COGNITIVE FEATURES OF STUDENTS IN TECHNICAL UNIVERSITIES IN LEARNING ENGLISH: PSYCHOLINGUISTIC ASPECTS

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Abstract

This article explores the psycholinguistic and cognitive features of students at technical universities in the process of learning English. Considering the specifics of engineering thinking, the focus is placed on the logical-analytical approach to linguistic material, the predominant use of the left hemisphere of the brain, and a tendency toward rational information processing. The study analyzes learning barriers related to a low level of language intuition and limited communicative flexibility. Methodological techniques are proposed to optimize the learning process and adapt it to students' cognitive profiles.

Keywords: cognitive styles, technical thinking, psycholinguistics, English language teaching, university students, cognitive strategies.

Introduction

In the era of globalization and technological advancement, proficiency in English has become a critical component of professional success, particularly for students in technical universities. As the lingua franca of international research, engineering, and digital communication, English is no longer simply a foreign language—it is a key to accessing global knowledge systems, participating in cross-border collaborations, and contributing to innovation-driven economies. However, teaching English to students in technical disciplines presents a unique set of challenges and requires a nuanced understanding of their cognitive and psycholinguistic profiles.

Unlike students in the humanities or social sciences, technical students are often characterized by a preference for structured, logical, and systematized modes of

thinking. Their academic background tends to reinforce analytical reasoning, procedural problem-solving, and schematic processing of information.

From a psycholinguistic standpoint, these learners may exhibit imbalances between receptive and productive skills, a high dependency on deductive learning strategies, and difficulties in navigating the ambiguity and idiomaticity of natural language. In addition, affective factors such as anxiety, perfectionism, and low communicative self-efficacy often hinder active participation in language use, even when cognitive understanding is present. These challenges are further compounded by traditional teaching models that do not always align with the cognitive preferences or learning motivations of technical students.

The field of psycholinguistics offers valuable insights into how mental processes such as perception, memory, attention, and problem-solving interact with language acquisition. By examining the cognitive styles and processing mechanisms of technical students, educators can develop more targeted and effective pedagogical strategies. This includes recognizing the role of the left and right hemispheres of the brain in language learning, understanding how students process and store linguistic input and identifying barriers that prevent the transfer of linguistic competence into real-world communication.

This article aims to explore the cognitive and psycholinguistic characteristics of students in technical universities and how these factors influence their approach to learning English. It will identify common barriers to successful language acquisition, analyze the underlying mental processes involved, and propose instructional strategies tailored to their unique learning profiles. The goal is to contribute to the development of a more effective and empathetic language education framework—one that empowers technical students not only to learn English, but to use it confidently and creatively in academic, professional, and intercultural contexts.

1. Psycholinguistic and Cognitive Characteristics of Technical Students

1.1 Logical-Analytical Thinking Style

Students in technical fields typically rely on logical-analytical strategies. They prefer clear rules, structured material, and a systematic approach to learning. This manifests, for instance, in a stronger focus on grammar over communicative practice.

1.2 Tendency toward abstract thinking

Engineering education fosters abstract modeling and structured information processing. However, this can hinder the comprehension of emotionally charged expressions or figurative language in English.

1.3 Preference for visual-logical representation

Students tend to absorb information more effectively when it is presented through charts, tables, and diagrams. Technical learners more easily acquire specialized vocabulary when it is visualized or embedded in a technical context.

2. Psycholinguistic barriers in learning English

2.1 Low level of language intuition

Many technical students struggle in situations requiring quick linguistic responses. This is often due to insufficient automatisation of skills and a desire to be “correct” rather than spontaneous in communication.

2.2 Difficulty in acquiring idiomatic expressions

Due to their logical mindset, students often perceive idioms and phrasal verbs as illogical or opaque, which impedes the development of natural language comprehension.

2.3 Limited communicative flexibility

Technical education does not always contribute to the development of sociolinguistic intuition, which is crucial for effective communication in diverse cultural and conversational contexts.

3. Methodological recommendations

- **Use of Schemes and Algorithms**: Teaching materials based on visual models help students grasp grammar and vocabulary more effectively.
- **Integration of Technical Contexts**: Language material should be introduced through technical topics (e.g., project presentations, manuals, scientific texts).
- **Speech Simulators and Role Plays**: These enhance students' communicative flexibility and intuitive language use.
- **Emphasis on Metacognitive Strategies**: Training students to be aware of their cognitive preferences and to use reflection and self-regulation in the learning process.

Conclusion

The exploration of psycholinguistic and cognitive features of students in technical universities underscores the urgent need for differentiated approaches in English language instruction. These learners possess distinctive mental frameworks shaped by their technical disciplines—frameworks that prioritize logic, structure, and problem-solving. While these traits offer certain advantages in mastering rule-based language components such as grammar and terminology, they simultaneously pose challenges when it comes to intuitive, fluid, and socially adaptive language use.

The overreliance on left-hemispheric processing often leads to a mechanistic perception of language, where meaning is sought through rules and systems rather than context or nuance. As a result, technical students may demonstrate strong passive knowledge but limited active communicative skills. This discrepancy creates a gap between their linguistic competence and their actual communicative performance—particularly in environments requiring quick adaptation, idiomatic comprehension, and intercultural sensitivity.

Moreover, the psycholinguistic barriers experienced by these learners are not solely cognitive in nature but also emotional and motivational. Fear of making mistakes, perfectionism, and anxiety in unpredictable communication settings can

impede progress. Without targeted pedagogical intervention, such barriers may persist, leading to a disengaged or inefficient learning experience.

Therefore, it becomes essential for educators to design instruction that not only leverages students' cognitive strengths—such as their analytical reasoning and abstract modeling—but also compensates for their weaknesses by cultivating communicative spontaneity, sociolinguistic awareness, and metacognitive self-regulation. Methods such as task-based learning, contextualized vocabulary development, speech automation exercises, and emotional-cognitive training (e.g., mindfulness in communication) can help bridge the gap between knowledge and performance.

In the broader context of global education and workforce integration, English proficiency for technical specialists is no longer optional—it is a prerequisite for participation in international projects, research collaboration, and industry innovation. Hence, developing psycholinguistically informed teaching practices is not merely a pedagogical refinement but a strategic necessity.

In conclusion, only by acknowledging and actively addressing the cognitive and psycholinguistic dimensions of technical students can educators fully unlock their potential in English language learning. This approach transforms English not into an abstract academic requirement, but into a functional, applicable tool for personal, academic, and professional development in the global knowledge economy.

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