INTEGRATIVE LANGUAGE TEACHING TO STUDENTS OF CHEMISTRY FACULTY

Dadabayev Zafar Zakirovich

Teacher, Namangan State Pedagogical Institute

Tel: +99893 493 5885

Abstract. The integration of English language instruction within chemistry education, often referred to as Content and Language Integrated Learning, presents a dual advantage for students. This approach not only enhances English proficiency but also deepens understanding of chemistry concepts. The thesis "Teaching English Integratively to Chemistry Students" explores how CLIL methodologies can be effectively employed in chemistry classrooms, emphasizing the coequal importance of language and content learning. By developing lesson plans that intertwine English language skills with chemistry topics, such as 'Chemistry in Everyday Life,' the research aims to motivate students and diversify their learning experiences. The findings suggest that this integrative teaching strategy not only supports language acquisition but also fosters critical thinking and problem-solving skills essential for scientific literacy in an increasingly globalized world.

Key words: integration, metodology, chemistry-related tasks, academic and professional life, pharmaceuticals, environmental science.

INTRODUCTION

The increasing role of English as the global language of science and technology makes it essential for students in chemistry faculties to develop strong English proficiency. Chemistry students must engage with scientific literature, communicate their research findings, and collaborate with international peers, all of which require a solid foundation in English. However, traditional English language teaching often fails to address the specific needs of students in specialized fields.

Integrative language teaching, which blends English instruction with subject-specific content, offers a more effective approach. By integrating language skills with chemistry-related tasks, students can improve their English proficiency while simultaneously deepening their understanding of chemistry. This article explores the importance of English for chemistry students, discusses effective integrative teaching methods, and examines challenges along with potential solutions.

THE IMPORTANCE OF ENGLISH FOR CHEMISTRY STUDENTS

Chemistry is a highly technical and research-driven field that relies on precise communication. Many aspects of a chemist's academic and professional life require proficiency in English, including:

1. Access to Scientific Knowledge. Most scientific literature, including research articles, journals, and textbooks, is published in English. Chemistry students must be able to read, interpret, and critically analyze these materials to stay updated with the latest developments in their field. Without sufficient English skills, students may struggle to access cutting-edge research, limiting their academic growth.

2. Participation in International Conferences and Research. Chemists often attend international conferences where English is the primary language. Presenting research findings, engaging in discussions, and networking with other scientists all require effective communication skills. A lack of English proficiency can hinder students' ability to present their work confidently or participate in meaningful scientific exchanges.

3. Writing Scientific Papers and Reports. Publishing research is a crucial part of a chemist’s career. Writing articles, lab reports, and research papers in English is a fundamental skill for students aspiring to contribute to the global scientific community. Mastering academic writing conventions, technical vocabulary, and proper grammar ensures clarity and professionalism in scientific communication.

4. Career Opportunities in Science and Industry. Many chemistry-related careers, whether in academia, pharmaceuticals, environmental science, or industrial research, require strong English skills. Multinational corporations and research institutions often use English as their working language. Without proficiency in English, chemistry graduates may find their career prospects limited.

Given these factors, an integrative approach to teaching English, tailored specifically for chemistry students, is necessary to equip them with the skills they need to succeed.

METHODS

An integrative approach to teaching English for chemistry students involves combining language instruction with subject-specific content. This method ensures that students acquire both general and specialized language skills in a meaningful context. Several teaching strategies can be used to achieve this integration.

1. Content-Based Instruction (CBI). CBI involves teaching English through subject-related content rather than as a separate subject. In this approach, chemistry topics serve as the foundation for language learning. Lessons may include: reading and summarizing chemistry articles, writing lab reports and research papers, analyzing scientific data in English.

By engaging with real-world chemistry content, students improve their English skills while reinforcing their subject knowledge.

2. Task-Based Learning (TBL). TBL focuses on practical activities that mimic real-life scientific tasks. Instead of traditional grammar exercises, students engage in chemistry-related projects that require English communication, such as:

Conducting and explaining experiments – Students describe their procedures, discuss observations, and present findings in English.

Collaborative problem-solving – Groups of students work together to solve chemistry-related problems, discussing their ideas and reasoning in English.

Creating instructional materials – Students write step-by-step guides or safety instructions for laboratory procedures.

TBL provides students with opportunities to use English in a meaningful way while engaging in scientific inquiry.

3. Communicative Language Teaching (CLT). CLT emphasizes interaction and real-world communication. Teachers can encourage discussions, debates, and presentations on chemistry-related topics. Some effective activities include: peer discussions on scientific discoveries – students read about recent breakthroughs in chemistry and discuss their implications; role-playing scenarios – students act as researchers explaining their work to a general audience or presenting at a scientific conference; debates on scientific ethics – topics such as environmental impact, chemical safety, or pharmaceutical ethics can stimulate critical thinking and communication skills.

By focusing on communication rather than rote memorization, CLT helps students develop fluency and confidence in using English.

4. Using Authentic Materials. Authentic materials expose students to real-world language use in chemistry. Examples include:

Research papers from scientific journals.

Safety manuals and laboratory guidelines.

Chemistry-related TED Talks, documentaries, and podcasts.

Teachers can design exercises based on these materials, such as summarizing articles, analyzing data, or writing responses to scientific debates.

5. Technology Integration. Digital tools can enhance language learning and subject comprehension. Some effective strategies include:

Using online databases – Encouraging students to read chemistry articles from sources like ScienceDirect or ACS Publications.

Virtual labs and simulations – Platforms like PhET Interactive Simulations provide hands-on learning experiences with English instructions.

Video lectures and MOOCs – Websites like Coursera and edX offer chemistry courses in English, allowing students to improve their language skills while learning subject content.

By integrating technology, students gain exposure to scientific English in diverse contexts, reinforcing both language and subject knowledge.

RESULTS

While integrative English teaching offers many benefits, it also presents certain challenges. Addressing these challenges requires targeted strategies.

1. Limited English Proficiency. Many chemistry students have difficulty understanding complex scientific texts or expressing themselves clearly in English. Solution: provide glossaries of key chemistry terms; use simplified explanations and guided reading strategies; incorporate language scaffolding techniques, such as sentence starters and structured templates.

2. Lack of Motivation. Some students perceive English as irrelevant to their field and may lack motivation to learn it. Solution: demonstrate real-life applications of English in chemistry careers; invite guest speakers (scientists or industry professionals) to discuss the role of English in their work; design engaging activities, such as chemistry-based storytelling or creative writing tasks.

3. Balancing Language and Content Learning. Focusing too much on English may take time away from chemistry studies, while focusing only on

chemistry can limit language development. Solution: develop interdisciplinary lessons that seamlessly integrate both components; use a gradual approach, starting with simpler language tasks and progressively increasing complexity.

4. Resistance to Active Participation. Some students may feel uncomfortable speaking or writing in English. Solution: create a supportive learning environment that encourages risk-taking; use peer collaboration to reduce anxiety and build confidence; offer constructive feedback to help students improve without discouragement.

CONCLUSION

Teaching English integratively to chemistry students is essential for preparing them for academic and professional success. By using content-based instruction, task-based learning, communicative methods, authentic materials, and technology, educators can create an effective and engaging learning environment.

Although challenges such as limited English proficiency and lack of motivation exist, targeted strategies can help overcome these obstacles. When chemistry students see the relevance of English in their field and engage in meaningful learning experiences, they develop the language skills necessary to excel in their careers.

By embracing an integrative approach, educators can ensure that chemistry students not only learn English but also become confident communicators in the global scientific community.

REFERENCE

1. Brown, H. D. (2007). Principles of language learning and teaching. Pearson Education.
2. Celce-Murcia, M., & Larsen-Freeman, D. (1999). The grammar book: An ESL/EFL teacher's course (2nd ed.). Heinle & Heinle.
3. Harmer, J. (2007). The practice of English language teaching. Pearson Education.

4. Lightbown, P. M., & Spada, N. (2013). How languages are learned (4th ed.). Oxford University Press.
5. Richards, J. C., & Rodgers, T. S. (2014). Approaches and methods in language teaching (3rd ed.). Cambridge University Press.
6. Scrivener, J. (2011). Learning teaching: The essential guide to English language teaching. Macmillan Education.
7. Larsen-Freeman, D. (2000). Techniques and principles in language teaching (2nd ed.). Oxford University Press.
8. Abdusamatovna, I. S. (2023). PROCESS AND CRITERIA OF TEACHING LISTENING. *International journal of advanced research in education, technology and management*, *2*(3).
9. Balaji, V., Padala, S., Josh, S. K., Muhsen, M., Singh, S., Isroilova, B., & Israilova, D. (2024). Finite element analysis of double pipe heat exchanger using nanofluids. In *E3S Web of Conferences* (Vol. 563, p. 01004). EDP Sciences.
10. Khursheed, S., Sharma, S., Paul, V. K., Alzubaidi, L. H., & Israilova, D. (2024). Review of the factors inducing delay in construction project material management. In *E3S Web of Conferences* (Vol. 563, p. 02044). EDP Sciences.
11. Rustamova, N., Inoyatova, S., Madazizova, D., Israilova, D., & Israilov, S. (2024). Genetically modified ecosystems: Innovative approaches in agriculture and their environmental impact. In *BIO Web of Conferences* (Vol. 149, p. 01063). EDP Sciences.
12. Umbarov, I., Karimov, F., Karimov, Z., Bekkamov, M., Ubaydullayev, A., Eshkuvatov, E., & Israilova, D. (2024). Gravity grain cleaning machine and its importance in grain logistics and sustainable agriculture. In *BIO Web of Conferences* (Vol. 105, p. 06016). EDP Sciences.