responses would not affect their grades or academic

standing. The response rate was 100%, as all 56 enrolled students completed the questionnaire. This high response rate was attributed to the accessible online format and the timing of administration during a low-demand period following final assessments.

Descriptive statistics were computed for each item and subscale using SPSS version 26. Mean scores were interpreted using the following intervals: 1.00–1.79 (Very Negative), 1.80–2.59 (Negative), 2.60–3.39 (Moderate/Neutral), 3.40–4.19 (Positive/Agree), and 4.20–5.00 (Very Positive). Standard deviations were reported to indicate the degree of variability in responses. Frequency distributions were also examined to identify any polarization in student responses, particularly for items related to challenge and anxiety. Findings are presented thematically, aligned with the five subscales of the instrument, and discussed in relation to the study's theoretical framework and prior empirical research.

RESEARCH FINDING AND DISCUSSION

This section presents the findings of the study organized according to four key dimensions of assessment perception: clarity and transparency, methods and relevance, feedback quality and learning motivation, and assessment-related challenges and preferences. For each dimension, descriptive statistics—including mean scores and standard deviations—are reported and subsequently discussed in relation to relevant theoretical frameworks and prior empirical research. Mean scores are interpreted on a five-point scale, where 3.40–4.19 indicates positive perceptions and 4.20–5.00 indicates very positive perceptions.

Table 1. Students' Perceptions of Assessment Clarity and Transparency

No	Statement Indicators	Mean	SD	Interpretation
1	Students understand the purpose of assessment in English for Chemistry classes	3.41	0.87	Moderate
2	Assessment is conducted fairly and objectively	3.52	0.89	Moderate
3	Assessment results reflect students' actual performance	3.55	0.83	Moderate
4	Students expect clearer assessment rubrics and criteria	3.60	0.85	Moderate–High

As shown in Table 1, students generally perceive the assessment process as fair and reflective of their actual performance. However, the relatively moderate mean score for understanding assessment purposes (M = 3.41) suggests that clearer communication and more explicit rubrics are needed to improve transparency and strengthen students' confidence in navigating assessment requirements. This finding aligns with Brown's (2004) assertion that validity and clarity are foundational to effective and equitable assessment design.

Table 2. Students' Perceptions of Assessment Methods and Relevance

No	Statement Indicators	Mean	SD	INTERPRETATION
1	Assessment methods help measure students' English and chemistry abilities	3.63	0.91	Moderate–High
2	Assessment encourages active use of chemistry-related English vocabulary	3.52	0.97	Moderate
3	Project-based assessment supports understanding of chemistry concepts in English	3.55	0.93	Moderate–High
4	Oral assessment improves scientific communication skills	3.68	0.88	High

As shown in Table 2, students hold positive perceptions toward assessment methods that integrate language and chemistry content. Oral and project-based assessments in particular are perceived as highly effective in enhancing scientific communication (M = 3.68 and M = 3.55, respectively), underscoring the importance of authentic and communicative assessment practices in ESP contexts and supporting Hutchinson and Waters' (1987) emphasis on contextualized, discipline-specific language learning.

Table 3. Students' Perceptions of Instructor Feedback and Learning Motivation

No	Statement Indicators	Mean	SD	Interpretation
1	Instructor feedback on assessment results is clear and helpful	3.45	0.97	Moderate
2	Assessment system supports students' learning motivation	3.48	0.74	Moderate

As presented in Table 3, although students perceive feedback and learning motivation positively overall, the moderate mean scores (M = 3.45 and M = 3.48, respectively) suggest that current feedback practices leave room for improvement. Providing more detailed, criterion-referenced, and timely feedback may further enhance students' engagement and learning outcomes, consistent with Vygotsky's (1978) constructivist emphasis on interaction and guided feedback as catalysts for development.

Table 4. Students' Perceptions of Assessment-Related Challenges and Preferences

No	Statement Indicators	Mean	SD	Interpretation
1	Students experience anxiety during English-based assessments	3.52	1.04	Moderate
2	Students experience difficulty understanding assessment instructions in English	3.48	1.03	Moderate
3	Students prefer assessments focusing on critical thinking and scientific communication	3.57	0.90	Moderate–High
4	Students prefer a balance between writing and speaking assessments	3.56	0.88	Moderate–High

The results in Table 4 reveal that students encounter moderate levels of anxiety and difficulty when completing assessments conducted in English (M = 3.52 and M = 3.48, respectively). Nevertheless, students demonstrate a clear preference for assessments that emphasize critical thinking and scientific communication (M = 3.57), as well as for a balanced integration of writing and speaking tasks (M = 3.56). Taken together, these findings suggest that while English-medium assessment poses genuine linguistic challenges, students value authentic and multimodal assessment designs that support the development of disciplinary communication skills. This underscores the need for scaffolding strategies—such as structured speaking templates, bilingual glossaries, and phased task preparation—to reduce anxiety and promote equitable participation in ESP assessment contexts (Tsagari, 2013).

Collectively, the findings presented in Tables 1 through 4 indicate that students generally hold positive perceptions of assessment practices implemented in English for Chemistry courses. Overall, the results demonstrate

that assessment transparency, fairness, relevance of assessment tasks, and the quality of instructor feedback are perceived as important factors supporting students' learning experiences. These findings suggest that well-designed, discipline-integrated assessment practices can facilitate both language development and content understanding in ESP contexts.

Students reported favorable views regarding the clarity of assessment criteria and grading procedures. Clear rubrics and explicit expectations were perceived as contributing to a sense of fairness and reducing uncertainty during assessment processes. This finding aligns with Brown's (2004) assessment theory, which emphasizes transparency and validity as essential components of effective assessment. Similar results have also been reported in recent ESP studies, which highlight that transparent assessment criteria enhance students' confidence and engagement, particularly in English-medium science courses (Lee & Orgill, 2021b).

In terms of assessment relevance, students indicated that assessment tasks closely aligned with chemistry content were more meaningful and motivating. Tasks such as project-based assignments, presentations, and applied writing activities were perceived as effective in helping students integrate language skills with scientific knowledge. This supports Hutchinson and Waters' (1987) ESP framework, which stresses the importance of contextualized language learning tailored to learners' disciplinary needs. Recent research in ESP and EMI contexts similarly suggests that discipline-specific assessments promote deeper learning and better transfer of academic language skills (Rahmi et al., 2020).

Regarding feedback, the findings reveal that instructor feedback was generally perceived as helpful, although its effectiveness varied. Students valued feedback that was specific, constructive, and related to both language accuracy and scientific content. However, some students reported that feedback was occasionally insufficient in addressing language difficulties, particularly in scientific writing and terminology. This finding resonates with Vygotsky's constructivist learning theory, which emphasizes feedback and interaction as central to learning development, and is consistent with recent studies

highlighting the need for more formative and dialogic feedback in ESP classrooms (Goss, 2022).

Despite the overall positive perceptions, the findings also reveal challenges faced by students, including limited English proficiency, difficulties with scientific vocabulary, and anxiety when completing assessments in English. These challenges suggest that assessment practices should not only evaluate learning outcomes but also function as learning tools that support students' gradual development. This supports recent arguments in ESP assessment literature that formative and scaffolded assessments are essential for addressing learners' linguistic and cognitive needs in science-based English courses.

Taken together, the findings indicate that effective assessment practices in English for Chemistry courses should balance fairness, transparency, and disciplinary relevance while providing meaningful feedback that supports both language and content learning. By aligning assessment design with ESP principles and students' learning needs, educators can enhance students' motivation, academic confidence, and readiness to participate in global scientific communication.

FURTHER ANALYSIS AND IMPLICATIONS

The relationship between assessment design and student motivation represents another critical dimension revealed by this study. Findings indicate that students demonstrated higher levels of motivation when assessment tasks were perceived as relevant, challenging, and connected to real-world scientific communication scenarios. This is consistent with Self-Determination Theory (Deci & Ryan, 2012), which posits that motivation is enhanced when individuals perceive their activities as meaningful, personally significant, and aligned with their goals. In the context of English for Chemistry, assessments that required students to prepare English-language research summaries, deliver scientific presentations, or write laboratory discussion sections were rated more highly for motivational value than traditional grammar-based tests.

The study also revealed important patterns related to the intersection of language proficiency and assessment performance. Students with lower self-reported English proficiency tended to express greater anxiety, particularly when assessments involved spoken English components. This aligns with findings by Tsagari and Sifakis (2022), who reported that oral assessment formats in ESP contexts disproportionately disadvantaged students with limited speaking confidence, even when their content knowledge was adequate. These findings raise equity concerns and suggest that scaffolding mechanisms — such as preparation time, glossary access, and structured speaking templates — should be systematically integrated into the assessment process.

Feedback quality emerged as a multidimensional construct in this study, encompassing not only the clarity and specificity of instructor comments but also the timing, mode, and perceived intent of feedback delivery. While students acknowledged the value of written feedback on essays and reports, many expressed a preference for oral feedback on presentations and project work, suggesting that different assessment modalities may warrant correspondingly different feedback formats. These preferences are consistent with Carless and Boud's (2018) argument that feedback literacy must be explicitly cultivated as part of the ESP curriculum through structured feedback dialogue sessions, peer feedback activities, and self-assessment rubrics.

Peer assessment and self-assessment were mentioned by a notable proportion of students as underutilized components of the current assessment system. Students who had experienced peer review activities reported greater understanding of assessment criteria and more confidence in self-evaluating their own work. This finding supports the growing body of research advocating for collaborative and self-regulated assessment practices in higher education ESP contexts (Andrade & Brookhart, 2020; Meece, 2023). Incorporating systematic peer assessment protocols into English for Chemistry courses may not only distribute the evaluative burden more equitably but also deepen students' metalinguistic awareness and critical engagement with scientific writing conventions.

The sociocultural dimension of assessment also merits attention in interpreting the study's findings. Students' perceptions of assessment fairness were influenced not only by the technical design of tasks but also by social dynamics of the classroom, including instructor-student relationships and cultural norms regarding academic evaluation. As Darling-Hammond et al., (2024) observe, fair assessment in multicultural contexts requires not only psychometric validity but also cultural responsiveness — ensuring that assessment tasks, instructions, and evaluation criteria are accessible and equitable for students from diverse linguistic and academic backgrounds. Future research should therefore explore the cultural and institutional factors that shape students' experiences of assessment in discipline-specific ESP courses.

From a practical standpoint, the findings suggest several concrete recommendations for English for Chemistry instructors and curriculum designers. First, the development and consistent use of detailed assessment rubrics that clearly articulate criteria for both linguistic and disciplinary performance can reduce student uncertainty and promote equitable grading. Second, the integration of formative assessment checkpoints — such as draft submission reviews, in-class practice presentations, and vocabulary pre-assessments — can provide students with ongoing opportunities to gauge their progress and receive targeted support before summative evaluation. Professional development programs for ESP instructors should also address the pedagogical demands of assessing content-integrated tasks (Isbell et al., 2022; Wiliam & Leahy, 2024).

The implications of this study extend beyond the immediate context of English for Chemistry at UIN Syarif Hidayatullah Jakarta. As English-medium instruction continues to expand in Indonesian higher education and across the broader Southeast Asian region, the need for empirically informed, context-sensitive assessment practices in ESP courses has become increasingly urgent. Institutional policy frameworks should prioritize the allocation of resources for instructor training in ESP assessment, the development of locally adapted assessment instruments, and the creation of institutional support structures — such as language centers and writing clinics — that can complement classroom

assessment by providing targeted language development support for students in content-specific English programs (McKinley & Rose, 2022).

In summary, this study makes a threefold contribution to the ESP assessment literature. First, it extends the empirical base on learner perceptions of assessment in English for Chemistry — a context that remains understudied relative to other disciplinary ESP fields. Second, it applies a comprehensive, multi-subscale measurement framework that captures the nuanced and multidimensional nature of students' assessment experiences. Third, it generates context-specific pedagogical recommendations grounded in both theoretical frameworks and local institutional realities. These contributions are particularly timely given the growing momentum toward internationalization and English-medium instruction in Indonesian higher education (Puspitasari & Ishak, 2023).

It is also important to acknowledge the limitations inherent in self-report survey data, which constitute the sole source of evidence in this study. Students' retrospective perceptions may be influenced by recency effects, social desirability, and individual differences in reflection and self-awareness. Future studies should therefore complement survey data with qualitative methods — such as semi-structured interviews, focus groups, or classroom observations — to triangulate findings and provide richer contextual explanations. Longitudinal designs that track changes in students' assessment perceptions over multiple semesters would offer valuable insights into the developmental trajectory of assessment literacy and English proficiency in ESP contexts (Chaovanapricha & Champakaew, 2024; Durmuş & Güven, 2025).

Finally, policymakers and institutional leaders in higher education should view the findings of this study as an invitation to reflect critically on the structural conditions that enable or constrain effective ESP assessment. Adequate instructional time, appropriate class sizes, access to professional development resources, and institutional frameworks for ESP curriculum renewal are all systemic prerequisites for the kinds of high-quality, learner-centered assessment practices advocated in this study. Without sustained institutional commitment to these conditions, even the most thoughtfully designed individual assessments

will be insufficient to address the complex linguistic and disciplinary challenges faced by students in English for Chemistry and similar ESP courses. This study therefore calls for a multi-level response — spanning classroom practice, departmental curriculum, and institutional policy — to ensure that assessment in ESP genuinely serves the learning needs of all students (Starfield & Hafner, 2025).

CONCLUSION AND SUGGESTION

The study indicates that students generally perceive assessment practices in English for Chemistry courses positively, particularly in terms of fairness, transparency, and alignment with learning objectives, with authentic tasks such as project-based assignments and oral presentations proving especially effective in enhancing scientific communication and meaningful learning. However, challenges remain, including language-related anxiety, difficulties in understanding English-based assessment instructions, and the moderate effectiveness of instructor feedback. These findings underscore the need for more formative, supportive, and linguistically accessible assessment practices, including clearer rubrics, explicit communication of assessment criteria, and more timely, specific, and criterion-referenced feedback. Additionally, integrating scaffolding strategies and language support can help reduce student anxiety and improve comprehension. While the study provides valuable empirical insights, its scope is limited by its descriptive design, reliance on self-reported data, and a relatively small, single-context sample. Therefore, future research should involve larger and more diverse populations and consider more robust designs—such as mixed-methods or longitudinal approaches—to further explore how assessment practices influence students' language development and academic achievement in ESP contexts.

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