A Conceptual Framework for Integrating Artificial Intelligence into Positive Language Teaching: An Agenda for Research and Practice

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Abstract

This paper proposes a conceptual framework for integrating Artificial Intelligence (AI) into the Positive Language Teaching Approach (PLTA) to address persistent challenges in foreign language education while enhancing linguistic development and learner well-being. While the PLTA, grounded in positive psychology, emphasizes positive emotions, engagement, supportive relationships, meaning, accomplishment, holistic integration, and cultural sensitivity, AI provides powerful affordances such as adaptive feedback, intelligent tutoring, affective computing, immersive environments, and predictive analytics. By aligning these elements, the framework illustrates how AI can reinforce the core principles of the PLTA and create learner-centered environments that are technologically advanced, emotionally supportive, socially connected, and culturally responsive. The paper first outlines the theoretical foundations of the PLTA and AI, then introduces a conceptual model that demonstrates the systematic integration of AI tools with the PLTA principles. Pedagogical considerations are discussed to ensure that AI remains a supportive resource rather than a replacement for teachers, whereas Ethical concerns, such as data privacy, transparency, algorithmic bias, accountability, and equitable access, are also addressed. The paper ends with some practical recommendations for learners, teachers, institutions, and policymakers, with an emphasis on teacher training. Finally, it provides directions for future research, calling for interdisciplinary collaboration to validate and refine AI-supported PLTA practices. Overall, the study positions AI-enhanced PLTA as a transformative approach for reconceptualizing foreign language teaching and learning.

Keywords: Foreign language teaching and learning; positive psychology; artificial intelligence; the Positive Language Teaching Approach.

Yapay Zekânın Olumlu Dil Öğretimine Entegrasyonu için Kavramsal Bir Çerçeve

Özet

Bu çalışma, Yapay Zekânın Pozitif Dil Öğretimine entegrasyonuna yönelik kavramsal bir çerçeve önermekte, yabancı dil eğitiminde karşılaşılan kalıcı sorunları ele alırken hem dil gelişimini hem de öğrenenlerin iyi oluşunu desteklemeyi amaçlamaktadır. Pozitif psikolojiye dayanan Pozitif Dil Öğretimi; olumlu duygulara, katılıma, destekleyici ilişkilere, anlam ve başarı duygusuna, bütüncül entegrasyona ve kültürel duyarlılığa vurgu yaparken; Yapay Zekâ uyarlanabilir dönüt, akıllı öğretim, duygusal bilişim, sürükleyici öğrenme ortamları ve kestirimsel analizler gibi güçlü imkânlar sunmaktadır. Bu unsurların uyumlaştırılmasıyla, önerilen çerçeve; Yapay Zekânın Pozitif Dil Öğretiminin temel ilkelerini nasıl pekiştirebileceğini ve teknolojik olarak gelişmiş, duygusal açıdan destekleyici, sosyal olarak bağlantılı ve kültürel açıdan duyarlı öğrenen merkezli ortamlar oluşturabileceğini göstermektedir. Çalışmada öncelikle Pozitif Dil Öğretimi ve Yapay Zekânın kuramsal temelleri özetlenmiş, ardından Yapay Zekâ araçlarının Pozitif Dil Öğretimi ilkeleriyle sistematik entegrasyonunu gösteren kavramsal bir model sunulmuştur. Ayrıca pedagojik boyutlar ele alınarak Yapay Zekânın öğretmenlerin yerini almak yerine destekleyici bir kaynak olarak kalması gerektiği vurgulanmıştır. Bunun yanısıra veri gizliliği, şeffaflık, algoritmik önyargı, hesap verebilirlik ve adil erişim gibi etik kaygılar da tartışılmıştır. Çalışma, özellikle öğretmen eğitimi üzerinde durarak öğrenenlere, öğretmenlere, kurumlara ve politika yapıcılara yönelik bazı pratik önerilerle sonlanmaktadır. Son olarak, Yapay Zekâ destekli Pozitif Dil

Öğretimi uygulamalarının doğrulanması ve geliştirilmesi için disiplinlerarası iş birliği önerisi yapılmıştır. Genel olarak çalışma, Yapay Zekâ ile zenginleştirilmiş Pozitif Dil Öğretimini yabancı dil öğretimi ve öğrenimini yeniden kavramsallaştırmak için dönüştürücü bir yaklaşım olarak konumlandırmaktadır.

Anahtar Sözcükler: Yabancı dil öğretimi ve öğrenimi; pozitif psikoloji; yapay zekâ; Pozitif Dil Öğretimi Yaklaşımı

1. Introduction

Foreign language learning plays a central role in human development, offering a wide range of linguistic, cognitive, social, psychological, and professional benefits while remaining a challenging endeavor. Considering these benefits, learning a foreign language becomes increasingly vital, as it enables communication in the target language and fosters intercultural awareness, sensitivity, and empathy within both local and global contexts (Mercer, 2016; C. Wang et al., 2020). From an individual perspective, it supports cognitive development and flexibility by enhancing memory, problem-solving, and critical thinking skills (Li, 2016), which in turn contribute to self-confidence, self-efficacy, resilience, and a sense of accomplishment. These benefits extend to academic and professional domains, as language competence opens opportunities for international collaboration and contributions to fields such as education, science, technology, and the arts (Park, 2022). Beyond these advantages, foreign language learning is widely recognized as a multidimensional process that goes beyond linguistic competence, encompassing cognitive, social, and psychological dimensions. Linguistically, it promotes phonological awareness, grammatical knowledge, pragmatic competence, and metalinguistic reflection, while also heightening sensitivity to cross-linguistic influences (Bialystok et al., 2012; Ortega, 2014). Cognitively, it enhances executive functions, such as attention, working memory, and flexibility (Bak et al., 2014; Kroll & Dussias, 2017), and further develops higher-order skills, including problem-solving and critical thinking (Fürst & Grin, 2018). On a social level, learning a foreign language broadens global perspectives, fosters intercultural understanding, and strengthens social networks (Moeller & Abbott, 2018). From a psychological perspective, it contributes to personal growth (Kroll & Dussias, 2017), resilience (Chen et al., 2025), and self-confidence (Ketebayeva et al., 2024), while fostering positive emotions and well-being (MacIntyre & Gregersen, 2012) and mitigating stress and anxiety through self-efficacy and emotional regulation (Dewaele et al., 2018). Despite its well-documented benefits, learning a foreign language is accompanied by several challenges that hinder learners' progress. One of the most prominent issues is foreign language anxiety, an affective state that often leads to avoidance of language use (Horwitz et al., 1986). More specifically, its main components, fear of negative evaluation, test anxiety, and communication apprehension, negatively affect learners' performance and create significant barriers to achievement (Aydın, 2008). Moreover, learners experience demotivation and even amotivation, particularly when their individual needs, expectations, and interests are overlooked in the teaching process (Aydın, 2020; Jang, 2008). These problems mainly result in disengagement from classroom tasks, low levels of motivation, and ultimately diminished self-confidence, competence, and performance, accompanied by negative perceptions of language learning (Clément et al., 1994). These difficulties are also rooted in traditional perspectives that prioritize linguistic and cognitive aspects of language acquisition while neglecting affective and relational dimensions (Akkaş et al., 2022; Aydın, 2024; Aydın & Denkci Akkaş, 2023). In other words, an overemphasis on linguistic and cognitive goals, without integrating positive elements such as emotions, engagement, relationships, meaning, and accomplishment, can render the learning process mechanical, leading to disconnection, demotivation, isolation, stress, and anxiety (Aydın & Tekin, 2023; Falout, 2012). Thus, it becomes evident that incorporating principles of positive psychology into foreign language learning holds strong potential for addressing these problems and fostering more meaningful, enjoyable, and effective learning experiences (Aydın, 2025a). Moreover, the growing integration of AI into foreign language learning is of increasing importance, as it offers new possibilities to address these challenges by providing personalized support, adaptive feedback, and opportunities for more engaging and meaningful learning experiences.

In light of the challenges and opportunities outlined above, there is a pressing need for new theoretical perspectives that bridge advances in language teaching pedagogy with emerging technologies. From this perspective, while the PLTA provides a human-centered framework grounded in positive psychology, AI represents one of the most significant innovations shaping the future of language education (Aydın &

Zeinolabedini, 2024; Sayici & Aydın, 2025). Bringing these two domains together may offer a unique opportunity to reconceptualize how a foreign language is taught and learned in ways that support linguistic, cognitive, social, and psychological development. Thus, there is a strong need to advance theoretical discussions on the PLTA while simultaneously addressing the growing role of AI in foreign language teaching and learning. Speaking more specifically, the PLTA emphasizes the incorporation of positive psychology principles into foreign language teaching, while AI has emerged as a transformative force in teaching and learning by offering personalized learning experiences (Chen et al., 2021), adaptive and automated feedback (Altınay & Aydın, 2025), innovative forms of interactions (Ballıdağ & Aydın, 2025), and intelligent tutoring (Tafazoli et al., 2019). Despite the parallel growth of the PLTA and AI, there has been limited scholarly effort to conceptualize their integration within a coherent framework. Thus, by foregrounding both constructs, the current paper aims to provide a theoretically grounded model that explains how AI can be systematically harnessed to reinforce the principles of the PLTA.

Despite extensive research on Positive Psychology and growing attention to AI in foreign language learning and teaching, current studies tend to examine these domains in isolation. In other words, existing studies on positive psychology in foreign language learning and teaching provide rich conceptual discussions of well-being, engagement, and motivation (Aydın, 2024; Aydın & Tekin, 2023), but lack operational models that connect these constructs to technology-mediated pedagogical practice (Aydın, 2025b). Similarly, AI-related studies frequently enumerate instructional affordances without linking them to affective, relational, or ethical dimensions of learning. The present framework moves beyond descriptive listings by proposing a systematic and human-centered alignment between the PLTA principles and specific AI affordances. This alignment not only integrates affective and technological perspectives but also introduces a coherent conceptual model that bridges theoretical reasoning with practical application in foreign language education.

Depending on the aim of the current paper, the conceptual framework is structured around six interrelated subsections that together explain how AI can be integrated into the PLTA. The first subsection introduces the PLTA by establishing its theoretical roots in positive psychology, whereas the second one provides information about the role of AI in foreign language teaching and learning. The following subsection examines how AI can be integrated into the PLTA. Building on this foundation, the paper then presents a conceptual model that illustrates the alignment between AI affordances and the PLTA principles, followed by a discussion of pedagogical and ethical considerations within the scope of AI-supported PLTA. The implications of the framework are then addressed across multiple stakeholders. Additionally, recommendations are provided to guide future research inquiries in this emerging field. Finally, the paper presents concluding remarks on the potential of AI-enhanced PLTA.

2. The Positive Language Teaching Approach

While positive psychology elements make important contributions to foreign language learning (Aydın, 2024; Aydın & Tekin, 2023; Y. Wang et al., 2021), it is necessary to reevaluate current language teaching approaches from a positive psychology perspective. Regarding its contributions, *positive emotions* in language classes foster curiosity, joy, and excitement (Oxford, 2016), whereas *engagement* in activities supports the development of language skills and knowledge areas (Halici Page & Mede, 2018). Moreover, good *relationships* strengthen a sense of belonging and provide teacher and peer support (Osterman, 2023). Finally, while having *meaningful* purposes in language learning enhances motivation, long-term retention, career planning, and cultural connections (Busse & Walter, 2013), *achievement* builds self-confidence, competence, and performance (Clément et al., 1994). Nonetheless, such contributions are not fully realized within the scope of current language teaching approaches and techniques (Aydın, 2025a). Thus, there is a strong need to reevaluate current language-teaching approaches from a positive psychology perspective. As an example, while the Grammar-Translation Method emphasizes translation, grammar, and error correction, relying on memorization (Nisha, 2024), the Audio-Lingual Method relies on rote memorization and repetition drills (Kleser, 1971). Moreover, although the Direct Method promotes listening and speaking skills (Richards & Rodgers, 2014), it often excludes collaboration, flexibility, and emotional support. Similarly, the Silent Way may leave learners feeling unsupported, anxious, and less confident due to the lack of guidance and interaction. While the Communicative Language Teaching encourages interaction and communicative competence (Larsen-Freeman, 2020), learners may feel stressed and anxious in real-time communication. Task-Based Language Teaching also leaves little space for emotional connections, intrinsic motivation, or alignment with individual needs (Aydın, 2025a). In conclusion, current methods

remain limited in fostering positive emotions, engagement, relationships, meaning, and accomplishment, which are essential for effective learning. To address these shortcomings, the PLTA emphasizes the integration of positive psychology elements into foreign language teaching and learning. Below, the theoretical foundations of the PLTA are presented.

Positive psychology emerged as a reaction to the limitations of traditional psychology, shifting attention from deficits to strengths, happiness, and well-being (Alex Linley et al., 2006). It emphasizes fulfillment, satisfaction, and resilience (Seligman & Csikszentmihalyi, 2000). It proposed the PERMA model, standing for positive emotions, engagement, relationships, meaning, and accomplishment, as the core components of well-being (Seligman, 2018). According to the model, *positive emotions*, such as hope, curiosity, and joy, broaden perspectives, reduce stress, and foster creativity (Fredrickson, 2004). Engagement, on the other hand, promotes flow when activities strike a balance between challenge and proficiency (Csikszentmihalyi, 2020). In addition, supportive *relationships* provide a sense of belonging, encouragement, and resilience (Wissing et al., 2021), whereas meaning connects learning to personal and cultural goals, career aspirations, and academic achievements, thereby strengthening intrinsic motivation and persistence (Rosso et al., 2010). Last, *accomplishment* builds competence, confidence, and long-term motivation (Seligman, 2018).

The PLTA adapts the PERMA model of positive psychology to foreign language learning, integrating holistically and incorporating cultural sensitivity as essential components. First, *positive emotions* are cultivated through engaging tasks, humor, constructive feedback, and the celebration of achievements, thereby reducing anxiety and building resilience. Second, *engagement* is promoted by immersive, meaningful activities such as role-plays, real-life simulations, technology-enhanced tools, and projects that sustain flow and personal satisfaction. Third, *relationships* are fostered through collaborative storytelling, peer mentoring, rituals, and positive teacher-student communication, all of which enhance a sense of belonging, trust, and overall well-being. Fourth, *meaning* connects language learning to learners' cultural, personal, and professional goals through cultural explorations, discussions of traditions, and tasks linked to future aspirations, fostering intrinsic motivation and perseverance. Fifth, *accomplishment* is emphasized by setting achievable goals, using constructive feedback, documenting progress, and recognizing long-term achievements to strengthen self-confidence and resilience. Sixth, *holistic integration* ensures that linguistic, cognitive, social, and emotional needs are balanced within a learner-centered approach, creating flexible, stress-free, and reflective environments. Finally, *cultural sensitivity* highlights authentic cultural materials, discussions of similarities and differences, and multicultural dialogue, enabling learners to develop tolerance, cross-cultural competence, and deeper connections to the target language and culture (Aydın, 2025a).

To operationalize these components within classroom contexts, each element of the PLTA can be identified through observable indicators. For instance, **positive emotions** are evident when learners express enjoyment, curiosity, and reduced anxiety during communicative or gamified tasks, often supported by teachers' constructive feedback and encouragement. **Engagement** can also be observed in sustained attention, active participation, and persistence in problem-solving or collaborative activities. Moreover, **relationships** manifest through supportive teacher–student and peer interactions that foster trust, empathy, and a sense of belonging. M**eaning** emerges when learners connect language tasks to their personal, cultural, or professional goals, recognizing the relevance of learning to their broader life experiences. In addition, **accomplishment** is reflected in learners' goal setting, visible progress, and celebration of achievements through self-assessment or performance-based evaluations. **Holistic integration** is demonstrated when linguistic, cognitive, social, and emotional dimensions are balanced, allowing learners to engage reflectively and confidently. Finally, **cultural sensitivity** is observable in the inclusion of authentic cultural materials, discussions of diverse perspectives, and learners' displays of tolerance and intercultural understanding. Together, these indicators offer tangible means for teachers and researchers to assess how PLTA principles are enacted in practice.

The principles of the PLTA approach are structured around its theoretical background, objectives, syllabus, teacher and learner roles, teaching techniques, and assessment. First, the *theoretical basis* integrates positive psychology and language pedagogy to promote resilience, joy, curiosity, and well-being alongside linguistic competence. Second, its *objectives* encompass linguistic goals of fluency and accuracy in real-life contexts, emotional goals of reducing anxiety and fostering motivation, and social goals of building confidence and a sense of belonging. Third, the *syllabus* strikes a balance between language development and cultural content, incorporating real-life tasks, games, projects, and collaborative activities that progress

from simple to complex, and are adaptable to formal, informal, and online contexts. Fourth, *teachers* act as facilitators, mentors, and emotional supporters, while learners actively participate, collaborate, reflect, and set personal goals through self-assessment. Fifth, *teaching techniques* focus on tasks that promote positive emotions, engagement, relationships, meaning, and accomplishment. Last, *assessment* emphasizes performance-based tasks, peer feedback, and reflective portfolios that evaluate both linguistic growth and emotional development.

In conclusion, the PLTA emerges as a response to the limitations of traditional methods, which often focus on memorization, error correction, or rigid tasks and therefore fail to foster positive emotions, engagement, relationships, meaning, and accomplishment. Rooted in positive psychology, the PLTA adapts the PERMA model to language learning by cultivating joy and resilience, promoting immersive engagement, strengthening relationships, connecting learning to personal and cultural goals, and recognizing accomplishments to build confidence and persistence. It further expands this framework through holistic integration and cultural sensitivity, balancing cognitive, emotional, and social needs while fostering cross-cultural competence. The principles of PLTA are reflected in its theoretical grounding, objectives, syllabus, teacher and learner roles, teaching techniques, and assessment, all of which emphasize learner-centered practices, supportive teacher guidance, meaningful tasks, and performance-based evaluations. Overall, PLTA provides a comprehensive framework for enhancing both language proficiency and learner well-being, and its potential can be further strengthened through the integration of AI.

3. Artificial Intelligence in Foreign Language Teaching and Learning

AI is the simulation of human intelligence by machines or systems designed to learn, adapt, synthesize, self-correct, and perform complex tasks (Popenici & Kerr, 2017), and a multidisciplinary field that combines computer science and linguistics, capable of multitasking such as understanding, learning, and acquiring knowledge (Aydın & Zeinolabedini, 2024; Korteling et al., 2021). Within this scope, it can be described as enabling machines to think and act like humans in areas including problem-solving, decision-making, perception, and comprehension (Sarker, 2022). AI is generally categorized into two forms. First, *Narrow (Weak) AI* performs specific and predefined tasks, such as facial recognition, translation, or recommendation systems. Second, *General (Strong)* AI resembles human-like intelligence and can learn, infer, and apply knowledge across diverse contexts (Searson et al., 2024; Xu et al., 2021).

In the contexts of foreign language learning and teaching, AI can be defined as a set of computational tools and systems that support self-directed, self-regulated, and autonomous learning (Sayici & Aydın, 2025). AI tools can provide scaffolding tailored to learners' readiness (Vygotsky, 1978a) and facilitate interaction through comprehensible input and negotiation of meaning (Ellis, 1999). It includes tools, environments, and applications such as Automatic Evaluation Systems, Neural Machine Translation, Intelligent Tutoring Systems, Chatbots, Intelligent Virtual Environments, and Affective Computing. Within this scope, AI serves as a pedagogical mediator that enhances engagement, offers personalized feedback, reduces anxiety, builds self-efficacy, and promotes both linguistic development and learner well-being (Aydın & Zeinolabedini, 2024). Within this scope, AI in foreign language teaching and learning can be viewed as both a technical system and a pedagogical mediator, automating routine tasks, delivering personalized feedback, and fostering engagement. Thus, AI is not only a technological innovation but also a means of supporting cognitive, emotional, and social dimensions of language learning, offering learners enriched opportunities to develop linguistic competence and overall well-being.

AI is closely connected to several educational theories that provide conceptual foundations for its use in teaching and learning. One of the most influential is **Activity Theory**, which originates from Vygotsky's (1978b) triadic model of subject, object, and tools, later expanded by Engeström (2001) to include rules, community, and division of labor. Within this framework, the components of an activity system are interrelated and mutually influential. In foreign language learning, AI can be conceptualized as a mediational tool that supports learners' interactions with tasks and contexts, thereby facilitating the achievement of learning outcomes. Another theoretical foundation is **constructivism**, which emphasizes learners' active role in constructing knowledge. Cognitive constructivism, rooted in Piaget's work (Piaget & Inhelder, 2015), focuses on individual cognitive development, while Social Constructivism emphasizes the social construction of knowledge (Adams, 2006). In this regard, AI can function as a scaffolding mechanism by organizing tasks according to learners' intellectual readiness and creating collaborative opportunities that enhance both individual and social dimensions of learning. AI also draws on **Adaptive**

Learning, which relies on computer algorithms to adjust instruction to learners' unique needs (Kolchenko, 2018). Through personalization and real-time feedback, AI systems can provide tailored learning pathways that sustain engagement and optimize outcomes. Similarly, **Connectivism (Siemens, 2005)** views learning as a process of forming and navigating networks of information. AI aligns with this theory by enabling learners to access and evaluate vast amounts of information, filter out irrelevant content, and share knowledge effectively within digital networks. In addition, **Cognitive Load Theory** provides insights into how learners process new information and highlights the need to minimize unnecessary cognitive demands (Paas et al., 2010). AI supports this process by adapting instructional materials and providing scaffolds that reduce extraneous load, thereby allowing learners to focus on essential cognitive tasks. **Social Cognitive Theory** also underpins AI-supported learning by framing it as a self-regulated, agentive process of initiative, resourcefulness, and persistence (Bandura, 1991). In this context, AI tools promote autonomy by offering opportunities for learners to direct their own progress and monitor their development. Finally, the **Technology Acceptance Model** explains adoption and use of AI in terms of perceived usefulness and ease of use (Davis & Granić, 2024). When learners and teachers believe that AI tools are both effective and user-friendly, they are more likely to adopt and consistently use them in educational contexts. This perspective is especially relevant to language learning, where high cognitive load and affective challenges often require technologies that are accessible, supportive, and motivating. Complementary approaches, such as learner-centeredness (Dang, 2006), active learning (Meyers, 1993), blended learning (Hockly, 2018), and flipped learning (Ercan & Aydın, 2022; Romero et al., 2019) further reinforce the role of AI in creating interactive, student-centered, and technology-enhanced environments. In conclusion, these theories provide a strong conceptual basis for understanding AI in foreign language learning and teaching since they emphasize its potential as a mediational tool, a scaffold for individual and social development, a mechanism for reducing cognitive load, a catalyst for autonomy, and a technology whose adoption depends on perceived value and usability.

The integration of AI into foreign language learning and teaching can be better understood when examined through the lens of related theories, which not only provide conceptual grounding but also guide practical applications. To begin with, Activity Theory positions AI as a mediational tool that links learners with tasks and contexts; in practice, this role is exemplified by chatbots and intelligent virtual environments that simulate authentic communication and role-playing (Burgues et al., 2024). In addition, because constructivism supports AI as a scaffolding mechanism, while cognitive and social constructivism emphasize individualized feedback and collaboration, intelligent tutoring systems can adjust tasks to learners' readiness, and AI-based platforms can facilitate group projects and peer interaction (Islam et al., 2024). Moreover, Adaptive Learning theory reinforces the personalized dimension of AI by employing algorithms to adjust instruction in real time, as demonstrated by adaptive grammar or vocabulary tutors that dynamically respond to learner performance (Aravind et al., 2025). Similarly, Connectivism emphasizes the role of AI in helping learners navigate and curate vast networks of information, with recommendation systems guiding them toward authentic texts, videos, and cultural content that align with their interests (Andriani, 2025). Furthermore, considering that Cognitive Load Theory emphasizes reducing extraneous demands on working memory, AI contributes by simplifying instructional design through writing assistants that provide focused feedback or reading platforms that highlight essential vocabulary (Zhao, 2025). From another perspective, Social Cognitive Theory highlights the role of agency, persistence, and self-regulation, which AI supports through dashboards and predictive analytics that enable learners to set goals, track progress, and sustain motivation (Susnjak et al., 2022). Equally important, the Technology Acceptance Model explains why learners and teachers adopt AI tools, emphasizing perceived usefulness and ease of use, which accounts for the popularity of user-friendly applications such as mobile translators and conversational bots (Petrović & Jovanović, 2021). Finally, learner-centeredness, active learning, blended learning, and flipped learning demonstrate how AI can enrich interactive and student-centered environments by offering adaptive materials, pre-class exercises, and real-time analytics (Meng et al., 2025). These theoretical and practical perspectives illustrate that AI is not only a technical system but also a pedagogical resource that enhances personalization, engagement, and effectiveness in foreign language teaching and learning. Within this perspective, AI can also be systematically integrated into the PLTA, as it has the potential to reinforce its core principles. In conclusion, three core perspectives that provide conceptual and practical guidance for designing AI-supported foreign language teaching should be underlined. First, the Activity Theory explains how artificial intelligence serves as a mediational tool that connects learners, tasks, and the surrounding learning community, highlighting its role in facilitating collaboration, contextual interaction, and equitable division of labor in group work. Second, the Self-Determination Theory emphasizes the motivational dimension, showing how artificial intelligence can

foster autonomy, competence, and relatedness through adaptive feedback, learner choice, and personalized goal setting. Third, the Cognitive Load Theory contributes to instructional design by illustrating how artificial intelligence can minimize extraneous cognitive demands, simplify complex learning materials, and provide scaffolding that enhances comprehension and retention. These perspectives form an integrated theoretical basis that explains not only why artificial intelligence is pedagogically relevant but also how it can be purposefully designed to support affective, cognitive, and social dimensions of foreign language learning.

4. Integrating AI into the PLTA

Building on the foundations of both PLTA and AI, the integration of these domains offers a promising pathway to address persistent challenges in foreign language teaching and learning. On the one hand, the PLTA emphasizes cultivating positive emotions, sustained engagement, supportive relationships, meaningful learning, and a sense of accomplishment, all of which are essential to enhancing both linguistic development and learner well-being. On the other hand, AI provides powerful tools such as adaptive feedback, intelligent tutoring, immersive environments, and affective computing that can systematically reinforce these principles in practice. By aligning AI applications with the principles of the PLTA, it becomes possible to create learner-centered environments that are not only technologically enhanced but also emotionally supportive, socially connected, and cognitively effective. In this way, integrating AI into the PLTA offers a comprehensive and innovative framework for rethinking language teaching and learning that addresses both performance outcomes and holistic learner development.

To illustrate how AI can be systematically integrated into the PLTA, it is essential to consider the core components, namely, positive emotions, engagement, supportive relationships, meaning, accomplishment, holistic integration, and cultural sensitivity. At the same time, AI encompasses a wide range of tools and applications, including adaptive feedback systems, intelligent tutoring, immersive virtual environments, and affective computing, all designed to personalize instruction and support active engagement. By examining these elements together, a clearer picture emerges of how AI can reinforce the principles of the PLTA in practice, thereby creating more human-centered, technologically enhanced, and effective learning environments.

AI can play a key role in fostering *positive emotions* within language classrooms. For instance, by providing stress-free practice environments through chatbots or intelligent virtual environments, AI reduces communication apprehension and fear of negative evaluation (Ballıdağ & Aydın, 2025). Gamified tasks and real-time supportive feedback also stimulate joy, curiosity, and excitement, which are central to sustaining motivation (Choustoulakis et al., 2025). Furthermore, personalized recognition of even small achievements, such as mastering a new word or completing a short dialogue, reinforces learners' confidence, resilience, and optimism (Ismail & Alharkan, 2024). In this way, AI applications directly support the PLTA in cultivating positive emotions that counterbalance anxiety and enhance overall well-being.

Engagement is another principle of the PLTA that AI can systematically reinforce. For example, adaptive learning systems maintain learner interest by adjusting difficulty levels to balance challenge and proficiency, creating optimal conditions for flow (Chergui et al., 2024). Moreover, AI-enhanced activities such as interactive storytelling, immersive role-plays, and real-life simulations captivate learners' attention (Er-Rafyg et al., 2024) while providing meaningful opportunities to practice language skills. By aligning tasks and materials with individual learner profiles, AI fosters sustained involvement and curiosity, helping students remain focused, motivated, and active participants in the learning process (Alenezi, 2023).

AI also supports the *relationa*l dimension of the PLTA through tools that facilitate collaboration and communication. For example, AI can automate routine administrative and corrective tasks, freeing teachers to focus on providing emotional support and cultivating rapport (Soral Karayer, 2024). At the same time, intelligent platforms can mediate peer interaction, enabling learners to collaborate on group projects, exchange feedback, and engage in meaningful dialogue (Magnisalis et al., 2011). These systems also help promote inclusivity and fairness by ensuring that all learners have equitable opportunities to participate (Bi, 2025). As a result, AI contributes to stronger bonds between students and teachers, reinforcing the sense of belonging and social connectedness central to the PLTA.

Meaning, which refers to learners' ability to connect language study with personal goals and broader cultural contexts, can be enhanced through AI in multiple ways. Intelligent systems can provide access to authentic intercultural dialogues, virtual agents, and contextualized scenarios that highlight the real-world relevance of language use (Katsarou et al., 2023). By personalizing pathways according to learners' aspirations, careers, or cultural interests, AI ensures that tasks feel purposeful and rewarding. In turn, this connection to meaningful goals sustains intrinsic motivation, deepens cultural awareness (Xia et al., 2022), and supports persistence in the face of challenges.

AI also has the potential to strengthen learners' sense of *accomplishment* by making progress visible and tangible. For instance, dashboards, progress trackers, and predictive analytics enable students to monitor their development in real-time (J. Wang & Wang, 2024), celebrating milestones as they progress. Moreover, automated feedback systems provide immediate, constructive input that highlights both strengths and areas for improvement, helping learners build confidence (Altınay & Aydın, 2025). By recognizing achievements, AI reinforces persistence and resilience while boosting self-efficacy (Ismail & Alharkan, 2024), which aligns closely with the emphasis of the PLTA on accomplishment as a driver of motivation and long-term success.

Holistic integration, which balances linguistic, cognitive, social, and emotional dimensions, can be effectively supported by AI. As an example, adaptive tools can provide flexible pacing tailored to learners' capacities (Akavova et al., 2023), ensuring that instruction remains challenging without becoming overwhelming. Reflective platforms and personalized learning environments also connect language learning to broader personal development (Laakkonen & Taalas, 2015) while promoting growth across multiple domains. By integrating emotional engagement with cognitive development and social interaction, AI enables a learner-centered approach that mirrors the holistic vision of the PLTA regarding foreign language learning.

Finally, AI contributes to *cultural sensitivity*, an extended component of the PLTA. Intelligent systems can curate authentic cultural content, exposing learners to traditions, values, and perspectives from diverse communities (Tubman, 2024). Translation tools and intercultural simulations facilitate understanding across languages and cultures (Shadiev et al., 2019), enabling learners to develop tolerance and foster global citizenship. At the same time, AI applications can promote multicultural dialogue while respecting learners' local cultural identities (Sharma, 2025). In this way, AI fosters cross-cultural competence and enriches learners' connections to both the target and native cultures by reinforcing the PLTA on cultural awareness and empathy.

In conclusion, a conceptual model for integrating AI into the PLTA builds on the principles of the PLTA. At its core, the model aligns the key components of the PLTA with specific AI tools and functions, demonstrating how technology can be harnessed to reinforce human-centered pedagogy while preserving the affective, cognitive, and social dimensions of language learning. To begin with, AI fosters positive emotions such as joy, curiosity, and resilience through gamified learning environments, chatbots that offer stress-free practice, and affective computing systems that recognize emotions and deliver supportive feedback. In addition, engagement is sustained through adaptive learning systems and intelligent tutoring applications that dynamically adjust task difficulty, balance challenge and skill, and enable immersive activities such as role-plays and simulations. Moreover, AI strengthens relationships by automating routine administrative tasks, allowing teachers to focus on emotional support. It also facilitates peer collaboration through group projects, shared feedback, and inclusive participation. AI also enhances meaning by connecting language study to learners' goals and identities by curating authentic intercultural dialogues, employing virtual agents, and creating personalized pathways linked to career or cultural interests. A further contribution lies in accomplishment, as dashboards, predictive analytics, and progress trackers make development visible and tangible, while automated feedback highlights strengths and areas for growth, boosting self-efficacy, confidence, and persistence. Similarly, holistic integration is supported through adaptive pacing, reflective platforms, and personalized learning environments that balance linguistic competence with psychological well-being.

Finally, AI promotes cultural sensitivity by curating authentic cultural content, supporting translation and intercultural simulations, and fostering multicultural dialogue that encourages both tolerance and the preservation of local identities. To this end, it can be inferred that this model demonstrates that AI is not only a technological innovation but also a pedagogical partner that systematically reinforces the PLTA

principles, providing a structured pathway for designing language-learning environments that are technologically advanced, emotionally supportive, socially connected, and culturally sensitive. Table 1 illustrates the alignment between the components of the PLTA and the affordances of artificial intelligence through a set of design patterns.

Table 1.
Mapping the PLTA components to AI Affordances

PLTA Components	AI Affordances	Tool Examples	Data Inputs	Teacher Moves	Learner Tasks
Positive Emotions	Affective computing, gamification	Chatbots, emotion-recognition apps	Facial expression data, engagement logs	Encouragement, monitoring affective states	AI-based games or storytelling
Engagement	Adaptive feedback, intelligent tutoring	Adaptive tutors	Performance metrics, learning pace	Task difficulty, Personalized challenges	Interactive tasks, progress
Relationships	Social AI tools, collaborative platforms	AI discussion boards, peer feedback systems	Interaction data, message content	Peer mentoring, empathy	AI-assisted discussions
Meaning	Semantic analysis, content recommendation	Recommender systems, AI essay feedback tools	Topic relevance, learner interests	Reflective tasks, content to goals	Culturally relevant materials
Accomplishment	Predictive analytics, progress dashboards	Learning analytics systems	Achievement data, test results	Growth, recognition	dashboards, reflection on progress
Holistic Integration	Intelligent tutoring, multimodal systems	Virtual classrooms, 3D immersive tools	Multimodal data	Affective and cognitive feedback	Integrative projects combining skills
Cultural Sensitivity	Cultural corpus tools	AI translation systems, intercultural virtual reality tools	Linguistic and cultural corpora	Comparison and discussion	Cultural nuances via AI-generated texts

5. Pedagogical Considerations

The integration of AI into the PLTA requires careful attention to pedagogical principles to ensure that technological affordances enhance, rather than replace, human-centered teaching. First, the design of AI-enhanced tasks should remain learner-centered, aligning with individual needs, proficiency levels, and personal goals. From this perspective, while AI provides personalization through adaptive feedback and real-time adjustments, teachers should ensure that activities remain meaningful, contextually relevant, and emotionally supportive. Second, the role of the teacher shifts from being the sole source of knowledge to that of a facilitator, mentor, and emotional guide. In other words, since AI can automate routine functions such as error correction or administrative tracking, it allows teachers to focus on building rapport, reducing anxiety, and fostering positive classroom relationships. Third, balance is critical in maintaining cognitive load. That is, while AI tools can scaffold learning by simplifying input and highlighting key elements, excessive reliance on technology may overwhelm learners or diminish opportunities for authentic interaction. Fourth, pedagogical planning should ensure integration across modalities. Within this scope, AI applications can enhance pre-class preparation, in-class interaction, and post-class reflection by creating a blended or flipped learning environment that sustains engagement across settings. Fifth, inclusivity and equity must remain central considerations. AI tools should be used to provide equal opportunities for participation, ensuring that learners of different backgrounds, abilities, and anxiety profiles can benefit without being excluded. In addition, pedagogical implementation should emphasize reflective practice. Teachers and learners alike should critically evaluate the role of AI in shaping emotions, engagement, relationships, meaning, accomplishment, and cultural awareness, ensuring that the use of technology remains consistent with the principles of the PLTA. To further assist teachers in planning and managing AI-supported instruction, a structured checklist may be used to align learning outcomes with the PLTA components, AI tools, potential risks, and accommodations. This framework helps ensure that lesson design remains intentional, equitable, and balanced across technological and human elements. In practice, teachers should also manage time-on-task by alternating between AI-based and human-led activities, apply tool rotation to sustain engagement, and maintain a healthy screen-to-human talk ratio to preserve the relational and emotional dimensions central to the PLTA.

6. Ethical Considerations and Limitations

While the integration of AI into the PLTA offers significant opportunities, it also raises several limitations and ethical concerns that must be addressed. First, issues of data privacy and security are paramount, as AI systems rely heavily on collecting and processing learner data, which may expose sensitive personal and academic information (Muli, 2024). Without robust measures, the risk of misuse may become a major concern. Second, there is the challenge of algorithmic bias, whereby AI tools may inadvertently reproduce or reinforce inequalities based on factors such as race, gender, language background, or cultural identity (Shuford, 2024). This is especially critical in language learning, where cultural sensitivity is a core principle of the PLTA. Third, overreliance on technology may diminish opportunities for authentic human interaction, creativity, and critical thinking (Kushlev et al., 2017) if AI tools are used as substitutes rather than supports. Such reliance could also weaken the teacher's role as a mentor and emotional guide, which is essential for cultivating positive emotions, relationships, and well-being. Fourth, issues of access and equity must be considered (Murphy, 2023), as not all learners or institutions have equal access to high-quality AI tools and digital infrastructure. This digital divide risks exacerbating inequalities rather than reducing them. Fifth, the transparency of AI systems remains limited (von Eschenbach, 2021), making it difficult for teachers and learners to fully understand how decisions or feedback are generated. Sixth, ethical responsibility and accountability present a challenge (Smith, 2021), as it is often unclear who should be held accountable for errors, misjudgments, or adverse outcomes caused by AI in teaching and learning contexts. Finally, there are pedagogical limitations, including the possibility that AI may oversimplify complex affective dimensions of learning, such as motivation, resilience, or cultural awareness, which cannot be fully reduced to algorithms. In sum, while AI has strong potential to reinforce the principles of the PLTA, its adoption must be accompanied by careful ethical reflection, critical evaluation, and ongoing monitoring to ensure that technology serves as a supportive tool. These ethical dimensions can be more effectively addressed through a structured approach that identifies potential risks and corresponding mitigation strategies, as illustrated in Table 2.

Table 2.
Risk mitigation strategies

Ethical risk	Description	Mitigation strategy
Data Privacy and Security	Unauthorized use or exposure of learner data during AI processing	Using anonymized datasets, encrypted storage, and informed consent procedures
Algorithmic Bias	Biased datasets may lead to unfair or discriminatory outcomes	Conducting bias audits, diversifying data sources, and including human oversight in AI decisions
Overreliance on AI	Excessive dependence may reduce teacher agency and learner creativity	Encouraging hybrid approaches, integrating teacher judgment, and reflective learning
Transparency and Accountability	Lack of clarity about how AI systems make decisions	Providing explainable AI interfaces and clear documentation for stakeholders
Ethical Awareness and Training	Limited teacher preparedness for ethical AI use	Implementing continuous professional development and ethics-centered AI literacy training

7. Practical Recommendations

Considering the integration of AI into the PLTA, several practical recommendations can be made. First, foreign language learners should be encouraged to actively use AI tools for self-directed, autonomous learning by setting personal goals and monitoring their progress. They should also engage with adaptive platforms that provide personalized feedback, reduce anxiety, and strengthen self-confidence, while also practicing critical evaluation of AI-generated content to ensure reliability and accuracy. In addition, learners are advised to balance technology use with human interaction, seeking meaningful collaboration with peers and teachers to maintain the social and emotional dimensions of learning. Second, language teachers can integrate AI as a supportive partner rather than a replacement, using it to personalize instruction, provide

adaptive feedback, and free up time for mentoring, rapport building, and emotional support. To achieve these goals, they should develop digital literacy skills to evaluate, select, and adapt AI tools that align with pedagogical goals and learner needs. They also need to guide learners in responsible AI use, addressing ethical issues such as data privacy, bias, and over-reliance on technology, while fostering a classroom culture that combines technological innovation with empathy, fairness, and inclusivity. Third, school administrators should provide infrastructure and resources that support the effective integration of AI into language education, such as access to adaptive learning systems, training platforms, and digital libraries. Fourth, program developers promote interdisciplinary collaboration among teacher trainers, language teachers, psychologists, researchers, and technologists to design AI-enhanced curricula that align with the PLTA principles. Fifth, policymakers should implement data protection policies and establish guidelines for the responsible and transparent use of AI in educational contexts. They should also design national and international strategies that promote the ethical and equitable use of AI in language learning and teaching. These strategies should include developing standards for data security, transparency, and accountability, as well as ensuring that AI-enhanced language learning and teaching do not deepen inequalities in access to technology. Policies should also support funding for research and innovation at the intersection of AI and the PLTA, encouraging evidence-based practices. Furthermore, they should emphasize the human-centered role of education by ensuring that AI complements rather than replaces teachers, and by reinforcing the importance of the emotional, social, and cultural dimensions in language learning and teaching. As a final recommendation, it is essential to emphasize that the practical implementation of these recommendations depends on pre-service and in-service teacher training programs that equip foreign language teachers with the knowledge and skills to integrate AI into the PLTA in pedagogically sound and ethically responsive ways. To achieve these goals, teacher education programs should incorporate systematic training on AI literacy, ethical awareness, and practical applications of AI-enhanced PLTA. Finally, it is also important to recognize that AI integration may not always be feasible in every educational context. Thus, in low-resource environments, alternatives such as offline mobile applications, preloaded learning modules, or SMS-based nudges can be adopted to maintain access and continuity. These solutions uphold the inclusive spirit of the PLTA by ensuring that personalized and supportive learning opportunities remain available even without advanced technological infrastructure.

8. Recommendations for Researchers

Some recommendations for researchers can also be listed. From the broadest perspective, researchers should conduct studies that consider the effects of AI use on the PLTA regarding linguistic development and well-being. For this purpose, research is warranted to develop measurement tools to validate data about understanding teachers' and learners' perceptions of and attitudes towards using AI in the PLTA, after carrying out qualitative studies for a better and deeper understanding of its usage for learning and teaching experiences. Experimental and mixed-methods studies are also necessary to measure the efficiency of AI-driven tools that explicitly incorporate the PLTA principles, such as fostering positive emotions, supporting relationships, and promoting cultural sensitivity. Moreover, descriptive and correlational studies should be conducted to examine the relationships between AI use in the PLTA and demographic, linguistic, psychological, and environmental factors. Ethical considerations also require systematic investigation, including issues of data privacy, transparency, cultural sensitivity, and algorithmic bias, while studies should examine teacher roles, professional identities, and the training needed to adapt effectively to AI integration into the PLTA. Learner perspectives also warrant attention, focusing on perceived usefulness, ease of use, trust, and potential risks of over-reliance. To achieve these goals, interdisciplinary collaboration among educators, linguists, psychologists, and computer scientists should be provided to evaluate the technical, pedagogical, and psychological dimensions. Finally, researchers should contribute to theory-building by refining and expanding conceptual models of AI-supported PLTA, offering a robust foundation for future inquiry and innovation.

9. Conclusion

This paper proposes a conceptual framework for integrating AI into the PLTA, highlighting its potential to transform foreign language education by bridging human-centered pedagogy with technological innovation. The framework demonstrates that AI is not merely a technical tool but a pedagogical partner that systematically reinforces the principles of the PLTA, particularly by fostering positive emotions, sustaining engagement, strengthening relationships, enhancing meaning, supporting accomplishment, promoting holistic integration, and encouraging cultural sensitivity. By aligning these elements with AI

affordances such as adaptive feedback, intelligent tutoring, affective computing, immersive environments, and predictive analytics, the model provides a structured pathway for designing learning environments that are cognitively effective, socially connected, and emotionally supportive. The integration of AI into the PLTA directly addresses long-standing challenges in foreign language teaching and learning, including foreign language anxiety, lack of motivation, limited opportunities for personalization, and the neglect of affective and relational dimensions. Moreover, the paper emphasizes that successful implementation requires careful pedagogical planning to preserve the balance between human interaction and technological mediation. It also highlights the ethical and practical concerns associated with AI use, including data privacy, transparency, equity, algorithmic bias, and the risk of over-reliance, which must be critically addressed to ensure responsible adoption. The recommendations outlined for learners, teachers, institutions, policymakers, and researchers provide actionable strategies to translate theory into practice while maintaining ethical accountability and inclusivity. Central to the success of these recommendations is the role of pre-service and in-service teacher training programs, which must systematically prepare educators with the skills, knowledge, and ethical awareness to effectively integrate AI into the PLTA. The paper also emphasizes the need for interdisciplinary collaboration, bringing together linguists, educators, psychologists, technologists, and policymakers to design and evaluate AI-enhanced PLT practices. Furthermore, it calls for a sustained research agenda to validate the pedagogical, affective, and cultural dimensions of AI-supported PLT by ensuring both linguistic development and learner well-being. While acknowledging its limitations, the proposed framework provides an innovative and comprehensive approach to re-conceptualizing language education in the digital age. In conclusion, integrating AI into PLT represents not only a pedagogical advancement but also a cultural and ethical responsibility to cultivate resilience, inclusivity, and global citizenship among learners. Thus, it can make foreign language learning more meaningful, enjoyable, and sustainable in increasingly complex educational settings. This vision positions AI-supported PLT as a transformative model capable of guiding the future of language education toward both linguistic excellence and well-being.

Note on Ethical Issues

No ethical committee approval is needed.

Conflict of Interest

The authors have no conflicts of interest to declare.

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