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Neurolinguistics and the Brain Rot of Language Addressing Post Pandemic Challenges in Teaching ESP for Business to First Year University Students

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Abstract

This paper explores the neurolinguistic foundations of language learning and the cognitive challenges faced when teaching English for Specific Purposes (ESP) to first-year business students in a post-COVID-19 educational landscape. It investigates how key brain structures responsible for language, memory, and emotional regulation are affected by what is colloquially referred to as "brain rot", a decline in cognitive efficiency and motivation seen in many post-pandemic learners. Drawing on current neurolinguistic research, this paper argues that integrating brain-compatible strategies, particularly visual exercises and retrieval-based tasks like multiple-choice quizzes, can enhance motivation, memory retention, and comprehension of abstract business terminology.

Keywords: Neurolinguistics, ESP for Business, Brain Rot, HEI Education

1. Introduction

As English continues to dominate international business, the need for English for Specific Purposes (ESP) instruction in business faculties has surged. ESP courses aim to prepare students for real-world professional communication by focusing on terminology, discourse structures, and pragmatic skills specific to business contexts [1]. However, teaching ESP for Business to first-year university students presents significant pedagogical challenges. Many students come from general English backgrounds with very diverse degrees of basic English knowledge and limited exposure to business-specific language, thus facing a cognitive overload when introduced to specialized terminology, complex syntactic structures, and abstract concepts. In the post-pandemic context, these challenges have been exacerbated by the onset of behavioral issues such as depression, anxiety, and many other psychological disorders for which neither teachers nor students have been prepared. On one hand, many teachers struggle to engage with their students and to create meaningful modules that prepare the young generation for the labor market. On the other hand, more and more students report increased mental fatigue, lower concentration, and reduced memory capacity, a condition popularly referred to as "brain rot." Though informal, this term reflects widespread neurological and psychological symptoms stemming from disrupted learning environments, reduced social engagement, and the cognitive effects of COVID-19 itself [2,3]. Although the pandemic ended almost three years ago, its effects on academia and the way we teach in HEIs are still very palpable and here to stay, which begs for long-term and clear solutions. To this end, this paper argues that neurolinguistics, the study of how the brain processes language, offers critical insights into teaching-learning difficulties. By understanding the neurological "roots" of language learning and how they have been affected post-pandemic, teachers can develop brain-aligned strategies to support first-year ESP students more effectively, all while building a safe environment for all parties involved in the educational process.

2. Neurolinguistics and the Brain Root of Language Learning

Language is processed through a distributed neural network involving both hemispheres and multiple cortical regions [4]. Core areas include Broca's Area (left inferior frontal gyrus), which deals with syntax and speech production; Wernicke's Area (posterior superior temporal gyrus), in charge of semantic processing and comprehension; the hippocampus, which encodes new vocabulary and transfers information into long-term memory; the dorsolateral prefrontal cortex, facilitating executive functioning, attention, and working memory; as well as the right hemisphere and visual cortex

that manage interpreting tone, metaphor, and visual/spatial cues [5,6]. These structures form the "brain root" of language acquisition and use. Whenever any of these parts' functioning abruptly faces malfunctions, an overall disequilibrium sets in. If not put in check, the latter can affect individuals' perception of reality and their relationship systems accordingly. In other words, our communication capabilities are altered to the point that we are no longer able to produce or exchange coherent messages.

In ESP instruction, particularly in business contexts, effective learning hinges on the integration of verbal, semantic, and contextual processing. However, many ESP syllabi nowadays still prioritize rote learning and text-heavy materials that underutilize visual and contextual encoding systems. Post-pandemic, we have noted that students are unable to process texts that are more than two paragraphs long, and it takes them three times the expected time to focalize, examine, and answer text-based questions. When interrogated about their difficulties, two out of five students will complain of text difficulty, i.e., density, grammar, and unknown vocabulary. Business English, unlike general English, introduces abstract terms such as "leverage," "shares," or "capital expenditure" that present greater challenges for neurological learning. Concrete words activate broad sensory-motor networks, making them easier to remember, while abstract words require pre-existing semantic scaffolds, which many first-year students lack [7]. With the digitalization in education, students no longer invest time in understanding a text structurally, piece by piece, because a program can provide them with the correct answer without delay. While general English, once acquired, can provide learners with clear, repetitive patterns of communication, ESP in the business context relies on "subtitles" without exception. Persuasion in negotiation, critical analysis, and presentation of data, or simply daily business contexts where one has to build long-term relationships based on trust, require the use of specific verbal and non-verbal communication techniques that first-year students do not understand because they experience a continual decline in mental clarity.

3. Brain Rot and the Post-COVID Cognitive Landscape

The term "brain rot," which was selected as the Oxford Word of the Year in 2024, although colloquial, encapsulates cognitive symptoms that students have widely reported experiencing after the pandemic: mental fog, low motivation, poor memory, and shortened attention spans. Neurologically, these effects can be linked to COVID-related inflammation affecting brain regions involved in attention and memory, long COVID symptoms reducing cognitive speed and mental stamina, and social isolation and stress impairing the prefrontal cortex and hippocampus [8,9]. Yet, even students who have not suffered from COVID-19 show these symptoms, and these impairments directly impact their ability to learn domain-specific language. In ESP Business classrooms, we can observe that learners often become overwhelmed by simultaneous demands on language, cognition, and executive function. Without a cognitive framework, learners are more likely to disengage, forget key vocabulary, or fail to apply language appropriately in context. Hence, the lack of the well-known and well-sought-after soft and multitasking skills is now, more than ever, blocking students' willingness to move forward with their studies.

According to the AmCham Report, between 2013 and 2021, in cohort, roughly 23,147 business students decided to drop out of economic programs and rethink their professional paths. What is more, the rate is slowly but steadily increasing. Some students opt to take up an internship or a short-term job to somehow force experience into place. Nonetheless, since this is not the norm and is quite looked down upon in Romanian culture, many students prefer living off their parents' backs until they are in their late 20s. As the AmCham Report shows, "Romania has the lowest adult education rates in the EU with a participation of 1% in 2020, 5.7% in 2022, and 6.7% in 2023 among people aged 25 – 64." So, what can we do?

4. Motivation and Affective Filters

Neurolinguistic models of education underscore the indispensable role of emotion and motivation in successful learning processes. The brain processes information, while emotions shape the learning process itself, rather than serving as a passive receiver. The limbic system, and more specifically the amygdala, is central to this understanding as it regulates emotional responses and plays a key role in determining how information is prioritized for memory consolidation [10]. In high-stress or low-engagement environments, the brain's natural defense mechanisms activate, which result in the elevation of what Stephen Krashen famously termed the affective filter [11]. When this filter is raised, due to anxiety, boredom, or perceived irrelevance, comprehensible input fails to be processed effectively, resulting in impaired acquisition and disengagement. This phenomenon is particularly visible among first-year students enrolled in Romanian business programs. National data and institutional reports increasingly point to concerning dropout rates during the first academic year, a critical transition phase often marked by motivational instability. One underexplored but significant contributing factor lies in the emotional and motivational disconnect students experience in language courses, especially English for Specific Purposes (ESP).

Despite the growing importance of English proficiency in the globalized business world, many Romanian students report feeling that ESP courses are detached from their personal goals and professional aspirations. This lack of perceived relevance significantly undermines students' motivation, which, according to Deci and Ryan's Self-Determination Theory, is a foundational pillar of sustainable learning [12]. When students do not understand the practical application of the content, or when the delivery fails to engage them emotionally, they begin to disengage cognitively. ESP classes often become a mere academic formality, just another credit to be earned rather than an empowering skill-building experience. Traditional ESP materials, often rigid and outdated, exacerbate this issue. These resources tend to focus heavily on decontextualized business terminology and

overly formal communication structures, while neglecting the dynamic, interpersonal, and intercultural aspects of modern business communication. Moreover, the one-size-fits-all format of many ESP textbooks fails to account for students' diverse learning styles and emotional needs. As a result, learners are confronted with abstract content presented in formats that are neither brain-friendly nor emotionally resonant. The consequence is a classroom climate where learners feel cognitively overwhelmed and emotionally under-stimulated.

5. Brain-Aligned Teaching Strategies for ESP

This dissonance between course content and learner identity has profound implications. As studies in educational psychology suggest, motivation is not simply a fixed trait but a dynamic state that can be nurtured or stifled by contextual factors. In the Romanian context, where many students face economic hardship, social pressure, and unclear professional pathways, classroom experiences become critical motivational touchpoints. A course that fails to inspire or demonstrate clear value may inadvertently contribute to the students' decision to abandon their academic path altogether. To mitigate these outcomes, I believe that a paradigm shift in ESP instruction is urgently needed. Language teaching must become emotionally intelligent, responsive to student interests, and strategically tied to real-world business practices. This includes the integration of multimodal resources, authentic case studies, simulations, collaborative projects, and digital tools that reflect the dynamic nature of today's business environments. Additionally, fostering a supportive classroom climate where learners feel safe to express themselves and take risks can significantly lower affective filters, thereby enhancing both language acquisition and learner retention.

As such, it is essential for ESP instructors and curriculum designers to recognize themselves not just as language educators, but as motivational architects. By aligning content with students' personal and professional narratives and by intentionally addressing emotional engagement, educators can transform the ESP classroom into a powerful site for both language development and motivational renewal. Such reforms, while pedagogical in nature, may have far-reaching effects, helping to reverse drop-out trends and empower Romanian business students to persist, succeed, and thrive in both their academic and professional journeys. Neurolinguistics suggests that effective ESP instruction must reduce cognitive overload, stimulate multiple sensory pathways, and promote meaningful emotional engagement, as well as creativity and learning through discovery. In order to achieve this, some strategies are more suited to post-pandemic learners than others.

For one, employing visual encoding and dual coding helps activate the visual cortex and right hemisphere, which remain responsive even when language centers are fatigued [6]. Dual coding theory posits that visual and verbal inputs are processed through separate channels, enhancing retention when both are engaged [13]. In this sense, ESP instructors should use infographics such as supply chain diagrams, animated business scenarios, labeled budget templates, or SWOT analyses, and plenty of slides with icons and imagery. Secondly, the use of multiple-choice questions to support recognition-based retrieval, placing less demand on damaged memory circuits while still reinforcing semantic associations is a must. When distributed over time (spaced retrieval), this method strengthens memory traces in the hippocampus and improves long-term retention [14].

Thirdly, teaching vocabulary within authentic business contexts, e.g., case studies, email writing, and marketing pitch simulations, helps anchor abstract terms in familiar scenarios. This engages both prefrontal executive systems and semantic memory networks, making language more meaningful and memorable. If we couple this with offering student's agency, e.g., choosing a company to research or designing their own business pitch, we stimulate motivation and emotional investment. As Immordino-Yang & Damasio put it, emotionally relevant tasks activate the amygdala, increasing the likelihood that content will be encoded and retained [10]. Last but not least, conceptualizing a Brain-Compatible ESP Module is essential for bringing students into focus and making their learning as relevant as possible to hone specific skills for their future jobs. Micro-learning and short-term condensed modules with clear outlines as well as specific outcomes attract more and more students. These modules respond to their need for quick satisfaction and focus on what they know rather than what they need to learn. Brain-Compatible ESP Modules promote hands-on learning techniques that involve everyone and bring HEIs and socio-economic partners closer, accordingly creating dedicated educational-professional development-oriented teams.

Example of a Brain-Compatible ESP Short Module

Week	Theme	Visual Task	Multiple-Choice Task
1	Company Structures	Org chart labeling activity	Identify managerial roles and duties
2	Marketing Concepts	Ad breakdown with icons	Match terms to promotional strategies
3	Financial Vocabulary	Flowchart of budget elements	Define key financial terms
4	Email Communication	Visual template of email formats	Select the appropriate level of formality
5	Business Negotiation	Role-play scenario (with slides)	Choose optimal responses in dialogue options

6. Conclusion

Teaching ESP for Business to first-year students in the post-COVID era requires pedagogical innovation grounded in neurolinguistic science. Cognitive fatigue, memory disruptions, and affective disengagement, all symptoms of the so-called "brain rot", have made traditional teaching models less effective. Neurolinguistics provides a roadmap for overcoming these barriers by aligning instruction with how the brain processes, stores, and retrieves language. By incorporating visual exercises, multiple-choice assessments, and emotionally engaging content, instructors can reduce cognitive overload, enhance motivation, and foster deeper learning. Without clearly structured, student- and market-oriented ESP teaching modules, we will definitely see an increase in academic dropout rates in the next decade. Consequently, brain-compatible ESP teaching is no longer just a theoretical ideal; it is a post-pandemic necessity.

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