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SECOND LANGUAGE ACQUISITION IN TERTIARY EDUCATION: THE ROLE OF NEUROPLASTICITY

This study explores structural and functional brain changes known as neuroplasticity (NP) induced by second language acquisition (SLA). SLA is interpreted as a formal learning of a foreign language within a University curriculum. NP is viewed as a major factor for successful SLA.

The primary objective of this article is to offer a comprehensive review of NP as a neuro-?hysiological phenomenon and illustrate how mastering a new language causes significant brain transformations, hence connecting neuroscientific characteristics to second language (L2), particularly within the context of higher education.

Methods. The study employs an extensive review approach. Specifically, it integrates the fundamental principles of NP, its evolution, interpretations, types and mechanisms, and systemically applies this framework to examine structural and functional brain alterations occurring during SLA.

Results. The conducted review has allowed to infer that the brain is plastic throughout life, contrary to the classical Critical Period Hypothesis (E. Lenneberg). L2 learning causes deep measurable neuroplastic effects at any age period. Structurally, these involve increased grey matter density in important language areas of the brain (inferior parietal lobe, inferior frontal gyrus), improved white matter integrity in pivotal tracts (arcuate fasciculus), and greater cortical thickness. Functionally, SLA is linked to a more bilateral neural network, a tendency towards greater neural efficiency (from effortful frontal to automatic subcortical processing), and the recruitment of such areas as the hippocampus and basal ganglia. These effects are mediated by age, intensity of learning, and to some extent, proficiency of the student.

Scientific Novelty. The study synthetically consolidates the previously undertaken research on NP systematically extrapolating it to the SLA domain. Through organizing available information by specifying, taxonomizing and modelling it, the article develops a framework that bridges the gap between basic neuroscience and applied L2 instruction, providing an integrated resource for researchers and educators alike.

Conclusions. SLA is a potent stimulus of NP, essentially transforming brain structures and functions at any age. It not only facilitates language acquisition (LA) but also strengthens more general cognitive abilities and enhances cognitive potential, protecting against age-related decline. The brain's lifelong propensity for change validates the possibility of student LA and highlights the relevance of brain-based instructional practices for adult learners in University settings.

Implications for Future Research involve the necessity of bridging the divide between neuro-?cience research and classroom practices through targeted pedagogical studies conducted in tertiary education environments. Future investigations might also address the relationship between NP and individual variations in aptitude, motivation and cognitive profiles to create more personalized language learning strategies for University students.

Keywords: *neuroplasticity; second language acquisition; bilingualism; grey matter; white matter; structural and functional plasticity of the brain; cognitive reserve; age of acquisition; language pedagogy.*

The cornerstone of this investigation is the physiological phenomenon of neuroplasticity (NP), which lays the groundwork for expounding the extensive structural and functional brain reorganization induced by second language acquisition (SLA), a process of learning an additional language, even if it is the third or fourth a person learns, which is highly relevant for students undertaking language studies in tertiary education.

First, this study reveals that the process of language acquisition (LA) is a powerful stimulant for NP, triggering significant structural and functional transformations in the brain. Then it exposes how acquiring a new language triggers significant changes within the brain, applying the principles of NP directly to the field of SLA. Finally, it provides evidence-based implications for language instruction, suggesting that understanding the principles of NP can help educators create more effective learning environments and methodologies.

Introduction. NP, also known as brain or neural plasticity, is the brain's ability to change its structure and functions throughout an individual's lifetime (Perwej, Parwej, 2012, p. 5; Jaume, 2023, p. 160). Such a continuous process includes building new neural pathways, strengthening or weakening existing ones, and reorganizing pathways in response to different environmental stimuli (Baiyekusi, Prasad, 2016, p. 56; Kennedy, 2021, p. 2; Perwej, Parwej, 2012, p. 2). These physiological changes can thicken or shrink the grey matter as well as rewire neuron connections (Kumar, 2023, p. 1).

Contrary to the conventional belief that the brain is "hard-wired" or unchangeable due to permanent neural pathways formed during a critical period, the phenomenon of NP firmly proves that the brain is actually changeable (Baiyekusi, Prasad, 2016, p. 56; Nudo et al., 2001; Perwej, Parwej, 2012, p. 2; Carias, 2023, p. 80; Marmarosh, 2023, p. 101; Rum, 2023, p. 1). Voluminous research, particularly since the later half of the 20th century, exposes that the cerebral cortex is highly agile and the brain remains malleable or "plastic" even in adults (Livingston, 1966; Rakic, 2002; Xie, 2024, p. 1; Baiyekusi, Prasad, 2016, p. 56). Structurally, this brain's property involves creating new neural connections (synaptogenesis) and removing neurons that are no longer needed (pruning) (Lin, 2023, p. 224).

Multitudinal studies provide a wide variety of factors that can trigger NP, comprising experience (Abrahamsson, 2017, p. 2), learning (Cramer et al., 2011; Kennedy, 2021, p. 2; Woodward, Waterhouse, 2021), environmental changes (Carias, 2023, p. 80), physical exercise (Hötting & Röder, 2013, p. 2243), sensory deprivation (Bavelier, Neville, 2002; Hötting, Röder, 2013, p. 2244), psychological stress (Zafonte, 2022, p. 445) and brain damage (Kennedy, 2021, p. 1). These changes occur at different levels, including individual cells and synapses (connections between neurons) as well as widespread alterations in the brain structure and function (Kennedy, 2021, p. 2; Adebayo, 2024, p. 30). These data signify that NP is essential for mental development, learning, memory and acquisition of new skills such as mastering languages (Hötting, Röder, 2013, p. 2244; Adebayo, 2024, p. 30). Also, NP is crucial for regeneration after neurological injuries, namely, strokes (Kennedy, 2021, p. 1; Thompson, 2023, p. 1). During recovery, the brain employs healthy neurons from the non-injured areas and grows new nerve cells to compensate for the sustained damage and restore lost functions (Harasym, 2008, p. 339; Afreen et al., 2021, p. 46). However, these changes are not always beneficial. The effects of NP can also be maladaptive and lead to harmful outcomes (Souza et al., 2023, p. 666), as seen in conditions such as phantom limb syndrome (Guimarães et al., 2020, p. 1).

The major goal of this article is to provide a comprehensive review of research focusing on NP and relate it specifically to the area of LA, illustrating how acquiring a new language triggers significant structural and functional changes within the brain.

Methods. The paper undertakes an in-depth scholarly review to integrate the fundamental principles of NP, its evolvement, interpretations, types, mechanisms, and theoretical models. The synthesized knowledge is then systemically applied to examine the structural and functional brain transformations that take place during SLA, with a focus on deriving evidence-based implications for second language (L2) instruction.

Results. Historically, the traditional scientific dogma, which was held throughout the 20th century, portrayed the mammalian nervous system as a "hard-wired" static organ after a critical period of development early in life (Baiyekusi, Prasad, 2016, p. 56; Abrahamsson, 2017, p. 3; Leuner, Gould, 2010; Carias, 2023, p. 80). The assumption was that after that period, the brain could only degrade through cell death and atrophy, which implied that any damage to the adult brain tissue was irreversible (Johansson, 2004; Bosnar, Demarin, 2012, p. 425; Draganski, May, 2008; Hara, 2015; Zafonte, 2022, p. 445). Such a viewpoint of the brain nature was considered standard textbook knowledge up until the 1960s (Grossman, 1967; Hötting, Röder, 2013, p. 2243).

However, this long-standing belief was disputed by pioneering researchers. As far back as 1891, W. James, an American philosopher and psychologist, introduced the concept of "plasticity" in his work *The Principles of Psychology* (1891), and suggested that the brain functions were not static but could continuously change, although his assumptions were largely dismissed at that time (Kleim, Jones, 2008; Warraich, Kleim, 2010; Demarin et al., 2014; Jasey, Ward, 2019, p. 333; Zafonte, 2022, p. 445). Shortly after, in 1893, E. Tanzi, an Italian psychiatrist and neurologist, contributed to this idea by suggesting that experience could alter the synaptic connections in the brain (Tanzi, 1893, p. 469; Berlucchi, Buchtel, 2008, p. 309). The concept was further examined by S. Cajal, a Spanish neuroscientist and pathologist, k?-nown as the "father of modern neuroscience", who proposed in 1894 that mental activity could generate new intercellular connections (Cajal, 1894, p. 466). The researcher employed the term "plasticity" to refer to non-pathological structural changes in the adult brain (Yun, 2022, p. 264; Zafonte, 2022, p. 445). A few years later, in 1898, E. Lugaro, an Italian psychiatrist and neurologist, connected the broader concept of neural plasticity to synaptic plasticity (1898).

Although Polish neurophysiologist J. Konorski is considered to be the first to formally define the term "neuroplasticity" in 1948, and elucidate how neurons can adapt and join active neural circuits (Konorski, 1948), earlier experimental evidence for this concept had already existed. Specifically, the first confirmation of this idea was provided by American psychologist and behaviorist K. Lashley in 1923 in his experiments with rhesus monkeys (1923), which resulted in changes in the brain circuits, and by Spanish neuroscientist J. Gonzalo in his studies in 1945 showing a reorganizable cortical "manoeuvring mass" (1945).

Despite the accumulated evidence, the skepticism regarding NP lingered until the 1970s, when a new generation of researchers provided convincing findings. For instance, American neuroscientist M. Diamond, who is regarded as the "mother of neuroplasticity", first demonstrated in 1971 and 1984 that an enriched, stimulating environment could promote brain growth regardless of age, while a deprived one could shrink it (1971; 1984).

Subsequently, the idea of NP was strengthened by American geneticist and neuroscientist F. Gage, who offered in 1995 important evidence for neurogenesis – the development of new neurons in the adult human brain (Gage et al., 1995; Eriksson et al., 1998; Gage, 2002; Shaffer, 2016, p. 2). Then, in 1998, American neuroscientist M. Merzenich and his colleagues conducted seminal experiments, which revealed that monkey brains could extensively reorganize after nerve damage. This work later led to the development of software to help individuals with learning difficulties (Buonomano, Merzenich, 1998; Kilgard, Merzenich, 1998).

Lastly, the "Decade of the Brain" (1990–2000) was a turning point that made NP a central research matter. In 1999, American researcher E. Taub (Taub et al., 1999) advanced therapies that "forced" damaged parts of the brain to rehabilitate faster in stroke patients and identified structural brain changes in skilled groups of people such as violinists and London cab drivers (Landon-Murray, Anderson, 2013, p. 74; Demarin et al., 2014, p. 209). The era culminated with American Nobel laureate E. Kandel, who provided in 2001 the molecular-level evidence for NP (Kandel, 2001). Kandel's research illustrated that learning modifies synaptic strength and long-term memory that requires synthesizing new proteins and growing new connections (Kandel, 2001, pp. 571, 573, 583). Finally, the modern era has provided cogent findings of the brain plasticity through neuroimaging technologies such as fMRI and DTI, which allow researchers to observe the brain's lifelong structural and functional adaptability in real time (Adebayo, 2024, p. 30; Xie, 2024, p. 1; Vovk, Shcherbukha, 2025, p. 137–138).

Interpretations and Scope of NP. Despite the pervasiveness of the term "neuroplasticity", it does not possess only one definable meaning. It has given rise to a debate relating to two major perspectives. The broader meaning of the term serves as a universal term for any change that occurs within the nervous system (Costandi, 2016). However, the narrower view integrates the meaning connected with the ability of nervous system to restructure its anatomy, functioning in response to experiences such as practice, learning, or environmental stimuli (Cramer et al., 2011; Mateos-Aparicio, Rodríguez-Moreno, 2019; Zafonte, 2022, p. 445; Yun, 2022, p. 264). According to that view, NP is a process that is triggered when the needs of the environment outweigh the current capabilities of the brain (Lövdén et al., 2010; Wenger, Kühn, 2021, p. 70) but does not embrace those that take place as part of purely genetically determined developmental paths (Axelrod et al., 2023, p. 288). Such a definitional complexity stemmed from NP involves an extremely large range of physiological processes from molecular signaling to structural changes (Garcés-Vieira, Suárez-Escudero, 2014; Souza et al., 2023, p. 668).

Types of NP. The term "neuroplasticity" is usually understood as an umbrella term that covers several types of brain changes (Abrahamsson, 2017, p. 3). Among them most prominent are structural and functional reorganizations (Staneiu, 2023, p. 1265), which are also categorized by their dependence on experience (Kolb, Gibb, 2014; Abrahamsson, 2017, p. 4; Vovk, Shcherbukha, 2025, p. 140–142).

In particular, structural plasticity includes physical alterations of the brain's anatomy (Butz et al., 2009; Abrahamsson, 2017, p. 4). It is vital for learning and memory, and is often induced by the developmental process or significant external stimuli (McEwen, Morrison, 2013; Luciana, Collins, 2022, p. 445; Lin, 2023, p. 224). This type is considered to occur slower than the functional type and can be observed with MRI or CT (Sagi et al., 2012; Abrahamsson, 2017, p. 4; Kumar, 2023, p. 2). Specifically, these changes include cellular processes such as neurogenesis (creation of new neurons) (Kays et al., 2012, p. 119), gliogenesis (creation of new glial cells) (Brodal, 2010; Wang et al., 2009), and angiogenesis (formation of new blood vessels) (Abrahamsson, 2017, p. 3); structural modifications to neurons like axonal sprouting, changes in dendritic branching and spine number (Albert, 2019, p. 147; Dan, 2019, p. 1240), and myelination (Guimarães et al., 2020, p. 2; Luciana, Collins, 2022, p. 445); molecular-level alterations, including changes in gene expression (McClung, Nestler, 2007; Yun, 2022, p. 268), and the release and sensitivity of neurotransmitters (Jasey, Ward, 2019, p. 336; Luciana, Collins, 2022, p. 450).

Synaptic plasticity is considered the central mechanism of NP. It is the process by which synapses become stronger or weaker depending on their level of activity (Adebayo, 2024; Lin, 2023). This mechanism is foundational for cognitive functions such as learning and memory, with Long-Term Potentiation and Long-Term Depression representing the major processes (Anderson et al., 2011; Lin, 2023; Xie, 2024).

Long-Term Potentiation is the extended strengthening of synaptic connections due to frequent activation, a process often summarized as "neurons that fire together, wire together" (Jasey, Ward, 2019, p. 335; Wenderoth, 2018). It is crucial for shaping memories as well as for learning in general (Lisman, 2017; Luciana, Collins, 2022, p. 446).

Long-Term Depression is a process that causes the prolonged weakening of inactive synaptic connections (Rum, 2023, p. 1). It significantly contributes to synaptic pruning, learning mediated by the hippocampus, and fear extinction based in the amygdala (Collingridge et al., 2010; Luciana, Collins, 2022, p. 446).

Besides, structural NP encompasses cellular changes, such as creation of supporting cells and changes to the structure of neurons. Gliogenesis, for instance, implies creation of new supporting glial cells to aid neurons, regulate blood supply, and preserve ion homeostasis (Brodal, 2010; Wang et al., 2009). They are highly plastic cells that can increase in quantity and size. They contribute to grey matter changes observed in MRI scans (Dong, Greenough, 2004; Wenger, Kühn, 2021, p. 74). Neurons also change physically through axonal sprouting, the growth of new nerve terminals to reconnect injured cells or create a different pathway. Simultaneously, dendrites can change their shape, branching, and spine number to modify connectivity of existing pathways (Albert, 2019, p. 147; Dan, 2019, p. 1240). These dendritic and axonal modifications are considered key drivers of experience-dependent plasticity (Holtmaat, Svoboda, 2009; Wenger, Kühn, 2021, p. 74).

Another key mechanism of structural NP is neurogenesis, creation of new neurons. In the adult brain, it occurs primarily in the hippocampus and the olfactory bulb. However, evidence suggests that neurogenesis can also occur in other brain regions (Baiyekusi, Prasad, 2016, p. 56; Gross, 2000; Hötting, Röder, 2013, p. 2248; Kays et al., 2012, p. 119; Ponti et al., 2008). Interestingly, the rate of neurogenesis can be increased by exercise and environmental enrichment, and decreased by chronic stress and depression (Maharjan et al., 2020, p. 2).

Aside from the aforementioned factors, particular prominence in structural NP is assigned to myelination – creation of a fatty myelin sheath around neurons, maximizing the efficiency of the neuron's signal which remains throughout adulthood (Guimarães et al., 2020, p. 2; Luciana, Collins, 2022, p. 445). Finally, angiogenesis, formation of new blood vessels from the existing vasculature to support the increased energy needs of the neural tissue (Abrahamsson, 2017, p. 3), is strongly induced throughout cerebral regions including the motor cortex (Kleim, Jones, 2008, p. 232; Kleim et al., 2002; Swain et al., 2003).

These structural and cellular changes are mediated through an array of molecules. For instance, proteins including Brain-Derived Neurotrophic Factor and Insulin-like Growth Factor 1 are fundamental mediators. To specify, Brain-Derived Neurotrophic Factor induces neuronal growth, synaptic plasticity, and survival (Cichon et al., 2020; Souza et al., 2023, p. 668), and Insulin-like Growth Factor 1 is essential for cell proliferation and for neurogenesis (Anderson et al., 2002). Physical training has been established to elevate the levels of both (Abrahamsson, 2017, p. 16).

Furthermore, there are alterations in the release and sensitivity of neurotransmitters – such as glutamate, dopamine, serotonin, noradrenaline, and acetylcholine, which are responsible for the onset and regulation of plasticity (Jasey, Ward, 2019, p. 336; Luciana, Collins, 2022, p. 450; Nall et al., 2021). In addition, lasting plasticity also relies on changes in gene expression to produce new proteins responsible for processes such as long-term potentiation and memory consolidation. This was proven when inhibitors of protein synthesis were shown to prevent long-term potentiation persistence (McClung, Nestler, 2007; Yun, 2022, p. 268).

In contrary, functional plasticity refers to changes that occur in the function of the brain, implying that they are not necessarily related to anatomical changes, such as alterations in synaptic strength, neuron excit?bility, or synchronicity of neural networks (Abrahamsson, 2017, p. 4; Dan, 2019, p.

1240). This type of plasticity is crucial for continuous adaptation to the environment, and it makes possible to transfer necessary functions from injured regions to healthy ones (Lindenberger, Lövdén, 2019; Luciana, Collins, 2022, p. 445; Lin, 2023, p. 224). Such shifts occur fast (within minutes to hours), and are considered more lasting than temporary processes, namely, action potentials or neurotransmitter release (Sagi et al., 2012; Abrahamsson, 2017, p. 4).

Conventionally, researches identify four major types of functional plasticity: 1) homologous area adaptation; 2) cross-modal reassignment; 3) map expansion; 4) compensatory masquerade (also known as alternative strategies) (Grafman, Litvan, 1999, p. 131; Vovk, Shcherbukha, 2025, p. 140–142).

Homologous area adaptation is most active during childhood development and involves a process where a cognitive function is assumed by its corresponding region in the opposite hemisphere of the brain. For example, after a significant stroke in the left hemisphere the patient's right hemisphere can compensate by taking over functions such as reading words (Grafman, Litvan, 1999, p. 134).

Cross-modal reassignment occurs when a brain region responsible for one sense is repurposed to process input from another. For instance, in blind individuals, the visual cortex becomes active when they read Braille (Sadato et al., 1996; Kleim, Jones, 2008, p. 227).

Map expansion is the process where a functional brain region grows in response to performance, learning, or frequent use of the corresponding body part or sensory input (Grafman, Litvan, 1999, pp. 132, 137). To instantiate, cortical maps representing fingers can expand in musicians (Grafman, Litvan, 1999, p. 137). Such an adaptation can be swiftly initiated (within minutes of activity) and solidified into a long-lasting change with regular practice (Grafman, Litvan, 1999, p. 135; Rosenzweig, Bennett, 1996; Vovk, Shcherbukha, 2025, p. 140–142).

Compensatory masquerade (also known as alternative strategies) presumes that the brain finds a new way to accomplish a certain task by either reallocating a cognitive process or using a different neural pathway (Grafman, Litvan, 1999, p. 131; Doidge, 2007; Yun, 2022, p. 265). This often happens after an injury, where an undamaged brain region takes over a function from a damaged one, which allows the individual to utilize existing neural pathways differently to achieve a certain goal (Doidge, 2007; Yun, 2022, p. 265).

Another way to classify NP is by its relation to experience (Kolb, Gibb, 2014; Abrahamsson, 2017, p. 5). Specifically, experience-expectant plasticity is most active during the developmental period and depends on particular experiences for neural systems to mature correctly. Notably, experiments have shown that if one eye of a newborn kitten or ferret is closed, the visual cortex area for the open eye will expand at the expense of the visual function of the closed eye later in life (Issa et al., 1999; Wiesel, Hubel, 1963; Abrahamsson, 2017, p. 5).

Experience-independent plasticity is interpreted as a developmental process where the brain first produces an excess of neurons and connections. Subsequently, neural pathways that are used become stronger, while unused connections and neurons are progressively pruned (Kolb, Gibb, 2014; Abrahamsson, 2017, p. 5). In contrast, experience-dependent plasticity typically involves modifications to existing neuronal networks and is not necessarily limited to development. It plays an essential role in understanding how the adult brain adjusts via learning and skill acquisition. Essentially, every experience – sensory input, learning a task, practice, exercise, diet, and stress – can provoke these changes (Kolb, Gibb, 2014; Abrahamsson, 2017, p. 6; Zafonte, 2022, p. 445).

Models of NP. Several models have been generated to outline the mechanisms of NP. In particular, Swedish professor at the Department of Psychology, University of Gothenburg, M. Lövdén and his colleagues (2010) proposed the Supply-Demand Model, claiming that NP is induced by a discrepancy between what the brain can do and what the environment requires it to do. In turn, a discrepancy of this kind may occur in two ways: first, if the requirements of a new challenge surpass the capacity of the brain, and second, if the capacity of the brain surpasses an unchallenging environment's demands (Abrahamsson, 2017, p. 8). An example of this process was provided by Bulgarian neuroscientist B. Draganski and his colleagues (2004), who studied people learning to juggle efficiently. At first, the environmental demand, particularly the ability to master the skill of juggling, was higher than the capacity of the brain, and the latter expanded its grey matter. But after stopping juggling for three months, the capacity of the participants' brains surpassed environmental demands, and the grey matter increase regressed to initial levels (Abrahamsson, 2017, p. 8–9).

Extrapolating this to SLA, the demand for acquiring new vocabulary, grammar, and phonetics, surpasses the functional ability of the brain, the latter reacts by increasing grey matter in language areas. However, once a student ceases to practice using the L2, the increased capacity of the brain surpasses environmental demands, and the grey matter increase may regress as L2 proficiency decreases.

The Expansion-Renormalization Model describes cortical plasticity as a two-stage process that aims to identify the most efficient minimal number of neurons for a given task (Reed et al., 2011). The initial stage is the Expansion of the cortical map wherein a surplus of neural circuits is developed within different areas of the brain to be utilized for stimuli relevant to the task (Abrahamsson, 2017, p. 10). This initial growth may involve an increase in tissue volume (activating more synapses and neurons) to support the metabolic needs (Makino et al., 2016; Wenger, Kühn, 2021, p. 77). Following this is the second step in which the most effective circuits are selected and strengthened while redundant ones are pruned (Reed et al., 2011). This refinement leaves fewer yet more specialized and stable neurons and synapses to represent information acquired (Makino et al., 2016; Wenger, Kühn, 2021, p. 77).

The expansion process and subsequent partial or complete renormalization, as in the case of pruning, were illustrated in motor learning experiments. It was observed that motor cortices' grey matter underwent expansion in the first few weeks of practice, followed by partial renormalization, although there was persistent practice and increasing competence (Wenger, Kühn, et al., 2017; Wenger, Kühn, 2021, p. 77). This reveals that the memory trace of a skill is maintained in the complex, rewired circuit of neurons and not in a bulk expansion of brain tissue volume (Holtmaat, Svoboda, 2009; Hofer, Bonhoeffer, 2010; Fu, Zuo, 2011; Wenger, Kühn, 2021, p. 77).

Factors Influencing NP. Numerous internal and external factors such as experience, environment, lifestyle, and age significantly affect NP. Commonly, the brain continuously rebuilds its neural circuits to encode new experiences and encourage behavioral changes (Black et al., 1997; Grossman et al., 2002; Kleim, Jones, 2008, p. 226). During learning, for instance, changes in the number and strength of synaptic connections enhance the brain's ability to store and retrieve information (Adebayo, 2024, p. 30). On the basis of the "use it or lose it" principle, experience reinforces the need for constant mental and physical activities to keep the brain healthy (Harasym, 2008, p. 339). Challenging tasks foster stronger neural connections, yielding efficient and durable longer-term learning (Maier, 2024, p. 1).

Furthermore, mastering a novel skill such as learning a new language or a musical instrument, causes measurable structural and functional alterations in the corresponding areas of the brain. For example, musicians show increased grey matter volume in motor, auditory, and visuospatial regions in relation to the intensity of practice (Yun, 2022, p. 264; Rodrigues et al., 2010, p. 278). Taxi drivers also develop a larger posterior hippocampus as they learn extensive navigational data (Maguire et al., 2000; Maguire et al., 2006; Wenger, Kühn, 2021, p. 72). A key component of learning is mental practice, as well as mental rehearsal, which alone can induce NP as it recruits the same brain regions as physical execution of the given task (Barclay-Goddard et al., 2011; Kays et al., 2012, p. 120; Kennedy, 2021, p. 4). Living in enriched or complex environments encourages NP by promoting social, physical, sensory, and cognitive stimulation (Kennedy, 2021, p. 5; McDonald et al., 2018).

In addition, physical exercise can generate structural and functional plasticity, improving neural function, increasing cortical volume, stopping volume loss due to aging, and improving cognition (Abrahamsson, 2017, p. 35). Besides, sufficient sleep is vital for NP, particularly for memory consolidation and reinforcement of synaptic changes. On the contrary, a lack of sleep can weaken the blood-brain barrier, trigger neuro-inflammation in the hippocampus resulting in learning deficits, and lower the levels of brain-derived neurotrophic factor necessary for the survival and growth of neurons (Zhu et al., 2012; Shaffer, 2016, p. 6).

Notably, NP is at its peak in childhood and adolescence but continues throughout the entire lifespan, though at a reduced rate (Johnston, 2004; Baiyekusi, Prasad, 2016, p. 56; Zafonte, 2022, p. 445). Normal aging typically involves some cognitive loss and neuronal shrinkage (Salat et al., 2004). However, the brain is still sensitive to experience. In fact, physical and mental exercise can help compensate for the age-related decline (Churchill et al., 2002; Kleim, Jones, 2008, p. 232) and may even reverse that reduction in neurogenesis (Vivar et al., 2013; Abrahamsson, 2017, p. 28).

Both structural and functional NP essentially impacts LA by inducing observable changes in the anatomy of the brain, such as increasing grey and white matter and cortical thickness, and by altering its patterns of neural activation to be more efficient, bilateral, and automatic (Vovk, Shcherbukha, 2025, p. 146–147).

Structural Brain Changes and LA. Recent findings of neuroscience have significantly enriched the field of LA by confirming that L2 learning is an effective stimulant of NP (Li et al., 2014; Mahmoud, 2024, p. 1; Poornalingam, 2025, p. 5665). Learning a language is a daily cognitive load that is healthy for anatomical and functional adaptations of the brain (Costa, Sebastián-Gallés, 2014; Witteman et al., 2018, p. 1; Isel, 2021, p. 56).

Contrary to the Critical Period Hypothesis, which constrains SLA to early childhood, the convincing evidence shows that the brain remains "plastic" and can sustain substantial L2 learning and neural reorganization well into adulthood (Lenneberg, 1967; Penfield, Roberts, 1959; Maher, 2013, p. 202; Keeley, 2016, pp. 62, 66; Isel, 2021, p. 56). However, learning in adulthood, the stage of life for most tertiary students, may differ from that in childhood (Watkins et al., 2017, p. 3; Witteman et al., 2018, p. 1). The idea of a neurologically-imposed barrier, based on an incomplete understanding of NP, is now considered false (Pascual-Leone et al., 2005, pp. 378–379; Shcherbukha, Vovk, 2023a, p. 1365; Shcherbukha, Vovk, 2023b, p. 26-27).

Neuroimaging techniques such as fMRI, PET, and DTI reveal that L2 learning induces structural and functional alterations that accompany SLA (Maher, 2013, p. 202; Mahmoud, 2024, p. 2). Beyond language processing, these adaptations transfer to basic cognitive processes and regularly are moderated by factors such as the age of acquisition and proficiency level (Bartolotti et al., 2016, p. 2; Rossi et al., 2017, p. 1), each of which is significant to considerations within University language curricula.

Furthermore, SLA induces significant observable structural changes within grey matter, white matter, and cortical thickness of the brain. Namely, SLA increases grey matter volume and density in pivotal brain regions (Bialystok, 2017, p. 234; Parikh, 2023, p. 61). In a number of studies, bilinguals report increased grey matter density within the left inferior parietal area, an important center of language processing, compared to their monolingual counterparts (Mechelli et al., 2004; Bartolotti et al., 2016, p. 1; Bialystok, 2017, p. 234; Poornalingam, 2025, p. 5666). The extent of this structural alteration is moderated by L2 proficiency and age of learning, as high proficiency and early acquisition are linked to greater grey matter density (Mechelli et al., 2004; Rossi et al., 2017, p. 2; Mercado, 2018, pp. 5–6; Heidlmayr et al., 2021, p. 107839; Shcherbukha, 2025, p. 220).

As a fundamental language area, the inferior frontal gyrus demonstrates increased activation in bilinguals (Pascual-Leone et al., 2005; Mahmoud, 2024, p. 2) and increased grey matter volume from intensive language training (Mårtensson et al., 2012; Hosoda et al., 2013; Bartolotti et al., 2016, p. 2). For instance, it can be pronounced in University students undergoing an intensive, semester-long interpreter training program. Yet, some longitudinal studies identify grey matter volume reductions in the right inferior frontal gyrus after a year of learning, which can indicate more efficient and automatized language control processing (Liu, 2021, pp. 1, 2, 7).

Essential for executive processes such as conflict monitoring, the Anterior Cingulate Cortex exhibits higher grey matter volume in bilinguals (Abutalebi et al., 2012; Li et al., 2014, p. 304; Chung-Fat-Yim, 2023, p. 10; Poornalingam, 2025, p. 5665). On the other hand, grey matter volume reduction has been reported in the left anterior cingulate cortex following one year of L2 learning, a reduction that is associated with better behavioral performance on language control tasks. This is interpreted as a move towards more efficient processing, as the dependence on frontal cortical areas reduces (Liu, 2021, pp. 1, 2, 7). Increases in grey matter volume have been observed in other areas including the superior temporal gyrus, middle frontal gyrus, anterior temporal lobe, hippocampus, and caudate nucleus, areas that take part in language processing, vocabulary acquisition, memory, and control (Mårtensson et al., 2012; Isel, 2021, p. 72; van Hell, 2023, p. 24; Shcherbukha, 2025, p. 220).

SLA is also known to alter the white matter tracts, which are bundles of myelinated axons that link brain regions and facilitate intercommunication of neurons (Cruz, 2017, p. 7). Detected by metrics such as fractional anisotropy, these changes imply the strengthening of already present connections or the generation of new ones that lead to the improvement of neural efficiency (Bubbico et al., 2023, p. 9; Chung-Fat-Yim, 2023, p. 9). Fractional anisotropy increase and diffusivity were found to be significant within tracts including the inferior fronto-occipital fasciculus, superior longitudinal fasciculus, anterior thalamic radiation, and arcuate fasciculus (Rossi et al., 2017, p. 1; Bubbico et al., 2023, p. 2; Wei et al., 2024, p. 2).

Short-term language learning by older adults is associated with increased axial and mean diffusivity in tracts that map onto superior executive functions (Bubbico et al., 2023, pp. 2, 12). The corpus callosum, located between the left and right hemis-?heres, is also prone to complex changes. Whereas some studies report increased connectivity (Bubbico et al., 2023, p. 2), others have observed decreased inter-hemispheric connectivity. Such a decrease might lower the inhibitory effect of the dominant left hemisphere over the right hemisphere to unlock the resources of the right hemisphere that can contribute to learning new L2 features (Wei et al., 2024, pp. 6–7).

Acquiring a L2 can also lead to cortical thickness changes, preventing thinning normally associated with aging (Watkins et al., 2017, p. 3). Extensive language training increased cortical thickness within regions engaged by language, including the left inferior frontal gyrus, middle frontal gyrus, superior temporal gyrus, and the right hippocampus (Mårtensson et al., 2012; Isel, 2021, p. 68; van Hell, 2023, p. 24).

Functional Brain Changes and LA. SLA is correlated with changed patterns of neural activation. Although language processing is primarily left- hemispheric, particularly in monolinguals, in the Broca and Wernicke areas (Edjidjimo-Madua, 2022, p. 4; Nouadri, 2024, p. 158), multilinguals tend to recruit a larger, more dispersed set of neural resources with intensified involvement of both hemispheres (Wang et al., 2020, p. 7; Nouadri, 2024, p. 158).

The right hemisphere is particularly active, especially during preliminary and less competent stages of L2 proficiency, whereby novel intonation, lexical-semantic infor-?ation, and novel sounds are processed (Edjidjimo-Madua, 2022, p. 41; Wei et al., 2024, pp. 2, 5). The bilateral involvement signifies that the system reacts to the requirenments of processing multiple languages through the enlisting of additional neural resources (Nouadri, 2024, p. 158; Wei et al., 2024, p. 1).

Prolonged L2 use promotes greater neural efficiency, which is possible through streng-thened connections, faster processing, and more focal or synchronized activation of neurons (Turker et al., 2021, p. 399; Chung-Fat-Yim, 2023, p. 9; van Hell, 2023, p. 23). This efficiency is achieved through a shift in brain activity from heavy recruitment of frontal cortical regions that contribute to effortful cognitive control in frontal areas (such as the anterior cingulate cortex and inferior frontal gyrus) to more automatic processing in subcortical and posterior regions (such as the basal ganglia and cerebellum) (DeLuca, 2020, pp. 5, 9; Liu, 2021, p. 2). This shift, described by models such as the Bilingual Anterior to Posterior and Subcortical Shift (BAPSS), results in efficient and automatic control of language (DeLuca, 2020, p. 9; Liu, 2021, p. 2). Furthermore, this greater efficiency may construct neural reserve and yield better cognitive outcomes after brain damage, such as stroke (Alladi et al., 2016; Paplikar et al., 2019; Pliatsikas et al., 2020, p. 141).

Among the principal regions of the brain, the following particularly show functional changes during SLA: the hippocampus, basal ganglia, the Wernicke and Broca areas, and the fusiform gyrus. In particular, the hippocampus is central to memory and the formation of new lexical-semantic connec-tions, and it is highly active in the initial stages of vocabulary learning (Mårtensson et al., 2012; Bartolotti et al., 2016, p. 2; Ware et al., 2021, p. 9). As this knowledge solidifies and is transferred to the neocortex, the hippocampal activation declines (Davis, Gaskell, 2009; Bartolotti et al., 2016, p. 6). Also, an individual's initial hippocampal volume can even predict their success in learning new vocabulary (Klimova, Silva, 2024, p. 3).

The subcortical areas known as basal ganglia, including caudate and putamen, play a key role in the procedural aspects of LA, such as sequential learning and grammar (Ullman, 2004; Turker et al., 2021, pp. 398–399). They are also central to language control, including the management of speech articulation and switching between languages (Rossi et al., 2017, p. 2). Structural and functional alterations in these areas are evident when learners reach a consolidation stage, which signals a shift towards more automatized language processing (Pliatsikas et al., 2020, p. 136).

Lastly, the brain's language regions, the Broca and Wernicke areas, also get adapted to the process of handling multiple languages. They are not fixed but rather become part of a larger, bilateral network in multilinguals to process multiple languages (Nouadri, 2024, pp. 158, 159). Another example is the fusiform gyrus, a region for orthographic processing, which also shows neuroplastic characteristics. This is seen in native Chinese-speaking individuals learning English, becoming more reliant on the right fusiform gyrus, presumably due to the logographic nature of their first language (Wang et al., 2020, pp. 7, 9).

Factors Affecting NP in SLA. The neuroplastic changes related to SLA are controlled by a set of interacting factors (Isel, 2021, p. 62; Liu, 2021, p. 7), such as age of acquisition, proficiency level, intensity and diversity of language use/exposure, learning context and methodology, individual differences and aptitude, and L1-L2 typological distance and interaction.

Particularly, the age of LA greatly determines how the brain responds to language mastering, despite brain plasticity remaining lifelong (van Hell, 2023, p. 3). For instance, language learners acquire native-like proficiency with more efficient, optimized neural networks (Mechelli et al., 2004; Poornalingam, 2025, p. 5666). Late learners, on the other hand, often engage more extensive neural resources, indicating greater activation of language and executive control areas, presumably a compensatory mechanism for an already consolidated L1 system (Berken, 2017, p. 223; Maher, 2013, p. 203; van Hell, 2023, p. 20).

Advanced L2 proficiency is systematically linked to specific neuroplastic changes (Keeley, 2016, p. 68). High-level proficiency is usually linked to higher grey matter density of critical language areas such as the left inferior parietal lobule (Mechelli et al., 2004; Bialystok, 2017, p. 234; Rossi et al., 2017, p. 2). Functionally, activation patterns are, as proficiency reaches its adult form, more economical and automatic, at times native-like and activating less diffuse activation across control areas (Perani et al., 1998; Keeley, 2016, p. 68; van Hell, 2023, p. 18).

The continuous cognitive load of managing multiple languages directly impacts brain function and structure (Bialystok, 2017, p. 234; Chung-Fat-Yim, 2023, p. 10). The extent of such reorganisation depends on the volume of linguistic input, which includes frequency, intensity, and variety of exposure (Witteman et al., 2018, p. 1; Isel, 2021, pp. 55–56). A substantial effect is evident in military interpreter or study abroad programs that showed profound structural changes in learners' brains within several months (Mårtensson et al., 2012; Bartolotti et al., 2016, p. 2; Wei et al., 2024, p. 1).

In addition, brain adaptations are significantly driven by the context and methods of learning. For example, multimodal teaching that activates the auditory, visual, and kinesthetic senses is extremely effective because it recruits both hemispheres of the brain (Edjidjimo-Madua, 2022, p. 41; Nshimiyimana, 2024, p. 1017). Similarly, learning through social interaction has a greater impact on the brain than through media (Yusa et al., 2017; Ware et al., 2021, p. 10). In the University context, the learning environment that induces motivation, positive emotions, and attention with the execution of pedagogical techniques such as spaced repetition and metacognition can maximize learning outcomes by harmoniously adhering to neurocognitive rules (Edjidjimo-Madua, 2022, p. 50; Mahmoud, 2024, pp. 1–2). Also, computer-based training programs that target basic cognitive abilities can effectively enhance language skills through NP (Rogowsky, 2013, pp. 1, 3; Vovk, Shcherbukha, 2025, p. 153–154).

Apart from those mentioned above, pre-existing individual factors can strongly affect NP. Individuals with superior language aptitude, greater working memory capacity, or advantageous neuroanatomical characteristics may reach higher learning accomplishments (Witteman et al., 2018, p. 2; Turker et al., 2021, pp. 391–392). Although learning induces NP in everyone, this process can be faster and more efficient in individuals with a greater innate aptitude (Seither-Preisler et al., 2014).

Also, the linguistic distance between the learner's L1 and the L2 can shape the neural changes (Li et al., 2014, p. 319). For instance, because of the logographic features of the learner's L1, Chinese native speakers learning an alphabetic language, such as English, might exhibit higher activation of visual processing areas, such as the fusiform gyrus, than native speakers of alphabetic languages (Wang et al., 2020, p. 9).

Implications of NP and Language Instruction. There are some implications for language students and instructors derived from the research findings on NP. One of the primary insights for learners is that the continuous plasticity of the brain allows for successful SLA at any age (Maher, 2013, p. 203; Edjidjimo-Madua, 2022, p. 41). It is especially important for adult learners who enter language-related programs at the University. Such a perspective eliminates the "critical period window" that abruptly shuts. Instead, it introduces the "sensitive period", after which acquisition is possible, though it is not as effective as in childhood (Keeley, 2016, pp. 65–66; Shcherbukha, Vovk, 2025, p. 360). Although there is a difference between the mechanisms and outcomes of child and adult LA, the potential for significant neurological and behavioral changes still persists (Watkins et al., 2017, p. 3).

Moreover, SLA at the tertiary level is an intellectually demanding task that improves a range of cognitive abilities (Witteman et al., 2018, p. 1). Particularly, the need to control and switch between languages strengthens executive functions such as inhibitory regulation, attentional switching, and cognitive flexibility (Liu, 2021, p. 2). Such a benefit extends to the improvement of working memory, problem solving abilities, and attention regulation (van Hell, 2023, p. 25; Poornalingam, 2025, p. 5665).

Additionally, increasing evidence indicates that bilingualism builds "cognitive reserve" that can postpone age-related cognitive decline and neurodegenerative diseases such as dementia (Ware et al., 2021, p. 1). In older adults, SLA even in the short term can initiate beneficial structural reorganizations of the brain linked to better executive functions that indicate the potential efficacy as an affordable, non-pharmacological tool to support the brain health in the aging population (Bubbico et al., 2023, p. 12).

Taking into account the abovementioned, language instructors in higher education can maximize SLA by understanding how the brain works (Edjidjimo-Madua, 2022, p. 35). It involves creating a positive, interactive and well-being-focused learning environment, and adapting lessons to the adult learners' particular neurocognitive growth (Edjidjimo-Madua, 2022, pp. 43, 49).

Since SLA involves both brain hemisphere, language instruction is intended to follow a holistic and multimodal approach (Edjidjimo-Madua, 2022, pp. 41, 50). This implies incorporating multisensory activities (auditory, visual, kinesthetic) through various methods and techniques such as stories, games, music, motion, mind-maps, and technology (Edjidjimo-Madua, 2022, p. 50; Nshimiyimana, 2024, p. 1017).

Further, best practices in active teaching employ critical cognitive systems in the process of learning to foster better engagement (Nshimiyimana, 2024, p. 1016). First, language instructors are expected to foster motivation and positive emotions through engaging and rewarding experiences (Edjidjimo-Madua, 2022, p. 50). Second, it is critical to focus on learners' stronger declarative memory and offer activities to develop their procedural memory over time (Edjidjimo-Madua, 2022, pp. 36, 50). Lastly, it is pivotal to encourage a growth mindset by giving immediate constructive feedback and rewarding students' efforts rather than innate ability, which is crucial for motivation and perseverance (Edjidjimo-Madua, 2022, pp. 40, 50; Gold, 2023, p. 61).

For good measure, tertiary language instructors are supposed to be aware that frequent, active exposure to the targeted language is desired for developing fluency (Maher, 2013, p. 205; Nation, Newton, 2009). Intensive language practice reinforces synaptic connections, making neural circuits more effective, and facilitates the movement of newly acquired language from short-term memory to long-term memory (Maher, 2013, pp. 203, 206). Interactive activities such as role-playing, debating, and storytelling are more effective than passive activities in advancing speaking skills (Nshimiyimana, 2024, p. 1022).

Given that the presented material is rather complex it deems relevant to streamline and symbolize it in the form of a conceptual model, which might significantly simplify its comprehension (fig. 1).

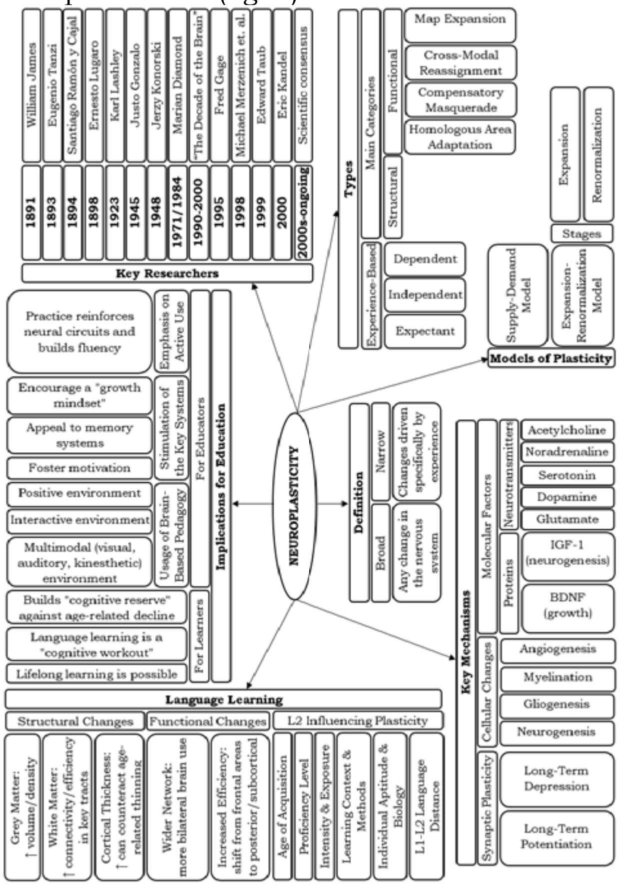

Fig. 1. Neuroplasticity and Second Language Acquisition

Future Directions. Despite considerable progress, a significant gap remains between sophisticated neuroscience research and its regular application in tertiary L2 classrooms. Future research needs to bridge this gap by undertaking investigations specifically on SLA (and not just general learning) and ensuring that the findings are translated into specific, evidence-based pedagogical approaches that are tested in actual University teaching environments with input from both teachers and students.

Besides, a deeper understanding of how the learning process interacts with the pre-existing individual differences in language aptitude, motivation and cognitive control capacities is imperative. Investigations into aspects such as the brain functional connectivity may predict learning success or failure, allowing teachers to customize and develop more effective pedagogical strategies.

In conclusion, the phenomenon of NP proves that the human brain is malleable and flexible, rather than a rigid entity. The brain is constantly reorganizing itself based on various experiences including the linguistic one. It offers substantial cognitive advantages throughout one's lifespan and provides a scientific basis for improving the future of L2 Pedagogy in higher education.

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ОПАНУВАННЯ ДРУГОЇ МОВИ У ВИЩІЙ ОСВІТІ: РОЛЬ НЕЙРОПЛАСТИЧНОСТІ

Анотація. *У статті досліджуються суттєві структурні та функціональні зміни в мозку, зумовлені опануванням другої мови (ДМ) на ґрунті нейропластичності.*

Метою статті є комплексне вивчення феномену нейропластичності та з'ясування, які структурні та функціональні зміни в мозку спричиняє засвоєння нової мови.

Методи. У дослідженні застосовано метод теоретичного аналізу наукових джерел із заявленої теми. Він поєднує фундаментальні принципи нейропластичності, її історію, визначення, типи та механізми, і системно застосовує цю концептуальну структуру для аналізу структурних і функціональних змін у мозку, що відбуваються під час засвоєння ДМ.

Результати. У статті обґрунтовано, що мозок залишається пластичним упродовж усього життя, всупереч класичній гіпотезі критичного періоду. Засвоєння ДМ спричиняє глибокі вимірювані нейропластичні зміни. На структурному рівні це включає збільшення щільності сірої речовини в ключових мовних зонах (нижній тім'яній частці та нижній лобовій звивині), поліпшення цілісності білої речовини у важливих трактах (дугоподібному пучку) та збільшення товщини кори головного мозку. На функціональному рівні засвоєння ДМ пов'язане з формуванням більш білатеральної нейронної мережі, тенденцією до вищої нейронної ефективності (переходом від затратного лобового до автоматичного підкоркового оброблення інформації), а також залученням таких ділянок, як гіпокамп та базальні ганглії. Ці зміни детермінуються віком засвоєння певною мірою, рівнем володіння мовою та інтенсивністю навчання.

Наукова новизна результатів дослідження полягає в синтетичному узагальненні досліджень нейропластичності та їх систематичному застосуванні до вивчення процесу засвоєння ДМ. Завдяки структуруванню інформації за допомогою чітких визначень, таксономій та моделей, у статті розроблено цілісну концептуальну структуру, яка долає розрив між фундаментальною нейронаукою та прикладною лінгводидактикою, пропонуючи інтегроване джерело знань як для науковців, так і для викладачів-практиків.

Висновки. Оволодіння ДМ є потужним стимулом для нейропластичності, що докорінно змінює структуру та функції мозку в будь-якому віці. Цей процес не лише вможливлює опанування мови, а й зміцнює загальні когнітивні здатності та створює когнітивний резерв, що запобігає віковому когнітивному регресу. Здатність мозку до змін упродовж життя підтверджує можливість успішного засвоєння мови в дорослому віці та підкреслює актуальність педагогічних практик, ґрунтованих на знаннях про роботу мозку.

Перспективи подальших досліджень. Майбутні дослідження передбачають необхідність подолання розриву між нейронауковими дослідженнями та педагогічною практикою шляхом проведення цільових дидактичних розвідок. Майбутні розвідки також мають бути спрямовані на вивчення взаємозв'язку між нейропластичністю та індивідуальними відмінностями у здатностях, мотивації та когнітивних профілях студентів із метою розроблення більш індивідуалізованих ефективних стратегій навчання мови.

Ключові слова: *нейропластичність; засвоєння другої мови; білінгвізм; сіра речовина; біла речовина; структурна та функціональна пластичність мозку; когнітивний резерв; вік початку засвоєння; лінгводидактика.*

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СТАН ІНТЕГРОВАНОГО НАВЧАННЯ ПРОФЕСІЙНО-СПРЯМОВАНОЇ АНГЛІЙСЬКОЇ МОВИ МАЙБУТНІХ СОЦІАЛЬНИХ ПРАЦІВНИКІВ У СУЧАСНИХ ЗАКЛАДАХ ВИЩОЇ ОСВІТИ

У науковому дослідженні здійснено комплексний аналіз поточного стану інтегрованого навчання професійно-спрямованої англійської мови для майбутніх соціальних працівників у сучасних ЗВО.

З'ясовано, що розвиток здатності до іншомовного фахового спілкування є критично важливою складовою підготовки, оскільки ефективність соціальної роботи в умовах глобалізації залежить від комунікативної підготовленості.

Встановлено, що інтегроване професійно-спрямоване навчання є ключовою умовою підвищення якості фахової підготовки та конкурентоздатності майбутніх соціальних працівників на ринку праці.

З метою виявлення рівня англомовної підготовленості було проведено анкетування 120 здобувачів (бакалаврський рівень, спеціальність 231 «Соціальна робота») у трьох провідних закладах вищої освіти. Узагальнено результати, які засвідчили необхідність модернізації навчально-методичного забезпечення та посилення мотивації здобувачів. Виокремлено низку проблем: недостатня кількість годин, невідповідність змісту робочої програми очікуванням здобувачів та відсутність чіткої методики навчання професійно-спрямованої англійської мови.

Підсумовано, що зміст програм не відповідає вимогам ринку праці. Проаналізовано зміст чинних навчальних посібників з англійської мови для майбутніх соціальних працівників

Рекомендовано подальші наукові розвідки сфокусувати на детальному аналізі програмного забезпечення для розробки та впровадження ефективної системи вправ і інноваційних методик, які підвищать рівень професійно-спрямованої англомовної підготовленості.

Ключові слова: *інтегроване навчання, англійська мова за професійним спрямуванням, соціальний працівник, професійно-спрямована англомовна підготовленість.*

Постановка проблеми. Формування здатності до англомовного професійного спілкування є невід'ємною складовою професійної підготовки фахівця, забезпечуючи ефективну міжкультурну взаємодію в умовах глобалізованого суспільства. В контексті соціальної роботи англійська мова є інструментом, успіх використання якого залежить від професійно-спрямованої англомовної підготовленості. Це зумовлює нагальну потребу у науково обґрунтованій системі інтегрованого професійно-спрямованого навчання англійської мови для майбутніх соціальних працівників у ЗВО, що є головною передумовою підвищення якості їхньої фахової підготовки та конкурентоспроможності на ринку праці.

Мета статті. Дослідити й схарактеризувати сучасний стан організації інтегрованого навчання англійської мови за професійним спрямуванням для майбутніх соціальних працівників у ЗВО.

Огляд результатів, дотичних до теми статті. Проблема якісної іншомовної професійної підготовки фахівців соціальної сфери є надзвичайно актуальною. В умовах глобалізації розвиток здатності до ефективного іншомовного спілкування стає необхідним елементом фахової компетентності (Ткачов та ін., 2025, с. 14). Дослідники визначають іншомовну професійну під-