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Contribution of English Writing Skills to Students' Ability to Answer Chemistry Examinations in Public Secondary Schools in Morogoro Municipality, Tanzania

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Abstract: **This study examined the contribution of English writing skills to students' ability in answering Chemistry examination questions in public secondary schools in Morogoro Municipality, Tanzania. The study was guided by Cognitive Academic Language Proficiency Theory, which emphasizes the importance of academic language proficiency in understanding and communicating complex academic knowledge including answering the examinations questions. A convergent research design was adopted under the positivist philosophy. The study involved 148 participants, comprising 38 Chemistry teachers, 10 Heads of secondary Schools, and 100 secondary students. Purposive sampling was used to select Chemistry secondary teachers and secondary Heads of Schools, while simple random sampling using the lottery method was used to select students. Data were collected through questionnaires, interviews, focus group discussions, document analysis, and classroom observations. Quantitative data were analysed using descriptive statistics, while qualitative data were analysed thematically. The findings of the study revealed that English writing skills contribute to students' ability to answer Chemistry examination questions. The study concluded that students' ability to demonstrate Chemistry knowledge in written examinations is influenced not only by conceptual understanding but also by their English writing skills. The study recommends Chemistry teachers to adopt language-supportive teaching approaches, Heads of secondary Schools to strengthen support and supervision of Chemistry teachers, and schools to establish writing competitions and promote collaboration between Chemistry and English teachers to strengthen students' academic and scientific writing skills.**

Keywords: **English Writing Skills, Chemistry Examination, Academic Language Proficiency, Scientific Writing, Chemistry Performance.**

1. INTRODUCTION

Students' performance in Chemistry is an important indicator of achievement in science education (OECD, 2024). The performance in Chemistry determines students' progression and aspiration into science-related careers, such as medicine, engineering, pharmacy, and chemistry-related professions (Shwartz et al., 2021). In this regard, Chemistry requires learners to understand scientific concepts, solve problems, interpret experimental results, and communicate scientific knowledge effectively. Chemistry examinations require students to explain scientific principles, describe chemical processes, interpret experimental results, and justify conclusions in writing (Graham et al., 2020; OECD, 2024). This shows that writing skills is an important part of learning and assessment in Chemistry subject. Understanding a scientific concept and explaining it accurately in writing are not necessarily the same. A student may understand a chemical process but struggle to

communicate the explanation clearly, while another may express ideas fluently but have an inadequate understanding of the scientific principles involved. This distinction raises an important question about the extent to which students' English writing skills contribute to their ability to demonstrate Chemistry knowledge in examinations.

Writing skills in Chemistry involves more than constructing grammatically correct sentences (Montgomery et al., 2022). This means that students are expected to select appropriate scientific terminology, organise information logically, use chemical symbols and formulae correctly. They are also required to provide explanations that address the requirements of examination questions. These demands become particularly important when questions require students to explain processes, interpret experimental observations, or justify scientific conclusions. Difficulties with written expression may result in incomplete explanations or unclear responses, making it difficult for examiners to identify the knowledge students intend to demonstrate. Gupte et al. (2021) and Xodabande et al. (2023) revealed the importance of language and writing in academic learning. The relationship between writing skills and Chemistry performance requires careful examination because weaknesses in written responses may also arise from inadequate conceptual understanding or limited knowledge of Chemistry terminology.

International studies have examined the relationship between scientific language, writing proficiency, and students' understanding of science. Aizawa (2025) found that students' use of scientific language was associated with their understanding of Chemistry concepts and examination performance. Azamat et al. (2024) reported that students with a stronger command of scientific terminology demonstrated better understanding of complex Chemistry concepts. In African context, Kithinji and Ohirsi (2022) and Mulei (2022) reported positive associations between language proficiency and students' academic performance and participation in science learning. These findings indicate that language is relevant to how students learn and demonstrate scientific knowledge. However, general language proficiency, scientific terminology, and English writing skills are related but distinct aspects of learning. Evidence that language proficiency is associated with academic achievement does not, by itself, establish the specific contribution of writing skills to students' ability to answer Chemistry examination questions. This distinction provides a basis for examining writing skills in relation to the particular demands of Chemistry assessment.

The issue is particularly relevant in Tanzania, where English language is the medium of instruction in secondary education, unlike primary education, in which Kiswahili is predominantly used as the language of instruction (MoEST, 2023). Students progressing in secondary school education are required to learn subjects and demonstrate their understanding through English language. In Chemistry, this requires them not only to understand scientific terminology but also to use it when constructing explanations and answering examination questions. Difficulties may arise when students understand a concept but cannot express it adequately in English. Patrick (2020), Afyusisye and Gakuba (2022), and Ndabakurane (2024) reported challenges associated with students' use of English for academic purposes. Their findings provide a relevant context for investigating whether English writing difficulties also affect how students communicate Chemistry knowledge in written examinations.

Evidence from national Chemistry examinations further demonstrates the importance of examining students' written responses. The 2024 CSEE Chemistry Examination Report indicated that only 37.45% of candidates correctly described procedures in a practical question (NECTA CIRA Report, 2024). This analysis in CIRA report may raises questions about candidates' ability to communicate procedural scientific information in the form required by the examination. Describing a procedure requires students to understand the process and present the relevant steps accurately and coherently. However, the reported result does not establish whether the difficulties arose from limited Chemistry knowledge, weaknesses in English writing, or a combination of these factors. The distinction matters because interventions intended to improve students' scientific understanding may differ from those intended to improve their written explanations. Consequently, examining students' writing skills alongside their Chemistry examination responses may help clarify the difficulties they experience when communicating scientific knowledge.

The challenge is also relevant to public secondary schools in Morogoro Municipality. The 2026 Morogoro Regional Form Four Mock Examination results indicates that many students sat for the examination scored grade D and F (famnet.co.tz). This means that students' performance in Chemistry subject in public secondary school in Morogoro municipality is largely only satisfactory and not excellent. Although these results shows a limited achievement at the higher grade levels, they do not identify the factors responsible for the performance. In particular, they cannot establish whether students' English writing skills contributed to the results. The language demands of Chemistry examinations, together with the difficulties

reported in examination reports, justify the need to investigate how students' writing skills contribute to their ability to answer Chemistry questions. This investigation can help establish whether difficulties in written expression affect students' ability to express Chemistry knowledge in Chemistry examinations.

Previous studies have associated Chemistry performance with factors such as inadequate learning resources, teaching approaches, difficulties understanding scientific concepts, and challenges interpreting and answering examination questions (Sibomana et al., 2021; Manyilizu, 2023). Although these factors are important, they do not fully address the specific question of how students' English writing skills contribute to their ability to answer Chemistry examination questions. Moreover, evidence concerning general language proficiency does not necessarily explain the difficulties students experience when organising scientific ideas, selecting appropriate Chemistry terminology, or developing complete written explanations. The extent to which these difficulties occur among students in public secondary schools in Morogoro Municipality therefore warrants further investigation.

This study assessed the contribution of English writing skills to students' ability to answer Chemistry examination questions in public secondary schools in Morogoro Municipality, Tanzania. It focused on how students' writing skills were related to the clarity of their responses, the organisation of scientific ideas, the explanation of Chemistry concepts and processes, and the use of appropriate scientific terminology. By examining teachers' views alongside students' experiences, classroom observations, and Chemistry examination scripts, the study sought to provide a contextual understanding of the relationship between English writing skills and students' ability to demonstrate Chemistry knowledge in written examinations.

Research Objectives

(i) To assess the contribution of English writing skills on students' ability to answer Chemistry examination questions in public secondary schools in Morogoro Municipality.

Research questions.

(i) To what extent do English writing skills contribute to students' ability to answer Chemistry examination questions in public secondary schools in Morogoro Municipality?

2. THEORETICAL FRAMEWORK.

This study was guided by Cognitive Academic Language Proficiency (CALP) Theory, developed by Jim Cummins (1979, 1981). According to Cognitive Academic Language Proficiency (CALP) Theory, students' ability to succeed in academic tasks depends partly on their ability to understand and use the language required for academic learning. In the context of this study, the CALP theory enabled the researcher to assess the extent to which students' academic English writing skills contribute to their ability to organise Chemistry knowledge in Chemistry examinations.

3. METHODOLOGY

This study was conducted in public secondary schools in Morogoro Municipality, Tanzania. Morogoro Municipality was selected due to the current poor students' performance in Chemistry subject which raise questions about whether students' English writing skills contribute to their ability to understand Chemistry examination questions that require them to organize their Chemistry knowledge effectively in written responses.

The study employed a convergent research design under the positivist philosophy, involving 148 participants comprising 38 Chemistry teachers, 10 Heads of Schools, and 100 students. Chemistry teachers and Heads of Schools were obtained purposively, while simple random sampling was applied to obtain students. Data for this study were collected through questionnaires administered to Chemistry teachers, interviews with Heads of Schools, and focus group discussions with students to ensure validity and reliability of the study. In this case, the validity of the data collection instruments was ensured through expert review to assess the relevance, clarity, and adequacy of the items in relation to the study objectives. Reliability of the questionnaire was established using Cronbach's alpha coefficient computed through SPSS, which yielded a reliability coefficient of 0.83, indicating good internal consistency of the questionnaire items. Quantitative data obtained from the questionnaires were analysed using descriptive statistics, including frequencies, percentages, means, and standard deviations, while qualitative data from interviews, focus group discussions, document analysis, and classroom observations were analysed thematically. The quantitative and qualitative findings were subsequently compared and integrated during interpretation to establish areas of convergence and divergence regarding the contribution of English writing skills to students' ability to answer Chemistry examination questions.purposes.

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4. RESULTS AND DISCUSSIONS

4.1 Contribution of English writing skills to students' ability to answer Chemistry examination questions in public secondary schools in Morogoro Municipality.

4.1.1 Quantitative Findings

This subsection presents quantitative findings on the contribution of English writing skills to students' ability to answer Chemistry examination questions in public secondary schools in Morogoro Municipality. The findings are based on questionnaire responses from 38 Chemistry teachers. The questionnaire examined how students' English writing skills contribute to their ability to organise written responses, communicate Chemistry knowledge, explain scientific concepts, use appropriate scientific terminology, and provide complete answers in examinations. The responses were analysed using descriptive statistics, including frequencies, percentages, means, and standard deviations, as presented in Table 1.

Table 1: Teachers' Response Students' English Writing Influence on Students' Ability to Answer Chemistry Examination Questions (n = 38)

STATEMENTS	Responses in F (%)					MEAN
	SD	D	U	A	SA	
Students who have strong English writing skills are more likely to score higher in Chemistry essay questions.	2 (5.3%)	4 (10.5%)	4(10.5)	18 (47.4%)	10(26.3%)	3.8
Students ability to organize written responses influences how they answer Chemistry examination questions.	3(7.9%)	5(13.2%)	2(5.3%)	16(42.1%)	12(31.6%)	3.7
Poor English writing skills make it difficult for students to communicate their Chemistry knowledge effectively during examinations.	3 (7.9%)	5 (13.2%)	3 (7.9%)	16 (42.1%)	11(28.9%)	3.7
Students ability to explain Chemistry concepts in writing is influenced by their English writing skills.	2(5.3%)	6(15.8%)	3(7.9%)	18(47.4%)	9(23.7%)	3.6
Students can provide complete Chemistry answers even when they have difficulties expressing ideas in English writing.	9(23.7%)	13(34.2%)	3(7.9%)	8 (21.1%)	5(13.2%)	2.6
Students' use of appropriate scientific language in written responses affects their performance in Chemistry examinations.	4(10.5%)	5(13.2%)	2(5.3%)	17(44.7%)	10(26.3%)	3.6

Key: SD = Strongly Disagree, D = Disagree, U = Undecided, A = Agree, SA = Strongly Agree

Source: Field Data, 2026

Table 1 presents the responses of teachers regarding the influence of students English writing skills on their ability to answer questions in Chemistry examinations. The findings of this investigation show that English writing skills are considered to be an important factor in students performance in Chemistry examinations. Of the Chemistry teachers who responded to this question, a majority of the teachers (73.7%) agreed that students ability to organize their written answers contributes the way that they respond examination questions. In contrast, 21.1% disagreed with this statement, and the remainder (5.3%) of teachers were undecided in their responses. Thus, the performance of students on Chemistry examinations appears to be influenced not just by their knowledge of Chemistry subjects, but also by their ability to organize their responses to examination questions. Additionally, 71.0% of teachers indicated their agreement that the science-related language that students use in their written answers can contribute their performance in Chemistry examinations, while 23.7% of teachers indicated their disagreement with this statement, with the remainder of teachers (5.3%) being undecided in their responses. Thus, these findings indicate that student performance on Chemistry examinations may also be influenced by their knowledge of the science-related terminology associated with Chemistry subjects. Therefore, the weaknesses in scientific language might reduce the accuracy and quality of students written responses.

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Data in Table 1 shows that 73.7% of the teachers agreed that the students skills in English writing affect their abilities to explain the Chemistry concepts. On the other hand, 21.1% of the teachers disagreed with this statement, while 5.3% of the teachers were undecided as to whether this was true or not. This indicates that the students skills in English writing can effect their ability to transform their understanding of Chemistry concepts into answers to examination questions.

The findings also reveal that 57.9% of the teachers disagreed with the statement that students with difficulties in English writing can still provide complete answers to Chemistry examination questions. In contrast, 34.2% of the teachers agreed with the statement, while 7.9% of the teachers were undecided as to the truth of the statement. These findings indicate that teachers generally view that students have a need for strong English writing skills in their subject area of Chemistry. Thus, difficulties in English writing may effect the students ability to demonstrate the Chemistry knowledge that they actually possess.

Data in Table 1 indicates that 57.9% of the teachers agreed with the statement that students with strong skills in English writing will perform higher in examination questions regarding Chemistry concepts, while 15.8% of the teachers disagreed with the statement, and the remaining 10.5% of the teachers were undecided in their opinions regarding this statement. These results indicate that the students writing skills may impact their abilities to provide detailed answers to Chemistry essay-type examination questions.

4.2.2 Qualitative Findings

This subsection presents findings on how English writing skills contribute to students' ability to answer Chemistry examination questions. The data were collected through interviews with Heads of Schools, focus group discussions with students, classroom observations, and analysis of students' Chemistry examination scripts. Classroom observations examined how students participated in Chemistry lessons, expressed scientific ideas, and engaged in activities that required written explanations. The examination scripts were examined to identify difficulties in explaining concepts, organising answers, using Chemistry terminology, and providing complete responses.

Three themes emerged from the analysis: writing skills and clarity of Chemistry examination responses; writing skills and organisation of scientific ideas; and writing skills and explanation of Chemistry concepts and processes. The findings show how difficulties in written English may affect the way students present their Chemistry knowledge in examinations. Evidence from interviews, focus group discussions, classroom observations, and examination scripts was compared to establish similarities and differences in the findings.

4.2.2.1 Writing Skills and Explanation of Chemistry Concepts and Processes

The findings showed that some students experienced difficulties explaining Chemistry concepts in written English, even when they understood what they wanted to communicate. During a focus group discussion, Student 2 explained:

"Sometimes I understand the concept, but when I try to explain it in the examination, I fail to get the right words to describe what happens." (Student 2, FGD 7, June 2026)

Student 2's account shows that understanding a Chemistry concept does not always mean that a student can explain it clearly in an examination. The student understood the concept but struggled to find the words needed to describe it. In such cases, the written answer may not fully communicate what the student knows. This difficulty may affect performance in questions that require students to explain scientific concepts rather than simply identify or recall facts.

A similar difficulty was raised by Student 8 during FGD 12:

"I may know the process, but explaining each step using English words becomes difficult, so I write short answers." (Student 8, FGD 12, June 2026)

This response suggests that difficulties in English writing may lead some students to give shorter answers than the questions require. In Chemistry, students are often expected to describe processes step by step, explain chemical reactions, and give reasons for particular outcomes. When students struggle to explain each step in writing, they may leave out important information. Their answers may therefore be incomplete, even when they have some understanding of the process. The account also suggests that students need opportunities to practise explaining Chemistry concepts in writing, rather than concentrating only on recalling scientific facts or performing calculations.

The interviews with Heads of Schools revealed similar concerns. HoS 3 from School C observed that *"some students understood Chemistry concepts but failed to explain them clearly in writing"* (HoS 3, School C, June 2026). This response

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from HoS 3 in School C supports the students' accounts of the difficulties they experienced when expressing scientific ideas. It suggests that some students had difficulty putting their understanding into words that clearly communicated the intended meaning. As a result, their written answers might not show the full extent of their understanding. However, the interview finding does not establish that English writing difficulties were the only reason for unclear answers.

Further evidence came from the analysis of Form III students' Chemistry examination scripts at School D. The scripts showed difficulties in providing complete answers, using appropriate scientific terminology, and explaining calculation procedures. These difficulties were evident in the written responses presented in Figure 1.

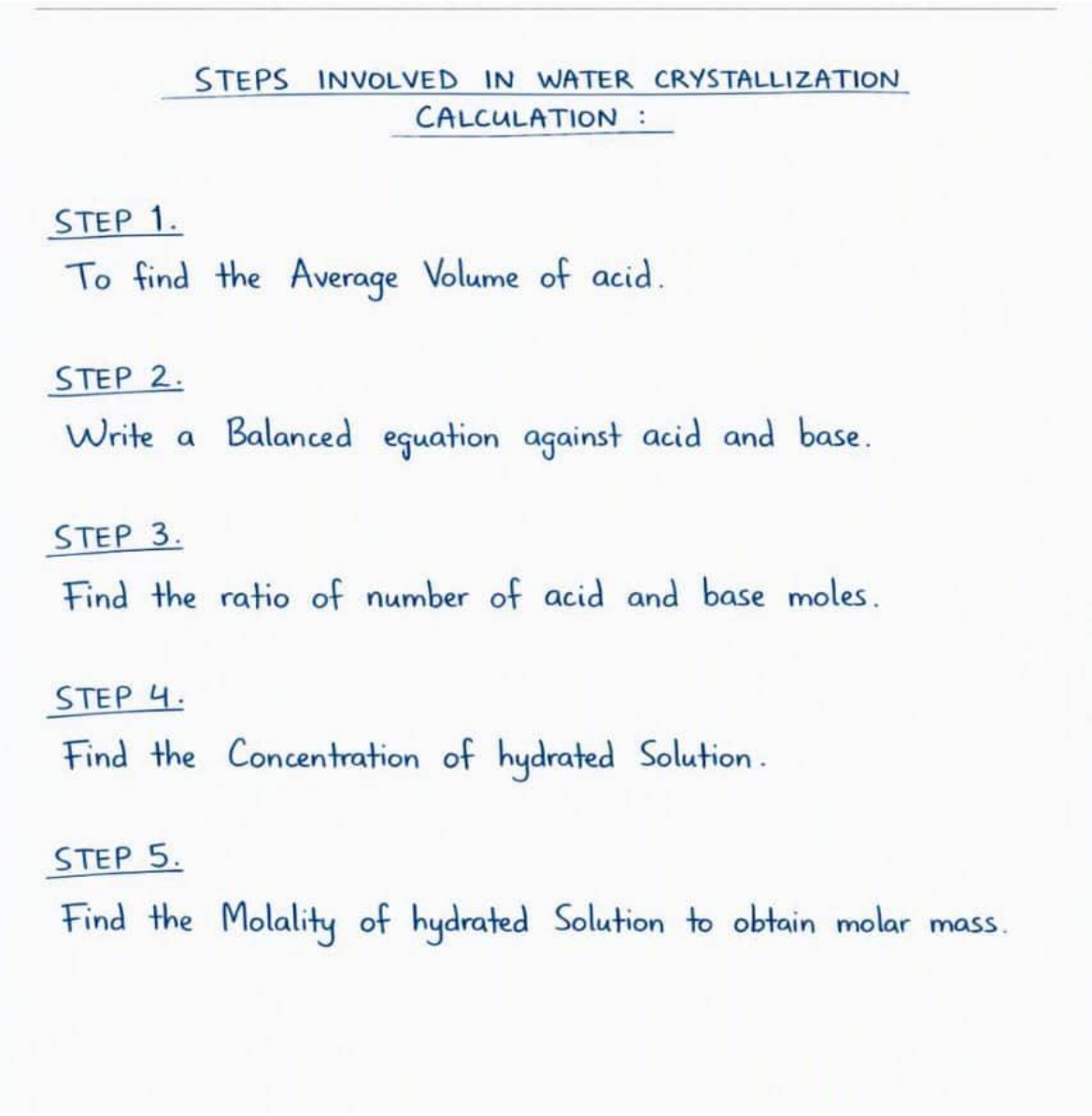


Figure 1: Form III Student's Chemistry Examination Script, School D

Source: Field Data, 2026

Figure 1 presents a student's Chemistry examination response with some difficulties in explaining scientific ideas clearly. Although the student showed some understanding of the calculation steps, the explanations were incomplete and included inappropriate scientific terminology. For example, the student used "hydrated solution" instead of "hydrated salt." This choice of words may indicate difficulty using the correct Chemistry terminology. The instruction "find the molarity to obtain molar mass" was also unclear because it did not explain the calculation procedure or how the two quantities were related in the question. These examples show how unclear wording can make it difficult to follow a student's explanation.

The student's examination script in School D also shows the importance of explaining calculation procedures, rather than simply writing the steps involved. Students need to communicate their reasoning clearly so that examiners can understand how they arrived at an answer. In this case, the incomplete explanations and use of scientific terminology made parts of the response difficult to understand. This supports the interview and focus group findings that some students struggle to express their Chemistry knowledge in written English. However, the script alone does not show whether these difficulties arose from problems with English writing, limited understanding of Chemistry, or both.

4.2.2.2 Writing Skills and Clarity of Chemistry Examination Responses

The findings showed that some students had difficulties expressing their Chemistry knowledge clearly in written examinations. During focus group discussions, students explained that they sometimes understood what was taught in class but struggled to explain it in English when answering examination questions. Student 3 from FGD 11 explained:

"I understand the topic when the teacher is teaching, but during examinations I fail to explain the answer in English and end up writing only a few points." (Student 3, FGD 11, June 2026)

Student 3's response shows the difficulty the student experienced when transferring classroom understanding into a written examination answer. Although the student could follow the lesson, expressing the same ideas in English during examinations was a challenge. As a result, the student sometimes provided only a few points instead of a fuller explanation. This suggests that difficulties in written English may affect how much of their Chemistry knowledge students are able to communicate in examinations.

A similar concern emerged in FGD 6, where Student 1 stated:

"There are questions where I know what the answer should be, but I do not know how to write it correctly, so my response becomes incomplete." (Student 1, FGD 6, June 2026)

This student 1's account in FGD 6 points to a problem in expressing ideas rather than simply knowing the answer. The student reported having an idea of what to write but struggling to put it into words. In Chemistry examinations, such difficulties may result in answers that contain relevant points but lack the explanations needed to address the question fully. The response suggests that students' ability to write clearly is important when they are required to explain scientific concepts and describe chemical processes.

Classroom observations in School F provided further evidence of these difficulties. During group discussions, some students struggled to express their ideas clearly in English when discussing Chemistry concepts with their classmates. The observation showed that the difficulties were not limited to written examinations; some students also experienced challenges when explaining their ideas orally during learning activities. This may indicate that expressing scientific knowledge in English was a challenge for some students, even when they had opportunities to discuss concepts with their peers. In examinations, where students must write their answers independently, these difficulties may affect the clarity of their responses.

An interview with HoS 4 supported the findings from the student discussions and classroom observations. The Head of School reported that:

"Some students lost marks because they could not explain scientific ideas properly in writing, even though they appeared to understand the concepts during lessons (HoS 4, June 2026).

This response from HoS 4 suggests that some students experienced difficulties demonstrating their understanding through written answers. A student may understand a Chemistry concept during a lesson but struggle to explain it clearly when answering an examination question independently.

The findings from the focus group discussions, classroom observations, and interview with HoS 4 point to a common concern: some students struggled to communicate their Chemistry knowledge clearly in English. Their accounts and observed difficulties suggest that writing skills may affect the clarity and completeness of examination responses. However, these findings do not establish that English writing difficulties alone account for students' performance, since their understanding of Chemistry concepts may also influence the answers they provide.

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4.2.2.3 Writing Skills and Organisation of Scientific Ideas in Chemistry Answers

The findings showed that some students experienced difficulties arranging their ideas when answering Chemistry examination questions. During focus group discussions, students explained that they sometimes knew the answer but struggled to present their points in the correct order. Student 6 from FGD 4 explained:

"Sometimes I know the answer, but I fail to arrange the points properly, so my explanation becomes incomplete even though I understand the topic." (Student 6, FGD 4, June 2026)

Student 6's response suggests that knowing the Chemistry content does not always enable students to present a complete answer. The student described a difficulty in arranging ideas, which affected the explanation. When answering Chemistry questions, students need to identify the relevant points and present them in an order that makes their meaning clear. If the points are poorly arranged, some information may be left out or the explanation may be difficult to follow. This may affect how well students communicate their understanding in examinations.

Another student in FGD 1 added:

"When the question requires many steps, it becomes difficult to write everything in the correct order, and sometimes important points are left out." (Student 5, FGD 1, June 2026)

Student 5's response in FGD 1 shows that arranging information becomes particularly challenging when a question requires several steps. In Chemistry, students may need to explain a chemical reaction, describe an experimental procedure, or show the stages involved in solving a calculation. When these steps are not presented in the correct order, the explanation may become unclear. Leaving out important points may also make the answer incomplete. The student's response therefore suggests that organising written information is an important part of answering Chemistry questions that require detailed explanations.

The interviews with Heads of Schools provided further evidence of this problem. HoS 10 explained: *"Some students presented correct Chemistry information in a confusing order, which resulted in the loss of marks"* (HoS 10, June 2026). This information from HoS 10 means that some students knew relevant scientific facts but had difficulties arranging them clearly in their written answers. When ideas are presented without a clear sequence, the examiner may struggle to follow the explanation or understand how the points relate to one another. Thus, the way students organise their answers may affect how effectively they demonstrate their Chemistry knowledge.

Another Head of School A stated: *"Students who arranged their answers step by step performed better because their explanations were easier to follow"* (HoS 1, June 2026). This account from HoS 1 shows the importance of presenting information in a logical order. For example, explaining the stages of a chemical process in sequence helps the reader understand how one step relates to the next. The Head of School's response suggests that well-organised answers make students' reasoning easier to follow, while poorly organised responses may obscure relevant information.

The findings from the student discussions and interviews with Heads of Schools suggest that some students struggled to organise scientific ideas when answering Chemistry examination questions. While some students reported knowing the answers but having difficulty arranging their points, the Heads of Schools also observed differences in the way students presented their responses. These findings suggest that students need to develop the ability to organise their ideas alongside their understanding of Chemistry concepts. Nevertheless, the findings do not establish that difficulties in organisation result solely from English writing skills, since students' understanding of the subject matter may also affect how they structure their answers.

5. DISCUSSION OF THE FINDINGS

The findings suggest that English writing skills are important in how students communicate their Chemistry knowledge in written examinations. Most Chemistry teachers agreed that students' writing skills were related to their ability to explain concepts, organise answers, use appropriate scientific terminology, and provide complete responses. The qualitative findings help explain these responses. Some students reported that they understood Chemistry concepts but struggled to express their ideas in English. Heads of Schools also observed that some students had difficulties explaining scientific ideas and arranging their answers clearly. The examination scripts provided further examples of incomplete explanations and inappropriate scientific terminology. These findings suggest that some students may have difficulties demonstrating what they know because they struggle to express it in writing. However, the difficulties observed cannot be attributed to English

writing skills alone. Students' understanding of Chemistry concepts and their familiarity with scientific terminology may also affect the quality of their answers. Therefore, students' written examination responses need to be considered in relation to both their understanding of Chemistry and their ability to communicate that understanding in English.

These findings are consistent with Graham et al. (2022), who reported that writing proficiency helps learners organise and communicate knowledge within different subject areas. In the present study, some students reported knowing the answers to Chemistry questions but struggling to explain them clearly in English. This difficulty sometimes resulted in short or incomplete responses. Similarly, Gupte et al. (2021) found that stronger writing abilities were associated with more coherent scientific explanations. This is relevant to the present findings, particularly where students struggled to explain chemical processes and arrange their ideas in a logical order. However, writing ability alone may not account for the quality of a scientific explanation because students also need to understand the concepts they are explaining. Kinyero et al. (2024) and Xodabande et al. (2023) likewise reported that difficulties with academic and disciplinary language can affect students' ability to demonstrate their science knowledge during assessment. The present study adds to these findings by showing how such difficulties appeared in Chemistry learning and examination responses in public secondary schools in Morogoro Municipality. The student accounts and examination scripts suggest that some students had difficulties putting their Chemistry knowledge into words, although the available evidence does not establish that writing difficulties were the only reason for their incomplete answers.

The findings can also be understood in relation to Cummins' Cognitive Academic Language Proficiency (CALP) theory. The theory distinguishes the language skills used in everyday communication from those required for academic tasks. Chemistry examinations often require students to explain scientific processes, describe observations, justify answers, and show relationships between concepts. These tasks require students to communicate ideas using appropriate terminology and clear written explanations. The students' accounts illustrate some of the difficulties they experienced when attempting to meet these demands. For example, some reported that they understood Chemistry concepts but could not explain them fully in English, while others struggled to arrange their answers in the correct order. These findings are consistent with the view that academic language proficiency is important when students are required to communicate complex ideas in writing. In this study, CALP theory helps explain why difficulties with academic English may affect how students present their Chemistry knowledge in examinations. Nevertheless, the findings also indicate that writing skills should not be considered separately from students' understanding of Chemistry, since both may influence the answers they produce.

6. CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The study concludes that English writing skills make an important contribution to students' ability to answer Chemistry examination questions effectively in public secondary schools in Morogoro Municipality. The findings show that students' ability to organise written responses, use appropriate scientific language, explain Chemistry concepts, and provide complete answers is influenced by their English writing competence. Although some students demonstrated an understanding of Chemistry concepts, difficulties in expressing, organising, and explaining their ideas in written English limited their ability to demonstrate that knowledge fully in examinations. Therefore, Chemistry performance is influenced not only by students' conceptual understanding but also by their ability to communicate scientific knowledge clearly, coherently, and accurately in English. In line with CALP Theory, the study concludes that strengthening students' academic and scientific English writing skills is important for enabling them to demonstrate their Chemistry knowledge effectively in written examinations.

6.2 Recommendations

For Chemistry Teachers: Chemistry teachers should adopt language-supportive teaching approaches that help students express Chemistry concepts clearly in written English. Teachers should provide support in scientific vocabulary, sentence construction, organisation of ideas, and explanation of Chemistry processes. They should also provide regular writing exercises that require students to explain concepts, describe procedures, interpret results, and give reasons using appropriate scientific terminology.

For Heads of Schools: Heads of Schools should strengthen supervision and support for Chemistry teachers in addressing students' English writing difficulties. They should encourage teachers to use students' written responses and examination scripts to identify difficulties in clarity, organisation, scientific terminology, and completeness of answers.

For Schools: Schools should establish writing competitions, such as essay-writing competitions and other academic writing activities, to provide students with regular opportunities to practise expressing and organising ideas in English. Schools should also encourage collaboration between Chemistry and English teachers to strengthen students' academic and scientific writing skills.

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