# GENERAL SECONDARY EDUCATION
# ЗАГАЛЬНА СЕРЕДНЯ ОСВІТА

## ADDRESSING COGNITIVE PROCESSES AND BIASES IN TEACHING ENGLISH AS A SECOND LANGUAGE TO YOUNG LEARNERS

### K. V. Harashchuk*

*The acquisition of English as a second language (ESL) by young learners is a cognitively complex process influenced by developmental factors and shaped by systematic cognitive biases. While traditional ESL teaching approaches emphasize input comprehensibility and communicative interaction, they often overlook how cognitive distortions, such as confirmation bias, anchoring bias, cognitive dissonance and stereotyping affect the perception, processing, and internalization of linguistic material. These biases can lead to persistent errors, hinder corrective feedback effectiveness, and limit learners' linguistic flexibility.*

*This article examines the intersection of cognitive development theories and cognitive bias research within the context of ESL education for young children. Drawing on foundational works by Piaget, Vygotsky, and Krashen, as well as recent empirical studies, the study analyzes how cognitive biases manifest in early language learning and reviews practical strategies for their mitigation. The particular attention is given to scaffolding, gamification, storytelling, metacognitive strategies, and differentiated instruction as tools for fostering cognitive flexibility and accurate language acquisition.*

*The article highlights current research gaps, including the lack of targeted bias-mitigation strategies in ESL curricula and limited longitudinal studies on this topic. It proposes a structured, bias-aware approach to ESL teaching for young learners, aiming to align instructional methods with cognitive realities and promote sustainable language development. The findings have direct implications for educators, curriculum designers, and researchers seeking to enhance the effectiveness of ESL instruction through cognitively informed practices.*

***Keywords:*** *cognitive biases, young learners, ESL teaching strategies, second language acquisition, scaffolding in ESL, gamification in language learning, metacognitive strategies.*

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# УРАХУВАННЯ КОГНІТИВНИХ ПРОЦЕСІВ І УПЕРЕДЖЕНЬ У ВИКЛАДАННІ АНГЛІЙСЬКОЇ МОВИ ЯК ДРУГОЇ УЧНЯМ МОЛОДШОГО ВІКУ

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*Оволодіння англійською мовою як другою для дітей молодшого віку є складним когнітивним процесом, який залежить від особливостей розвитку та формується під впливом системних когнітивних упереджень. Традиційні підходи до викладання англійської як другої мови (ESL) зосереджуються переважно на забезпеченні доступного мовного середовища та комунікативній взаємодії, проте часто ігнорують вплив когнітивних викривлень, таких як упередження підтвердження, ефект якоря, когнітивний дисонанс і стереотипізація, на сприйняття, обробку та засвоєння мовного матеріалу. Ці упередження можуть призводити до закріплення помилок, знижувати ефективність корекційного зворотного зв'язку та обмежувати когнітивну гнучкість учнів.*

*У статті проаналізовано взаємозв'язок теорій когнітивного розвитку та досліджень когнітивних упереджень у контексті навчання дітей англійської мови як другої. Спираючись на праці Ж. Піаже, Л. Виготського, С. Крашена, а також сучасні емпіричні дослідження, розглянуто прояви когнітивних упереджень у процесі засвоєння мови та проаналізовано практичні стратегії їх подолання. Особливу увагу приділено застосуванню скаффолдингу, гейміфікації, сторітелінгу, метакогнітивних стратегій і диференційованого навчання для розвитку когнітивної гнучкості та ефективного засвоєння мовного матеріалу.*

*Визначено наявні прогалини в дослідженнях, зокрема відсутність цілеспрямованих стратегій подолання когнітивних упереджень у програмах ESL та нестачу довгострокових досліджень у цій сфері. Запропоновано структурований, орієнтований на когнітивні особливості підхід до викладання англійської як другої мови дітям молодшого віку, що має на меті підвищення ефективності навчання за рахунок врахування когнітивних процесів учнів. Отримані результати мають безпосереднє значення для викладачів, розробників навчальних програм та дослідників, які прагнуть підвищити ефективність викладання англійської як другої мови за допомогою когнітивно обґрунтованих практик.*

***Ключові слова:*** *когнітивні упередження, молодші школярі, стратегії викладання ESL, засвоєння другої мови, скаффолдинг у навчанні англійської як другої мови, гейміфікація в мовному навчанні, метакогнітивні стратегії.*

**Introduction of the issue.** The process of acquiring a second language in early childhood has long been recognized as a complex and multifaceted phenomenon. Unlike adults, young learners approach language acquisition through cognitive mechanisms that are still in the process of development, making their learning pathways fundamentally different. Traditional methods of ESL (English as a Second Language) instruction, often designed with adult learners in mind, fail to fully account for the specific cognitive, emotional, and developmental characteristics of children.

One of the most significant yet frequently overlooked challenges in teaching English to young learners lies in the influence of cognitive biases. These biases, such as confirmation bias, anchoring bias, cognitive dissonance, and stereotyping, affect how children perceive, process, and internalize new linguistic information. Operating largely at a subconscious level, these biases can reinforce incorrect language patterns, hinder error correction, and limit learners' openness to linguistic diversity. As a result, despite increased exposure and practice, certain errors and misconceptions persist, leading to fossilized language habits that are difficult to correct at later stages.

At the same time, the emotional and motivational aspects of young learners' cognition play a crucial role in their language acquisition journey. Positive learning experiences, characterized by engagement, curiosity, and a sense of achievement, can enhance cognitive flexibility and facilitate the adoption of new linguistic structures. Conversely, negative emotions such as anxiety, fear of

*Zhytomyr Ivan Franko State University Journal. Pedagogical Sciences. Vol. 2 (121)*

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failure, or frustration can exacerbate cognitive biases, leading to avoidance behaviors and reduced learning outcomes.

In recent years, the growing body of research in cognitive psychology and educational neuroscience has provided valuable insights into how these cognitive processes and biases operate in learning contexts. However, the practical implications of these findings for ESL teaching methods remain underexplored, particularly in the context of early childhood education. There is a clear gap between theoretical knowledge about cognitive biases and its application in everyday classroom practices.

Given the increasing emphasis on early English language education worldwide, it becomes imperative to develop teaching strategies that are not only linguistically sound but also cognitively aware. Addressing the influence of cognitive biases in young learners is not a peripheral concern but a central pedagogical challenge that directly impacts the effectiveness of ESL instruction.

This article seeks to bridge this gap by examining how cognitive processes and biases affect ESL learning in young children and by proposing evidence-based strategies for mitigating these biases in the classroom. By doing so, it aims to contribute to the development of more effective, bias-aware teaching practices that align with the cognitive realities of young ESL learners.

**Current state of the issue.** The study of second language acquisition (SLA) in young learners has traditionally focused on developmental and sociocultural factors. Foundational theories by Piaget [16] and Vygotsky [19] established that children's cognitive abilities and social interaction are critical in language learning. Piaget emphasized the role of concrete thinking and developmental stages, while Vygotsky's concept of the Zone of Proximal Development (ZPD) highlighted scaffolding and collaborative learning as essential for language development.

Further refinements came from Krashen's Input Hypothesis, underscoring the necessity of comprehensible input slightly beyond the learner's current competence (i+1). Modern approaches, as noted by Ye [21], integrate these principles with interactive and technology-enhanced teaching methods to foster meaningful language use in young learners.

However, a relatively underexplored dimension in ESL education is the impact of cognitive biases on young learners' language acquisition. Recent research has shown that biases such as confirmation bias, anchoring bias, and cognitive dissonance affect how children perceive, process, and internalize new linguistic material. Gibson et al. [8] analyzed how confirmation bias reinforces incorrect language patterns despite corrective feedback. Similarly, Gordo et al. [9] highlighted anchoring bias in pronunciation learning, where initial errors persist even after repeated exposure to correct forms.

In response, practical teaching strategies like gamification [22], storytelling [7], and scaffolding [18] have been employed to enhance engagement and mitigate learning challenges. Wang [20] emphasized the importance of teacher immediacy and metacognitive strategies to support learners' self-regulation. These interventions indirectly address cognitive biases by promoting flexible thinking and contextualized learning.

Nevertheless, while these methods are effective, they are often applied without a specific focus on bias mitigation. The connection between cognitive biases and ESL teaching strategies remains fragmented, with few studies systematically exploring how to adapt teaching practices to counteract these biases in young learners.

**Outline of unresolved issues brought up in the article.** Despite existing research on cognitive development and effective ESL teaching methods, several important questions remain unresolved. The role of cognitive biases in shaping language acquisition outcomes for young

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learners is acknowledged in theory but insufficiently addressed in practice. There is a lack of systematic studies examining how specific biases, such as confirmation bias or anchoring bias, directly influence ESL learning processes.

Most current interventions, including gamification, storytelling, and scaffolding, are implemented as general engagement strategies rather than targeted solutions for bias mitigation. As a result, their potential to address cognitive distortions in language processing is not fully realized or evaluated.

Additionally, cognitive bias considerations are largely absent from curriculum design and assessment practices in ESL education. Research often focuses on short-term interventions, lacking longitudinal studies that could reveal the sustained impact of bias-aware teaching strategies.

Another gap lies in the limited exploration of how emotional and motivational factors interact with cognitive biases in ESL contexts. The interplay between affective states and biased processing remains an under-researched area, despite its evident influence on young learners' language development.

Thus, there is a pressing need for research that bridges cognitive psychology and applied linguistics, focusing on practical strategies for identifying and mitigating cognitive biases in ESL education. This article seeks to contribute to filling this gap by synthesizing existing knowledge and proposing a structured, bias-aware approach to teaching English to young learners.

**Aim of the research.** The aim of this article is to analyze how cognitive processes and biases influence the acquisition of English as a second language among young learners and to propose practical teaching strategies for mitigating these biases in classroom settings. By synthesizing existing theoretical frameworks and empirical research, the study seeks to identify effective methods, such as scaffolding, gamification, storytelling, and

metacognitive strategies, that can address common cognitive distortions, including confirmation bias, anchoring bias, and cognitive dissonance.

Furthermore, the article aims to bridge the gap between cognitive psychology insights and applied ESL pedagogy by outlining a structured, bias-aware approach to language instruction. The ultimate objective is to enhance the effectiveness of ESL teaching for young learners by aligning pedagogical practices with their cognitive development and processing tendencies, thereby fostering more accurate, flexible, and sustainable language acquisition.

**Results and discussion.** The acquisition of a second language (L2) by young learners is a highly complex cognitive process, influenced by the developmental stage of the child, their socio-cultural context, and the educational methodologies employed. Cognitive development theories, notably those by Piaget [16] and Vygotsky [19], provide essential frameworks for understanding the unique characteristics of young learners in the context of L2 acquisition.

Jean Piaget's theory emphasizes that children progress through distinct cognitive stages. The preoperational stage (2-7 years) is characterized by symbolic thinking but limited logical reasoning, while the concrete operational stage (7-11 years) introduces logical operations tied to tangible experiences. Abstract linguistic concepts such as tense, mood, and syntactic hierarchy remain cognitively demanding at these stages. Therefore, teaching methods that prioritize concrete, context-embedded experiences, such as storytelling, role-play, and visual supports, align more effectively with children's cognitive readiness [18].

Lev Vygotsky's sociocultural theory complements Piaget's views by emphasizing the social nature of learning. His concept of the Zone of Proximal Development (ZPD) posits that children achieve higher levels of cognitive and linguistic competence through guided interaction with more knowledgeable

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peers or adults. ESL instruction that incorporates scaffolding – structured support that is gradually withdrawn as competence increases – leverages this principle. Collaborative learning activities, teacher modeling, and peer-assisted tasks are essential strategies that operationalize Vygotsky's theory in the ESL classroom [7].

An essential cognitive limitation of young learners is their underdeveloped working memory. Research indicates that children can simultaneously process and retain a limited number of informational chunks, often fewer than adults [3]. This constraint necessitates the design of instructional tasks that avoid cognitive overload. Teachers must prioritize simplicity, redundancy, and multimodality in lesson planning to facilitate retention and comprehension. Visual aids, gestures, and manipulatives serve as cognitive supports that extend children's processing capacity, as demonstrated in multimedia storytelling interventions.

Another dimension of cognitive processing in young learners pertains to implicit and explicit learning mechanisms. Young children excel in implicit learning – acquiring language through exposure and interaction without conscious analysis. Explicit instruction of metalinguistic rules often proves less effective at early developmental stages. This underscores the importance of immersive, communicative approaches in ESL instruction, where language is learned through meaningful use rather than decontextualized drills [21].

Motivation and emotion significantly modulate cognitive engagement. Positive affective states – curiosity, enjoyment, and a sense of belonging – enhance attention and memory. Conversely, anxiety, fear of failure, or low self-efficacy inhibit cognitive processing. ESL teachers must cultivate emotionally supportive environments where mistakes are reframed as learning opportunities, thereby fostering resilience and sustained engagement.

Lastly, cognitive flexibility, the capacity to adapt thinking to new situations, is still developing in young learners. While this flexibility enables children to acquire native-like pronunciation more easily, it also makes them vulnerable to cognitive rigidity when encountering linguistic irregularities or cultural nuances. Barac & Bialystok [2] found that bilingual exposure enhances cognitive flexibility, suggesting that carefully designed multilingual activities can foster adaptability and open-mindedness.

In summary, young learners' cognitive characteristics demand pedagogical approaches that are concrete, interactive, emotionally supportive, and developmentally aligned. ESL instruction must bridge cognitive limitations through scaffolding, multimodal input, and socio-culturally embedded practices.

Beyond general cognitive development, young learners' language acquisition is influenced by cognitive biases – systematic tendencies that affect information processing. These biases shape how children perceive, interpret, and retain new linguistic input, often operating below conscious awareness. Addressing these biases is critical to optimizing ESL instruction.

One of the most pervasive biases is confirmation bias. Children tend to favor information that aligns with their existing knowledge structures, disregarding contradictory input. In ESL contexts, this bias manifests when learners apply L1 grammatical rules or pronunciation patterns to L2, even after correction. For instance, syntactic transfer errors (e.g., incorrect word order) persist due to learners' reliance on familiar L1 structures [8]. Effective pedagogical interventions must create cognitive dissonance in a supportive context – using contrastive analysis, visual cues, and contextualized practice to gently challenge these entrenched patterns.

Anchoring bias further complicates phonological acquisition. Once a child internalizes an incorrect pronunciation, often from peer models or insufficiently scaffolded input, this initial anchor becomes resistant to change. Research by Gordo et al. [9] demonstrates that early corrective feedback, combined with

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multimodal reinforcement (e.g., visual mouth movement modeling), can recalibrate phonetic anchors. Repeated exposure in varying contexts is essential to solidify new, accurate anchors.

Cognitive dissonance, the discomfort caused by conflicting information, often leads to avoidance strategies in young learners. They may restrict their language use to "safe" vocabulary and structures, avoiding more complex or irregular forms. Orchard et al. [15] suggest that low-stakes, exploratory activities, such as storytelling, drama, and role-play, can reduce the aversiveness of dissonance, encouraging risk-taking and linguistic experimentation.

Stereotyping, though typically examined in social cognition, also affects linguistic attitudes. Preconceived notions about language varieties (e.g., associating "correct" English with a single accent) can limit learners' receptivity to diverse linguistic inputs. Integrating multicultural content and exposing learners to global English varieties fosters linguistic tolerance and adaptability [6].

Hindsight bias influences learners' self-assessment, leading them to overestimate prior knowledge or underestimate the difficulty of newly acquired skills. This misalignment affects motivation and learning strategies. Formative assessments that include self-reflection and peer feedback, as advocated by Frank et al. [5], help recalibrate learners' metacognitive awareness, aligning perception with actual performance.

Understanding these cognitive biases allows educators to design interventions that address not only surface-level errors but also the underlying cognitive distortions. Bias-aware teaching reframes errors as indicators of processing tendencies, guiding targeted and effective pedagogical responses.

Mitigating cognitive biases in young ESL learners requires a comprehensive, multi-layered approach that integrates cognitive psychology, second language acquisition theories, and practical classroom methodologies. Effective strategies should target specific biases such as confirmation bias, anchoring bias, cognitive dissonance, and stereotyping, while fostering metacognitive awareness, emotional resilience, and cognitive flexibility. Below, we outline the most evidence-backed strategies, methods, and tools to address these challenges holistically.

*1. Scaffolding and Zone of Proximal Development (ZPD) Alignment.*

Scaffolding remains the most fundamental strategy for addressing cognitive overload and guiding learners beyond entrenched biases. By providing structured support tailored to learners' current capabilities and gradually increasing task complexity, teachers can align instruction with each child's ZPD [19]. Techniques include visual organizers, sentence starters, guided discovery tasks, and step-by-step modeling. These strategies are particularly effective in dismantling confirmation bias by gently challenging learners' pre-existing linguistic assumptions within a supportive learning context.

*2. Explicit Strategy Instruction: Metacognition and Pragmatic Awareness.*

Teaching young learners to be aware of their cognitive processes is challenging but possible through age-appropriate metacognitive strategies. Bi [3] highlights the importance of explicit strategy instruction in L2 pragmatic learning. Methods include think-aloud protocols during language tasks, reflection journals (adapted with pictorial prompts), and structured peer discussions where learners articulate how they approached a task. This fosters early metacognitive awareness, enabling learners to recognize and adjust their cognitive biases in real-time.

*3. Total Physical Response (TPR) and Kinesthetic Learning.*

For biases rooted in rigid cognitive pathways, such as anchoring bias, methods that bypass purely verbal channels are crucial. Total Physical Response (TPR), which integrates language learning with physical movement, has been shown to enhance comprehension and retention among

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kinesthetic learners. By associating language with bodily actions, TPR reduces reliance on entrenched mental models, fostering greater cognitive flexibility [11].

*4. Gamification as Bias Disruptor.*

Gamification offers a dynamic means of addressing multiple biases simultaneously. Zhang & Hasim [22] identify key gamification elements – feedback, points, quizzes, digital badges, leaderboards, progress bars, storytelling, and avatars – that enhance engagement, motivation, and cognitive flexibility. Properly designed gamified activities create safe, low-stakes environments where learners can experiment with linguistic forms, receive immediate feedback, and progressively adjust erroneous patterns.

Crucially, gamification can counter anchoring bias by providing iterative corrective experiences, while addressing confirmation bias through tasks that require hypothesis testing and adaptation. Adaptive challenges, collaborative quests, and narrative-driven games promote cognitive flexibility, while visual progress indicators (e.g., progress bars) help recalibrate learners' self-perceptions.

*5. Storytelling and Narrative-Based Learning.*

Narrative-based instruction addresses cognitive biases by embedding linguistic structures within meaningful, context-rich stories. Storytelling fosters emotional engagement, enhances memory retention, and provides contextual cues that reduce reliance on biased heuristics [6; 7]. Visual storytelling, digital storybooks, and interactive narrative apps amplify these benefits by engaging multiple sensory modalities, facilitating deeper cognitive processing.

*6. Differentiated Instruction and Personalization.*

To effectively mitigate biases linked to individual learning profiles, differentiated instruction is indispensable. Tailoring tasks, materials, and pacing to learners' linguistic proficiency, cognitive style, and interests fosters greater engagement and reduces the risk of disengagement due to cognitive dissonance [11]. Techniques include tiered assignments, flexible grouping, and choice boards that empower learners to approach content from multiple angles.

*7. Collaborative Learning and Peer Scaffolding.*

Collaborative learning environments offer powerful opportunities to challenge individual biases through peer interaction. Structured pair and group work encourages learners to encounter alternative perspectives, negotiate meaning, and co-construct knowledge [13]. Strategic pairing – mixing higher- and lower-proficiency learners – facilitates peer scaffolding, while cooperative tasks reduce performance anxiety and foster cognitive flexibility.

*8. Technology-Enhanced Learning and Digital Tools.*

Digital tools such as interactive whiteboards, language learning apps, and online collaborative platforms provide immersive environments for bias-aware ESL instruction. Features like immediate feedback, adaptive learning pathways, and multimedia content address various cognitive biases by diversifying input channels and facilitating self-paced exploration [11; 22]. Virtual agents and AI-driven tutors offer personalized feedback that dynamically adjusts to learners' cognitive profiles.

*9. Feedback as a Cognitive Recalibration Tool*

Effective feedback transcends error correction; it functions as a recalibration mechanism for biased cognitive processes. Process-oriented feedback that highlights effort, strategy use, and incremental progress fosters a growth mindset and reduces fear of failure [10]. Peer feedback, self-assessment rubrics, and interactive feedback loops further enhance metacognitive engagement and challenge confirmation and hindsight biases.

*10. Safe and Respectful Communication Environment.*

Creating a psychologically safe classroom climate is fundamental for bias mitigation. Strategies include modeling active listening, promoting positive peer interactions, and establishing clear

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communication norms [1; 14]. Such environments encourage risk-taking, linguistic experimentation, and openness to alternative perspectives, essential for dismantling cognitive rigidity.

*11. Cultural Responsiveness and Anti-Stereotyping Practices.*

Explicitly addressing cultural diversity in content and pedagogy helps counter stereotyping biases. Incorporating multicultural narratives, exposing learners to diverse English varieties, and discussing global communication contexts foster a more inclusive linguistic worldview. These practices not only enhance linguistic competence but also promote cognitive and cultural flexibility.

Bridging the gap between theory and practice is essential when addressing cognitive biases in ESL education for young learners. Successful implementation requires tangible, classroom-tested approaches that resonate with children's developmental needs while subtly recalibrating their cognitive frameworks. The following section delves into empirically supported practices, real-life applications, and case studies that demonstrate how ESL educators mitigate cognitive biases and foster effective language acquisition.

Total Physical Response (TPR) is widely recognized as an effective method for mitigating anchoring bias and enhancing engagement among kinesthetic learners. By associating language input with physical movement, TPR bypasses over-reliance on verbal-linguistic cognitive channels and fosters embodied cognition. In early childhood ESL settings, teachers utilize TPR through activities such as action songs, command-based games ("Simon Says"), and role-play scenarios where learners physically enact vocabulary and phrases. This multisensory approach helps dislodge incorrect linguistic anchors by providing alternative, physically-grounded representations of language.

Gamification has transcended its motivational roots to become a strategic tool for cognitive bias mitigation. Zhang and Hasim [22] document multiple case studies where digital board games were integrated into ESL classrooms to create authentic language learning environments. These games offered situational plots that simulated real-life communication contexts, providing learners with immediate feedback and adaptive challenges. By requiring learners to adjust strategies based on dynamic game scenarios, gamification disrupts confirmation bias and encourages cognitive flexibility.

Furthermore, the integration of ubiquitous learning environments, where students engage in language tasks beyond the classroom through mobile devices, has proven effective in sustaining language practice and reducing dissonance avoidance behaviors. Activities like outdoor treasure hunts using QR codes or collaborative story relay races situate language learning in real-world contexts, making it more meaningful and less prone to cognitive simplification.

Narrative-based learning remains a cornerstone of bias-aware ESL instruction. Cojocnean [4] highlights a case where LEGO was employed as a storytelling scaffold in EFL classrooms for learners aged 7-10. By constructing story scenes with LEGO bricks, students engaged in collaborative, multimodal storytelling, enhancing oral fluency and cognitive flexibility. This hands-on approach not only contextualized vocabulary but also encouraged learners to navigate alternative linguistic structures, thereby mitigating stereotyping and confirmation biases.

Similarly, traditional storytelling methods have been revitalized through multimedia applications with significant improvements in expressive language skills among preschool learners exposed to interactive digital storytelling, underscoring the method's efficacy in fostering deep linguistic processing.

Collaborative learning environments offer fertile ground for challenging cognitive biases through peer interaction. Studies by Alanis [1] demonstrate that structured pair and group work fosters linguistic experimentation and exposure to diverse cognitive strategies. In practice,

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teachers implement strategic pairing (mixing higher- and lower-proficiency students) and structured cooperative tasks to facilitate peer scaffolding. Such interactions encourage learners to reconcile differing linguistic inputs, reducing the entrenchment of biased patterns and promoting metacognitive awareness.

Differentiated instruction, tailored to learners' proficiency levels, cognitive styles, and interests, is essential for addressing individual biases. Teachers employ tiered assignments, choice boards, and flexible grouping to accommodate diverse learning profiles. For instance, visual learners receive infographics and illustrated word maps, while auditory learners engage with songs and chants. This personalized approach ensures that each learner's cognitive pathways are optimally engaged, reducing the likelihood of fossilized errors stemming from cognitive rigidity.

The strategic use of digital resources – such as YouTube videos, interactive apps, and virtual agents – enhances input variety and reduces anchoring bias. However, challenges like irrelevant ads and content drift necessitate careful curation by educators [12]. Teachers mitigate these risks by employing safe educational platforms and integrating digital content into scaffolded lesson plans. Interactive applications like Quizizz, for instance, offer gamified quizzes with immediate feedback, allowing learners to recalibrate their linguistic assumptions in real time.

Creating a psychologically safe classroom environment is foundational for addressing cognitive biases. Strategies include modeling active listening, promoting positive peer interactions, and using casual communication styles to reduce anxiety [14; 17]. Teachers foster an atmosphere where mistakes are normalized, encouraging learners to engage in linguistic experimentation without fear of negative evaluation. This supportive environment mitigates dissonance avoidance and fosters a growth mindset.

Incorporating multicultural content and exposing learners to diverse English varieties counteracts stereotyping biases. Teaching materials featuring global English speakers, cultural narratives from various regions, and comparative linguistic analysis broaden learners' perspectives. Such practices not only enhance linguistic competence but also promote intercultural sensitivity, essential in a globalized communication landscape.

**Conclusions and research perspectives.** The analysis of cognitive processes and biases in teaching English as a second language to young learners demonstrates the necessity of a targeted, cognitively-informed approach to language instruction. Cognitive biases such as confirmation bias, anchoring bias, cognitive dissonance, and stereotyping are not incidental errors but fundamental barriers that shape how learners perceive, process, and retain linguistic input. If left unaddressed, these biases can fossilize errors and hinder linguistic progress despite the best-intended teaching efforts.

Throughout this study, we have outlined and examined effective strategies for mitigating these biases, including scaffolding, metacognitive strategy training, multimodal instruction, gamification, storytelling, differentiated learning, and peer-assisted approaches. Case studies demonstrate that practical classroom applications, such as interactive storytelling, gamified tasks, collaborative learning, and digital learning environments, can effectively recalibrate learners' cognitive frameworks when designed with bias-awareness in mind.

However, the current research landscape reveals several gaps that must be addressed. Longitudinal studies are needed to assess the long-term impact of these interventions on language acquisition and cognitive development. Moreover, more empirical work is required to isolate which specific strategies are most effective against distinct biases. The role of teachers' own cognitive biases in shaping learning

environments also remains underexplored and deserves focused attention.

In terms of future research, it is essential to integrate cognitive bias considerations into ESL curriculum design systematically. This means moving beyond isolated classroom practices to develop holistic curricula that explicitly address cognitive challenges faced by young learners. Furthermore, technological advancements, particularly AI-driven adaptive learning systems, offer promising avenues for personalized, bias-aware instruction that can dynamically respond to learners' needs.

Finally, cross-cultural validation of these strategies is critical. Cognitive biases may manifest differently across linguistic and cultural contexts, necessitating localized research to ensure the relevance and effectiveness of bias mitigation approaches in diverse educational settings.

In conclusion, fostering successful second language acquisition among young learners requires a teaching paradigm that is not only linguistically competent but also cognitively and psychologically informed. A concerted effort combining research, practice, and technological innovation will be vital in creating learning environments where young ESL learners can thrive cognitively, emotionally, and linguistically.

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