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Scaffold Strategies for Integrating Large Language Models into Production-Oriented Approach Teaching from a Sociocultural Theory Perspective

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Abstract:
With the rapid development of artificial intelligence technology, large language models (LLMs) have demonstrated immense potential in educational applications. This study explores scaffold strategies for integrating LLMs into Production-Oriented Approach (POA) teaching from a sociocultural theory perspective. The research systematically demonstrates the theoretical compatibility between LLMs and sociocultural theory in three aspects: learning tool mediation, Zone of Proximal Development application, and social interactive learning. Building on this foundation, the study examines specific scaffold strategies for LLMs across different stages of POA teaching: in the motivating stage, proposing three key strategies - intelligent situation generation, interactive task design, and real-time capability gap diagnosis; in the enabling stage, constructing a support system comprising intelligent task description, selective learning support, and output practice guidance; in the assessment stage, designing evaluation mechanisms including intelligent assessment criteria construction, multi-dimensional immediate feedback, and portfolio-based evaluation tracking. Finally, the study highlights key considerations for implementation, including balancing cognitive dependency with learning internalization, dynamic adjustment between learning autonomy and support levels, unifying scientific validity and operability in assessment standards, and maintaining equilibrium between technological support and humanistic care.

Keywords:
Sociocultural Theory; Large Language Models; Production-Oriented Approach; Scaffold Strategies; Foreign Language Teaching

1 Introduction

In recent years, the rapid development of artificial intelligence technology has profoundly transformed educational modes and learning approaches. Large Language Models (LLMs), as a significant breakthrough in artificial intelligence, have demonstrated tremendous potential in educational applications. In the field of foreign language teaching, the Production-Oriented Approach (POA) has achieved remarkable success in China's foreign language teaching practice since its inception. This teaching methodology transcends the limitations

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of traditional "learning-centered theory" by emphasizing the concept of "learning-application integration" (Wen, 2016). However, during implementation, teachers commonly report significant challenges in providing personalized and timely scaffold support during the "enabling" phase (Qiu, 2017). Meanwhile, Sociocultural Theory emphasizes that learning occurs through social interaction and highlights the importance of scaffolded instruction (Lantolf, 2017). In this context, integrating LLMs into POA teaching processes, particularly in scaffold strategy design and implementation, holds significant theoretical and practical value. Although current research has begun to examine the application of artificial intelligence technology in foreign language teaching, exploring scaffold strategies for LLMs in POA teaching from a sociocultural theory perspective remains an area requiring deeper investigation.

The core of this research lies in exploring scaffold strategies for LLMs in POA teaching. LLMs, with their powerful natural language processing capabilities, can provide learners with personalized language input, real-time feedback, and interactive support (Brown et al., 2020). In POA teaching practice, scaffold strategies primarily encompass language scaffolds, content scaffolds, and emotional scaffolds (Wen & Bi, 2020). This study will explore how to leverage LLM characteristics to design and implement these scaffold strategies under the guidance of sociocultural theory. This research holds significant theoretical value and practical implications. At the theoretical level, it will enrich the POA theoretical system and deepen understanding of sociocultural theory applications in AI-assisted teaching. At the practical level, research findings will provide teachers with specific, viable teaching strategies to enhance POA teaching effectiveness.

2 Literature review

2.1 Current Research on Production-Oriented Approach

Since its initial proposal by Wen (2015), the Production-Oriented Approach (POA) has attracted widespread attention in foreign language teaching research as a theoretical paradigm aimed at addressing the overemphasis on language input and insufficient form-focused instruction in traditional foreign language teaching. Existing research has primarily focused on two dimensions: theoretical construction and teaching practice.

From a theoretical construction perspective, POA emphasizes "learning for application" as its core concept, highlighting the crucial role of language production in authentic contexts. The approach has established a teaching framework driven by production objectives and centered on enabling production (Wen, 2015). Wen and Sun (2020) further refined this theoretical foundation by proposing a "three-dimensional integration model," which encompasses: setting clear production objectives based on learner needs, promoting alternation between language use and internalization through task-driven activities, and adjusting teaching based on production assessment. This theoretical model effectively addresses the imbalance between input and output in traditional teaching, significantly enhancing learners' comprehensive language application abilities. In-depth analysis reveals that POA has constructed a theoretical system emphasizing the central role of "production" in language learning, not only complementing Task-Based Language Teaching (TBLT) and Input Hypothesis theory but also promoting innovation in foreign language teaching theory (Zhang, 2017).

From an empirical research perspective, POA's practical applications across multiple languages and contexts have demonstrated its broad practical value and adaptability. Yang and Cui (2017) confirmed through

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experimental research in college English teaching that learners using POA showed significantly better performance in writing task completion, vocabulary diversity, and grammatical accuracy compared to traditional teaching methods. Liu's (2019) research on Japanese major students further verified that POA teaching models based on "situational communication tasks" could significantly improve learners' fluency and appropriateness in authentic communication scenarios. However, Guan (2021) found that POA's promotional effects varied among learners of different language proficiency levels: high-level learners achieved more significant progress, while lower-level learners might experience learning difficulties due to excessive cognitive load. This finding suggests that teachers need to adapt task design according to individual learner characteristics to reduce cognitive load and learning anxiety.

2.2 Advances in Sociocultural Theory Research

Sociocultural Theory (SCT) has received sustained attention in second language acquisition research regarding its theoretical implications and practical applications. The theory revolves around three core concepts: internalization, mediation, and the Zone of Proximal Development (ZPD). Internalization explains the mechanism by which individuals transform behaviors and thinking patterns from the social plane to the psychological plane; mediation emphasizes the crucial role of social relationships and material tools in promoting the development of higher mental functions; and ZPD reveals the dynamic characteristics of capability development (Vygotsky,1978).

In recent years, sociocultural theory has experienced significant expansion and deepening of its theoretical content. Lantolf et al. (2019) systematically clarified the theory's philosophical roots, conceptual implications, and disciplinary attributes, establishing a solid theoretical foundation for research in this field. Qin et al. (2021) noted that compared to traditional second language acquisition research's focus on processing individual language units or sentences from a micro perspective, sociocultural theory places greater emphasis on examining how interactive activities comprehensively influence learners' ability to construct linguistic meaning, develop thinking, and enhance cognition within broader sociocultural contexts. Lu (2012), based on Vygotsky's cognitive development theory, provided an in-depth interpretation of language acquisition as a process of internalizing sociocultural characteristics of experience. Notably, Meng Yaru's (2024) detailed analysis of the concept of perezhivanie revealed the dialectical unity between cognition and emotion, individual personality and social environment, providing a new theoretical perspective for understanding the holistic characteristics of language learning.

In the field of second language acquisition, sociocultural theory applications have shown diverse developmental trends. Research has primarily concentrated on three areas: First, dynamic assessment focusing on learners' developmental trajectories during the teaching process; second, concept-based instruction emphasizing the promotion of learners' language ability development through systematic language concepts as mediators. Specifically, regarding language mediation, Shao et al. (2011) revealed through empirical research the mediating role of teachers in college English vocabulary teaching, clarifying teachers' multiple roles as vocabulary material selectors, interpreters, and learning activity organizers. Zhang et al. (2014) applied sociocultural theory to English major writing course reform, with results emphasizing that systematic writing teaching activity design can effectively stimulate coordinated development across linguistic, cognitive, and social dimensions.

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These multidimensional research directions have constructed an interconnected practical research system, providing systematic theoretical guidance and practical support for second language teaching. However, with the rapid development of information technology, AI tools represented by large language models have demonstrated language capabilities comparable to university teachers, showing potential to assume mediating functions in foreign language learning. This technological transformation brings new considerations to the field of foreign language education: how to scientifically integrate intelligent tools like LLMs into teaching practice, how to more precisely identify students' zones of proximal development using technological means, and how to effectively enhance learners' knowledge internalization efficiency. These are crucial issues that foreign language educators urgently need to explore.

3 Theoretical Compatibility Between Large Language Models and Sociocultural Theory

Analyzing the application value and theoretical foundations of large language models in POA teaching from a sociocultural theory perspective holds significant importance. This research systematically demonstrates the inherent compatibility between LLMs and sociocultural theory through the lens of Vygotskian sociocultural theory, providing a theoretical foundation for implementing LLMs in POA teaching.

First, from the perspective of learning tool mediation, LLMs serve as a novel form of cognitive tool and cultural mediator, closely aligning with Vygotsky's core concept of "tool mediation." Vygotsky (1978) posited that higher mental functions develop gradually through the mediating effects of sociocultural tools. In second language acquisition theory, Lantolf (2000) further elaborated on the significance of mediating tools in language learning, arguing that language learners need various symbol systems and cultural tools to reconstruct their cognitive processes. LLMs can function precisely as such novel cognitive tools, offering multidimensional cognitive support through their powerful natural language processing and generation capabilities. For instance, in vocabulary learning, LLMs not only provide word definitions but also help learners establish deeper lexical cognitive frameworks through contextual examples and semantic network associations. This mediating function enables learners to more effectively internalize language knowledge, facilitating the transition from other-regulation to self-regulation.

Second, from the Zone of Proximal Development (ZPD) application perspective, LLMs demonstrate unique pedagogical value. Vygotsky's concept of ZPD emphasizes that effective learning occurs in the zone between learners' current and potential developmental levels. In second language acquisition, Wood et al.'s (1976) scaffolding theory further concretized how to provide effective support within the ZPD. Through their intelligent and personalized characteristics, LLMs can accurately identify learners' language levels and provide appropriate scaffolding support. This support encompasses both correction and guidance at the linguistic form level and suggestions and demonstrations at the pragmatic function level. Particularly in developing productive skills like writing and speaking, LLMs can dynamically adjust support intensity based on learners' specific performance, neither leaving learners feeling lost nor creating excessive dependency.

Finally, from the social interaction and learning dimension, LLMs create a new form of "dialogic learning" space. Sociocultural theory emphasizes the social nature of learning, while in second language acquisition,

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Long's (1981) Interaction Hypothesis further clarifies the facilitative role of meaningful interaction in language acquisition. As highly interactive intelligent systems, LLMs can engage in near-authentic linguistic communication with learners. This interaction differs from traditional teacher-student or peer interaction, offering higher error tolerance and personalization. Learners can freely practice language use and attempt communication in a low-affective-filter environment, receiving immediate, constructive feedback. This novel interaction model maintains the interactive learning essence emphasized in sociocultural theory while transcending the temporal and resource limitations of traditional classrooms.

4 Scaffold Strategies of Large Language Models in POA Teaching

4.1 Motivating Stage

The integration of Large Language Models (LLMs) into the motivating stage of the Production-Oriented Approach aims to optimize the interactivity and personalization of language teaching through intelligent means, helping students clearly identify their current capability gaps and enhance learning motivation. From a sociocultural theory perspective, three core implementation strategies can be identified for LLMs in the POA motivating stage: intelligent situation generation, interactive task design, and real-time capability gap diagnosis.

Intelligent situation generation represents the primary pathway for LLMs to enhance POA teaching. From a sociocultural theory perspective, Vygotsky emphasizes that learning occurs within specific sociocultural contexts through meaningful social interaction and the mediating effects of cultural tools. Long's Interaction Hypothesis (1981) similarly emphasizes the importance of meaningful interaction in promoting language acquisition. Traditional POA classroom teaching often relies on teachers' experiential construction of communicative situations, frequently resulting in scenarios that are disconnected from reality and impractical, significantly affecting students' classroom participation enthusiasm. In contrast, with LLM support, teachers can generate interactive scripts across different cultural backgrounds, including business meetings, negotiations, team collaboration, academic presentations, and daily communication. These scripts encompass not only specific dialogue content but also scene descriptions, role backgrounds, and cultural customs, providing learners with rich sociocultural contextual support.

In practical teaching applications, LLMs can generate differentiated situational tasks according to different course objectives and learner characteristics. For instance, in a business English course, the model can create scenarios for China-US enterprise cooperation negotiations, providing not only negotiation content frameworks but also incorporating cultural difference elements to help students understand and practice cross-cultural business communication. In academic English courses, models can generate science conference reports and academic seminar presentations based on students' different backgrounds in science/engineering or humanities/social sciences, equipped with corresponding professional terminology and expression frameworks. In workplace English courses, models can design hierarchical task scenarios ranging from basic work progress reports to complex cross-cultural team coordination.

Interactive Precision Task Design represents the second crucial strategy for LLMs in supporting POA teaching. The Zone of Proximal Development concept in sociocultural theory indicates that appropriate learn-

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ing scaffolds should be provided between students' current and potential ability levels. Additionally, Krashen's Input Hypothesis (1985) emphasizes that language learning requires comprehensible input material slightly above learners' current level (i+1). In traditional teaching, teachers are constrained by personal experience and cognition, making it difficult to precisely match tasks to students' cognitive development levels and individual differences. LLMs can employ intelligent algorithms to dynamically adjust interactive task difficulty gradients based on students' initial output performance, ensuring task challenging nature while avoiding frustration from excessive advancement.

Specifically, when students complete preliminary output tasks, LLMs can analyze their language usage characteristics, grammatical accuracy, and pragmatic appropriateness based on their age, learning background, and language proficiency, subsequently generating personalized task variants. For lower-performing students, models can provide more language support and structural examples, designing simple, repetitive communicative tasks requiring only basic expressions and simple communicative structures. For advanced students, models can design more complex, variable tasks requiring professional terminology, sophisticated sentence patterns, and deep cultural content. This precise matching not only stimulates learning motivation but also helps students gain communicative practice in near-authentic language environments.

Real-time Capability Gap Diagnosis serves as the third critical strategy in LLM-enhanced language teaching. In traditional teaching modes, teachers often struggle to comprehensively and accurately identify students' language learning bottlenecks in a short time. Through multidimensional analysis of students' initial output, LLMs can quickly locate key language ability shortfalls, providing precise learning objective suggestions and directional guidance. This diagnosis extends beyond surface-level grammatical error identification to encompass pragmatic competence, discourse coherence, and communication strategy dimensions.

For example, models can analyze whether students' language expressions are appropriate in specific contexts, whether language choices are suitable, and whether textual structures are clear. Based on these nuanced diagnostics, students can clearly identify their existing capability gaps, purposefully adjust learning focuses, and develop more targeted learning strategies.

4.2 Enabling Stage

From the perspective of sociocultural theory, the application of Large Language Models (LLMs) in the enabling stage of the Production-Oriented Approach (POA) primarily manifests in three aspects: intelligent task description, selective learning support, and output practice guidance. These strategies both reflect Vygotsky's core sociocultural theoretical premise that learning occurs through social interaction and leverage the technological advantages of LLMs, offering new possibilities for instruction in the enabling stage.

First, the intelligent task description strategy. Vygotsky's sociocultural theory emphasizes that learning is a process of cognitive development mediated by sociocultural tools. Based on this theory, LLMs, as novel cognitive tools, can facilitate learners' understanding of production objectives through precise task descriptions. Additionally, according to Krashen's Affective Filter Hypothesis (1985), reducing learners' emotional anxiety facilitates language acquisition. Therefore, when applying LLMs to describe tasks, a progressive and comprehensible approach can be adopted. Building on these theoretical foundations, LLMs can decompose complex production tasks into several specific, operational subtasks based on learners' language proficiency and cogni-

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tive characteristics, providing clear objective descriptions and completion pathways for each subtask.

In specific teaching practices, LLMs can provide precise support for POA classrooms through intelligent task description strategies. For example, in business English writing courses, when teachers need to assign a "cross-cultural business email writing" task, they can first request the LLM to analyze students' language proficiency and cognitive characteristics, then decompose this comprehensive task into several progressive subtasks: first guiding students to master basic business email formats and courtesy expressions, then learning expression differences across cultural backgrounds, and finally practicing email writing in specific business scenarios. For each subtask, LLMs can provide clear objective statements and assessment criteria, such as "This section focuses on mastering the opening and closing formats of business emails, requiring appropriate salutations and closings based on the recipient's identity." In academic English courses, for tasks like "academic abstract writing," teachers can also request LLMs to break them down into specific steps such as understanding abstract structure, extracting research points, and utilizing academic expressions, providing detailed operational guidelines and examples for each step. This task decomposition and description approach, based on learner characteristics, both reduces learners' cognitive load and ensures task operability and practical value.

Second, the selective learning support strategy. The concept of the "Zone of Proximal Development" (ZPD) in sociocultural theory indicates that effective learning occurs in the zone between learners' current level and potential development level. Based on this, LLMs can recommend the most appropriate learning resources by analyzing learners' existing abilities and potential development space. Furthermore, constructivist learning theory suggests that the learning process needs to establish connections between new knowledge and existing cognitive structures. According to these theories, LLMs can intelligently generate or recommend learning resources across three dimensions—content, language forms, and discourse structures—based on production task requirements and learner characteristics, helping learners effectively extract and internalize these resources through interactive guidance.

In specific teaching practices, LLMs can provide personalized selective learning support for foreign language courses. Taking the "Japanese Oral Communication" course as an example, when teachers assign a situational dialogue task like "asking for directions at a train station," they can first request the model to evaluate students' current Japanese proficiency, including their command of grammatical structures and vocabulary. The model can then recommend differentiated learning resources for students at different levels. For beginning learners, LLMs can prioritize dialogue examples containing basic directional terms and simple honorific expressions, such as " すみません、駅はどこですか " (Excuse me, where is the station?). For intermediate learners, they can generate or recommend materials involving more complex route descriptions and diverse honorific expressions, such as dialogues including transfer instructions and detailed landmark descriptions.

In "Japanese Writing" courses, when students are assigned to write an essay on "Japanese Food Culture," LLMs can recommend learning resources in layers based on students' writing proficiency and understanding of Japanese culture. For students at a basic level, the model can provide food introduction articles containing simple descriptive vocabulary and basic sentence patterns. For advanced students, it can recommend food literature that integrates historical cultural background and in-depth commentary, helping students construct richer writing content frameworks. This resource recommendation strategy based on learner characteristics

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not only ensures the appropriateness of learning materials but also provides students with clear advancement pathways.

Third, the output practice guidance strategy. Sociocultural theory emphasizes the importance of scaffolding in the learning process. It also indicates that such support should be dynamic, progressive, and gradually withdrawn as learner competence increases. Additionally, Swain's Output Hypothesis (2005) posits that language production is not merely a means of demonstrating learning outcomes but also an important mechanism for promoting language acquisition. Furthermore, Ellis's Explicit/Implicit Learning Theory (1994) emphasizes the impact of different types of feedback on language learning. Based on these theories, LLMs can provide dynamically adjusted scaffolding support during output practice, including real-time language correction, expression suggestions, and strategy guidance, adjusting support intensity according to learners' progress.

In specific teaching practices, LLMs can provide comprehensive dynamic support for output practice in foreign language courses. In oral courses, when students need to complete a situational dialogue practice like "ordering at a restaurant," teachers can request LLMs to provide hierarchical guidance based on students' actual performance. In the initial practice stage, LLMs can provide complete dialogue frameworks and key expression prompts, such as various ways to express ordering phrases ("I would like..." / "Please give me...") and politeness variants. As students' proficiency improves, LLMs can gradually reduce direct prompts and instead use guiding questions to inspire students to consider more idiomatic expressions, such as "In this situation, could you use a more indirect expression?" When students have mastered basic dialogue, LLMs can introduce more advanced task requirements, such as handling special dietary needs or service complaints.

The above dynamic enabling strategies based on LLMs break through the limitations of traditional enabling stages, such as heavy teacher cognitive load and insufficient personalized guidance, providing clear task instructions, most appropriate learning resources, and precise feedback guidance in various sub-phases according to students' language abilities. This not only improves the efficiency of output practice but also provides teachers with more flexible and personalized teaching support tools, offering new technical support and theoretical guidance for POA implementation.

4.3 Assessment Stage

Based on sociocultural theory, the application of LLMs in the POA assessment stage primarily manifests in three aspects: intelligent assessment criteria construction, multidimensional immediate evaluation feedback, and portfolio-based assessment tracking.

First, the intelligent assessment criteria construction strategy. Sociocultural theory emphasizes that the formation of assessment criteria should be a process of social interaction and meaning negotiation. Based on this theory, LLMs can serve as cognitive tools to facilitate the joint construction of assessment criteria between teachers and students. Additionally, Black & William's Formative Assessment Theory (2009) indicates that clear assessment criteria help learners' self-monitoring and regulation. Based on these theories, LLMs can generate preliminary assessment criteria frameworks by analyzing teaching objectives, learner characteristics, and task requirements, continuously optimizing and adjusting these criteria through teacher-student discussion to ensure their scientific validity and operability.

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Specifically, in the process of constructing assessment criteria, LLMs can first generate multidimensional evaluation indicators based on the type of production task (such as speaking, writing, translation), including aspects like language accuracy, content completeness, and expression fluency. Then, through feedback from teacher-student interaction, adjust and refine these criteria's expression and scoring details to make them both aligned with teaching objectives and easy for students to understand and implement. For example, for an academic presentation task, the model can design specific scoring criteria from dimensions such as pronunciation and intonation, content organization, and interaction effectiveness, providing clear example illustrations.

Second, the multidimensional immediate evaluation feedback strategy. The "scaffolding" concept in sociocultural theory emphasizes that evaluation feedback should be a dynamic, adaptive support process. Meanwhile, Hattie & Timperley's Feedback Effectiveness Theory (2007) indicates that effective feedback should address three core questions: "Where am I going?", "How am I going?", and "Where to next?" Based on these theories, LLMs can provide timely, multidimensional evaluation feedback during learners' production process.

In specific implementation, LLMs can generate personalized evaluation feedback based on learners' real-time performance. This feedback not only points out problems but, more importantly, provides improvement suggestions and learning strategies. For example, in writing evaluation, LLMs can not only mark language errors but also analyze the causes of errors and provide targeted learning suggestions. For oral production, LLMs can also analyze learners' performance through speech recognition technology and provide immediate feedback.

Third, the portfolio-based assessment tracking strategy. Sociocultural theory posits that learning development is a continuous, spiral-ascending process. Building on this, Gardner's Multiple Intelligences Assessment Theory (1989) emphasizes that assessment should focus on learners' comprehensive development. Furthermore, Stiggins' Authentic Assessment Theory advocates that assessment should reflect authentic learning processes and outcomes. Based on these theories, LLMs can achieve dynamic tracking of learners' production ability development through the establishment of an electronic portfolio system.

In practice, LLMs can automatically collect and organize various learner production outcomes, including oral presentation recordings, written works, and translation pieces, conducting systematic analysis and evaluation. Through data analysis, the model can plot learners' ability development curves, identify their areas of strength and aspects needing improvement, providing long-term developmental recommendations for both teachers and learners.

The above LLM-based assessment strategy system achieves both intelligent and personalized evaluation, significantly reducing teachers' assessment burden while providing timely, comprehensive feedback that helps learners adjust their learning strategies promptly. Moreover, through portfolio-based tracking, it provides data support for learners' long-term development.

5 Key Considerations for Implementing LLMs in POA Teaching

5.1 Balancing Cognitive Dependency and Learning Internalization

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In the process of integrating LLMs into POA teaching practice, teachers need to pay particular attention to students' potential cognitive dependency tendencies. Sociocultural theory emphasizes that learning tools should facilitate rather than replace learners' cognitive development. Therefore, when designing teaching activities, teachers must carefully manage the "degree" of model usage, avoiding excessive dependence on models that might weaken students' independent thinking abilities. Specifically, teachers can adopt a progressive guidance strategy: in the initial stage, allowing students to rely more heavily on LLM assistance; as learning progresses, gradually reducing direct support, increasing classroom teaching challenges, and incorporating more segments requiring students' independent thinking and problem-solving, ensuring students maintain an active cognitive development state. For example, in writing instruction, students may initially reference model-generated exemplars and expression frameworks, but in later stages should be encouraged to construct article structures independently, seeking model assistance only for specific language issues.

Regarding student application, students need to cultivate metacognitive abilities while using LLMs. This includes learning to plan learning objectives, monitor learning processes, and evaluate learning outcomes. By developing these higher-order thinking skills, students can better control their degree of model dependency and achieve true capability internalization. For instance, students can maintain learning journals, recording the purpose, process, and gains from each model usage, continuously optimizing their learning strategies through regular review and summary.

5.2 Dynamic Regulation of Learning Autonomy and Support Level

Teachers need to dynamically adjust the degree of LLM support based on students' actual proficiency levels and learning stages. In the early stages of learning, more model assistance can be provided to help students establish basic capabilities; as student abilities improve, direct support should be gradually reduced while increasing the proportion of autonomous learning. Teachers also need to regularly evaluate the effectiveness of model support, adjusting support strategies promptly to ensure students receive necessary assistance while cultivating independent thinking and problem-solving abilities.

Meanwhile, students should gradually develop awareness and capability for autonomous learning. When using models, they should not remain at the level of simple imitation and application but learn to analyze model-provided suggestions, consider their underlying principles, and gradually form their own learning strategies and methods. Additionally, they should cultivate self-monitoring and assessment abilities, adjusting their model usage methods and degree based on learning outcomes.

5.3 Unifying Scientific Validity and Operability in Assessment Standards

When utilizing LLMs to construct POA outcome assessment systems, teachers need to ensure assessment standards are both theoretically sound and practically operable. Attention should be paid to the comprehensiveness of assessment dimensions, including language accuracy, content completeness, expression fluency, and other aspects, while ensuring these standards can be understood and implemented by students. Teachers should regularly verify the effectiveness of assessment standards, adjusting and optimizing them based on actual teaching outcomes.

Regarding student application, students should deeply understand the implications of assessment standards

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and learn to apply these standards for self-assessment and peer evaluation. When using models for assessment, they should not mechanically apply standards but understand the specific requirements of each assessment dimension, making reasonable judgments based on actual situations. Additionally, they should learn to extract effective information from assessment results to formulate targeted improvement strategies.

5.4 Balancing Technical Support and Humanistic Care

When employing LLMs, teachers need to consistently maintain the humanistic essence of education. Although models can provide efficient technical support, teachers should not overly rely on models to the point of neglecting the emotional dimension of teaching. Teachers should view models as auxiliary tools, providing technical support while establishing emotional connections through direct teacher-student interaction. For example, in the assessment phase, teachers can combine objective model analysis with personalized encouragement and suggestions to help students build learning confidence.

In terms of students' autonomous learning using LLMs, students need to avoid developing excessive psychological dependency. They should understand that models are learning aids rather than substitutes for interpersonal communication. They should learn to actively engage in exchanges with teachers and classmates while using models for technical support, cultivating authentic language communication experiences and emotional cognition.

6 Conclusion

This research examines the scaffolding strategy application of LLMs in POA teaching from a sociocultural theory perspective. The study has thoroughly demonstrated the inherent compatibility between LLMs and sociocultural theory, systematically exploring the scaffolding strategy application of LLMs in POA teaching.

First, the research finds that LLMs, as novel cognitive tools, demonstrate high theoretical compatibility with sociocultural theory in aspects such as tool mediation, zone of proximal development, and social interaction, providing a solid theoretical foundation for their application in language teaching.

Second, this research constructs a complete LLM scaffolding strategy system. For different stages of POA teaching, targeted scaffolding strategies have been designed: emphasizing intelligent situation creation and task design in the motivating stage; focusing on personalization and dynamism of learning support in the enabling stage; and highlighting multidimensional and real-time feedback in the assessment stage. This strategy system maintains POA teaching concepts while fully leveraging LLM technological advantages.

Furthermore, this research clearly identifies key considerations for applying LLMs in POA teaching. The study emphasizes particular attention to issues such as balancing cognitive dependency and capability internalization, dynamic regulation of support levels, scientific validity of assessment standards, providing important guidance for teaching practice.

The theoretical significance of this research lies in enriching the POA theoretical system and deepening understanding of sociocultural theory application in AI-assisted teaching. Its practical significance lies in providing teachers with specific, feasible teaching strategies and operational guidance for LLM application in

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foreign language teaching.

Future research can be deepened in the following aspects: First, conducting empirical research to verify the actual effects of the proposed scaffolding strategies; second, exploring differentiated application strategies for learners at different language proficiency levels; third, researching how to construct more complete assessment systems to achieve scientific evaluation of learning processes and outcomes. These research directions will help further promote the effective application of LLMs in language teaching.

In conclusion, this research provides theoretical frameworks and practical guidance for integrating LLMs into POA teaching, offering important reference value for promoting information technology reform in foreign language teaching. However, we should also recognize that technological tools remain auxiliary means. How to fully leverage technological advantages while maintaining educational essence still requires continuous exploration and practical verification by educators.

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References

[1]Black, P., & Wiliam, D. (2009). Developing the theory of formative assessment. Educational Assessment, Evaluation and Accountability (formerly: Journal of personnel evaluation in education), 21, 5-31.
[2]Ellis, R. (1994). The study of second language acquisition. Oxford, England: Oxford University Press.
[3]Gardner, H., & Hatch, T. (1989). Educational implications of the theory of multiple intelligences. Educational researcher, 18(8), 4-10.
[4]Guan, C. Y., & Guo, W. Q. (2021). A dialectical study on multiple evaluation of English practical writing based on POA in blended teaching environment. Technology Enhanced Foreign Language Education, (02), 30-36+5.

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[5]Hattie, J., & Timperley, H. (2007). The power of feedback. Review of educational research, 77(1), 81-112.
[6]Krashen, S. (1985). The input hypothesis: Issues and complications. London: Longman.
[7]Lantolf, J. P. (2017). Materialist dialectics in Vygotsky's methodological framework: Implications for applied linguistics research. In C. Ratner & D. N. H. Silva (Eds.), Vygotsky and Marx: Toward a Marxist Psychology (pp. 173-189). New York: Routledge.
[8]Lantolf, J. P., & Esteve, O. (2019). Concept-based instruction for concept-based instruction: A model for language teacher education. In M. Sato & S. Loewen (Eds.), Evidence-Based Second Language Pedagogy: A Collection of Instructed Second Language Acquisition Studies (pp. 27-51). New York: Routledge.
[9]Li, C., & Yang, L. X. (2022). A case study of learner agency in academic English reading and writing course from the perspective of sociocultural theory. Modern Foreign Languages, (03), 394-405.
[10]Liu, C. C., & Feng, Y. J. (2019). Teaching practice of "Japanese interpretation" course based on Production-Oriented Approach. Frontiers of Foreign Language Education Research, (04), 63-69+93.
[11]Long, M. H. (1981). Input, interaction, and second language acquisition. Annals of the New York Academy of Sciences, 379, 259-278.
[12]Lu, M. (2012). Research on language acquisition based on sociocultural theory. Academic Forum, (08), 205-209.
[13]Meng, Y. R., Zhang, Y. H., & Xi, J. (2024). Analysis of the concept of perezhivanie in sociocultural theory: Exploring the path of holistic view in foreign language education. Theory and Practice of Foreign Language Teaching, (02), 11-19.
[14]Nizzolino, S. (2024). Artificial Intelligence in Language Teaching: Using ChatGPT to assist teachers of English as a Foreign Language.re-Open Journal per la formazione in rete, 24(1), 242-261.
[15]Qin, L. L., Ouyang, X. B., & He, Y. H. (2021). A study on learners' internalization of content knowledge and language knowledge in Content and Language Integrated Learning model: From the perspective of language expression in sociocultural theory. Foreign Languages in China, (01), 81-90.
[16]Qiu, L. (2017). A study on the process-based design of enabling in Production-Oriented Approach. Modern Foreign Languages, (03), 386-396+439.
[17]Shao, Q. Y., & Feng, L. (2011). On teachers' mediating role in college English vocabulary teaching from the perspective of sociocultural theory. Journal of Beijing Jiaotong University (Social Sciences Edition), (04), 105-109.
[18]Swain, M. (2005). The output hypothesis: Theory and research. In E. Hinkel (Ed.), Handbook of research in second language learning and teaching. Mahwah, NJ: Lawrence Erlbaum.
[19]Wang, L. L., & Qin, L. L. (2022). The impact of supervisor feedback on academic discourse structure acquisition from the perspective of sociocultural theory: A case study of translation major graduation thesis. Journal of PLA Foreign Languages Institute, (01), 103-110.
[20]Wen, Q. F. (2015). Construction of the Production-Oriented Approach theoretical system. Foreign Language Teaching and Research, (04), 547-558+640.
[21]Wen, Q. F., & Bi, Z. (2020). A comparative analysis of Production-Oriented Approach and Task-Based Language Teaching. Foreign Language Teaching, (04), 41-46.
[22]Wen, Q. F., & Sun, S. G. (2020). Analysis of driving scenario design elements in Production-Oriented Approach. Frontiers of Foreign Language Education Research, (02), 4-11+90.
[23]Wood, D., Bruner, J. S., & Ross, G. (1976). The role of tutoring in problem solving. Journal of Child Psy-

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chology & Psychiatry, 17(2), 89-100.
[24]Yang, Y. P., & Cui, Z. H. (2016). Research on college English classroom teaching model in applied technology undergraduate institutions: A case study of Ordos Institute of Applied Technology. Vocational and Technical Education, (35), 47-50.
[25]Zhang, L., & Sun, Y. Z. (2014). English major writing course reform practice based on sociocultural theory perspective. Foreign Language World, (05), 2-10.
[26]Zhang, L. L. (2017). A study on the teaching effectiveness of Production-Oriented Approach. Modern Foreign Languages, (03), 369-376+438.

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