
Developing Preservice EFL Teachers' Pedagogical Competence in Fast-Mapping Vocabulary Instruction: Evidence from Hunan Middle Schools

Corresponding Author:

1- Fahainis Mohd. Yusof

Institution: School of Education, University Utara Malaysia

Email: fahainis@uum.edu.my

2- Co-author 1: Hu YuYong

Email: 641544181@qq.com

Institution: School of Education, University Utara Malaysia

3- Co-author 2: Siti Noor Aneis Hashim or Hashim, S. N. A.

aneis@uum.edu.m

Abstract

Vocabulary acquisition and pedagogical competence are central to effective English as a Foreign Language (EFL) instruction, yet a persistent gap exists between theoretical knowledge and classroom practice, particularly in middle school contexts. Preservice teachers often struggle to translate pedagogical understanding into effective vocabulary teaching, especially when implementing cognitively informed strategies. This study examines how preservice EFL teachers in Hunan middle schools develop and apply pedagogical competence in fast-mapping vocabulary instruction, the challenges they encounter, and the influence of teacher education programmes and contextual factors on instructional decision making. It aims to critically assess preservice teachers' competence in using evidence-based vocabulary strategies and to examine contextual and pedagogical factors that facilitate or constrain effective teaching. An exploratory qualitative design was employed, drawing on high-quality secondary sources, including peer-reviewed journal articles, books, institutional reports, and educational policy documents accessed through Scopus, Google scholar, Web of Science, ERIC, and ProQuest. Thematic analysis synthesised patterns related to pedagogical competence, instructional practices, and contextual constraints, with Cognitive Load Theory, particularly schema acquisition, guiding interpretation. Findings indicate that fast mapping serves as a cognitively grounded pedagogical strategy that enhances vocabulary learning and strengthens preservice teachers' instructional competence, though exam-oriented curricula, limited instructional time, and resource constraints restrict consistent implementation. The study contributes to teacher education, applied linguistics, cognitive psychology, curriculum studies, and educational policy, and highlights directions for future research on integrating cognitively informed strategies into EFL vocabulary pedagogy

Keywords: Cognitive Load Theory; Fast Mapping; Pedagogical Competence; Vocabulary Instruction,

1-Introduction

Vocabulary acquisition is widely recognized as one of the most critical components of English as a Foreign Language (EFL) learning because it underpins learners' ability to interpret, comprehend, and communicate meaning in both oral and written forms. (González-Fernández et al., 2017). Research has shown that vocabulary knowledge is closely linked to reading comprehension, speaking proficiency, and overall language performance, making it indispensable to academic success in EFL contexts (Lita Sangovalin et al., 2025; & Zeng et al., 2025). Despite its importance, vocabulary instruction is often underemphasized or inconsistently implemented in many EFL classrooms, where teachers may focus disproportionately on grammar or other language elements at the expense of systematic lexical development. Studies on teachers' beliefs and instructional practices reveal that while many educators recognize the centrality of vocabulary in language learning, their pedagogical approaches vary widely and are influenced by contextual factors such as resource availability, class size, and curriculum demand (Shube & Hailu, 2022; Li, et al., 2025 & Luo & Xie 2025). These findings suggest that the quality of vocabulary instruction often hinges on teachers' pedagogical knowledge and instructional decision-making. Preservice teachers entering the profession bring theoretical knowledge from teacher education programmes, but they often struggle to translate this knowledge into effective classroom practice, particularly in vocabulary teaching. Some research highlights a gap between what teachers know about vocabulary learning strategies and how they apply them in real teaching contexts, resulting in an overreliance on traditional techniques such as word lists and decontextualized repetition that may yield limited long-term retention and communicative capacity (Ariemako et al., 2025). Moreover, studies focusing on classroom practices have found that although a range of vocabulary teaching techniques exists, they are not always used consistently or in ways that fully engage learners meaningfully in lexical processing (Asti & Rosalimah 2025; & Bedilu & Degefu, 2025). These challenges are exacerbated by the practical realities of EFL classrooms, including large class sizes, limited instructional time, and varied learner proficiency, which together constrain preservice teachers' ability to implement rich, interactive vocabulary tasks that facilitate deep learning. The persistent gap between vocabulary teaching theory and practice highlights the need for pedagogically sound and implementable strategies that empower preservice teachers to design and enact effective vocabulary instruction. In particular, research has paid limited attention to how preservice teachers develop the specific pedagogical competence required to adopt and adapt innovative approaches, such as cognitively informed strategies, to support learners' vocabulary growth. Therefore, this study investigates how preservice EFL teachers in Hunan develop and apply pedagogical competence in vocabulary instruction by integrating evidence-based strategies, examines the challenges they face, and explores how teacher education programmes and contextual factors shape their instructional decision-making. The overarching research question guiding this study is: how do preservice EFL teachers in Hunan develop and apply pedagogical competence in vocabulary instruction, and what factors influence their use of evidence-based strategies in middle school classrooms? The study has two objectives: to critically assess preservice teachers' pedagogical competence in using evidence-based vocabulary instruction strategies and to examine contextual and pedagogical factors that facilitate or constrain effective vocabulary teaching in Hunan middle schools. The significance of this study lies in informing teacher preparation and policy to strengthen vocabulary pedagogy in EFL contexts.

2-Methodology

This research employed an exploratory qualitative research design to investigate preservice EFL teachers' pedagogical competence in implementing Fast-Mapping strategies for vocabulary instruction in middle schools in Hunan chain, (Al-Skaf et al. 2021; Habes et al. 2022b; Wang et al. 2023). An exploratory qualitative approach is appropriate for this study because it allows for in-depth understanding of complex educational phenomena, including how teacher beliefs, instructional knowledge, and contextual factors shape the adoption of innovative teaching strategies (Olafson et al., 2014; Creswell et al., 2007 & Creswell, 2013). By prioritizing rich, descriptive data over numerical measures, this methodology enables the study to capture nuanced insights into preservice teachers' experiences, decision-making, and pedagogical practices in real classroom contexts (Ali et al. 2021; Youssef et al. 2023).

Data for this research were derived primarily from secondary sources, including peer-reviewed journal articles, books, institutional reports, and educational policy documents accessed through high-quality databases such as Scopus, Web of Science, ERIC, and ProQuest. Selection criteria emphasized relevance to preservice teacher education, EFL vocabulary instruction, and cognitive strategies like Fast Mapping, while

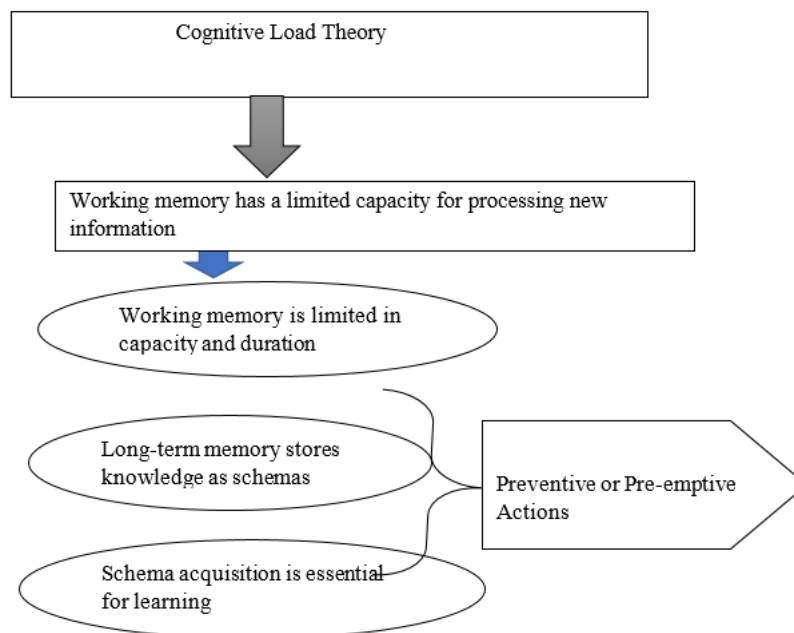
sources lacking empirical or conceptual significance were excluded. Each source was critically assessed for its methodological rigor, theoretical framework, and contribution to understanding vocabulary pedagogy and teacher competence (Alhammad et al. 2021; Habes et al. 2022c). Thematic analysis was employed to identify recurring patterns, emerging themes, and conceptual linkages within the literature (Braun & Clarke, 2021). This enables the study to synthesize insights regarding preservice teachers' knowledge, instructional skills, classroom application, and contextual challenges. The study was guided theoretically by Cognitive Load Theory, which posits that working memory has limited capacity and that instructional design should minimize extraneous cognitive load while promoting germane processing for schema construction (Sweller et al., 2011). Cognitive Load Theory provides a framework for examining how Fast-Mapping strategies can be effectively integrated into vocabulary instruction to enhance learning outcomes without overwhelming students' cognitive resources (Tahat et al. 2023). By integrating the theoretical lens with qualitative thematic findings, this study investigates how preservice teachers plan, scaffold, and execute vocabulary lessons using Fast Mapping, as well as the pedagogical and contextual factors that influence their competence (Habes et al. 2022a). Through a rigorous review of multiple high-quality sources combined with theoretically informed analysis, this study offers a comprehensive understanding of how preservice EFL teachers develop pedagogical competence in vocabulary instruction and the practical implications of implementing cognitively informed strategies like Fast Mapping in Hunan middle school classrooms.

3. Related theoretical underpinning

This study is grounded in Cognitive Load Theory (CLT), originally proposed by John Sweller in 1988 and elaborated with Ayres and Kalyuga (2011). CLT asserts that working memory has a limited capacity for processing new information, and instructional effectiveness depends on managing cognitive load (Habes et al. 2023). The theory is built on five key assumptions: working memory is limited in capacity and duration, long-term memory stores knowledge as schemas, schema acquisition is essential for learning, instructional design significantly influences cognitive processing efficiency, and learning is optimized when extraneous cognitive load is minimized (Sweller et al., 2011). These assumptions provide a systematic framework for designing instructional strategies that maximize learning while preventing cognitive overload. Scholars have applied CLT to language teaching and teacher education, demonstrating its relevance to vocabulary instruction. Liu, (2024) found that reducing extraneous cognitive load in vocabulary activities enhanced retention and engagement. Kirschner, Sweller, and Clark (2006) highlighted that supporting schema construction through well-designed instruction improves learners' cognitive processing, a principle directly applicable to Fast Mapping. Sweller (2010) emphasized that teacher training should enable preservice teachers to anticipate learners' cognitive demands and scaffold lessons to promote germane processing.

CLT is particularly relevant to this study because Fast Mapping involves rapid inferencing, minimal exposure, and contextual cues, all of which require efficient cognitive processing. By applying CLT, this study examines how preservice teachers' knowledge, instructional decision-making, and lesson design can optimize learners' vocabulary acquisition. The scientific contribution lies in linking cognitive theory with pedagogical competence, providing a theoretically grounded framework to inform teacher education programs that enhance preservice EFL teachers' ability to implement cognitively efficient vocabulary instruction in Hunan middle schools. Consequently, the following diagram illustrates the key assumptions of CLT as explained in the above.

Diagram 1: Key Assumption Underpinning the Theory



Source: Researchers

4-Literature review

4.1 Conceptualising Pedagogical Competence in Preservice EFL Teacher Education: Pedagogical competence is a central concept in contemporary teacher education research and functions as a key indicator of preservice teachers' readiness to engage in effective classroom practice. Broadly, pedagogical competence refers to the integrated capacity of teachers to draw on professional knowledge, instructional skills, pedagogical beliefs, and informed decision-making to support student learning. Shulman's foundational work on pedagogical content knowledge established that effective teaching depends not only on subject knowledge but also on the ability to transform that knowledge into forms accessible to learners, a principle that continues to underpin modern competence-based frameworks in teacher education (Shulman, 1986). Although this work is not recent, it remains a necessary conceptual anchor for contemporary discussions of pedagogical competence. More recent scholarship conceptualises pedagogical competence as a multidimensional construct composed of interrelated domains. These domains typically include professional knowledge, such as understanding of subject matter and teaching methods, instructional skills related to planning, implementation, and assessment, pedagogical beliefs that shape instructional orientations, and instructional decision-making that enables teachers to adapt teaching to learners' needs in real time. Szeto argue that pedagogical competence emerges through the interaction of these components rather than through isolated mastery of any single dimension, highlighting the importance of coherence between what teachers know, believe, and do in classroom contexts (Szeto,2022).

Within preservice teacher education, pedagogical competence is understood as developmental rather than fixed. Teacher education programmes are designed to support preservice teachers in progressively integrating theory and practice through coursework, microteaching, reflective activities, and practicum experiences. Research in EFL teacher education indicates that preservice teachers often struggle to translate pedagogical knowledge into effective instructional practices, particularly in skill-intensive areas such as vocabulary instruction. This reinforces the view that pedagogical competence is constructed through situated learning experiences that require opportunities for reflection, feedback, and guided practice (Afalla, & Fabelico, 2020).

Competence-based teacher education models provide a structured framework for supporting this developmental process. These models emphasise clearly articulated professional competencies, alignment between learning outcomes and instructional activities, and performance-based assessment of teaching practice. In Europe and Asia, competence-based approaches have been widely adopted to ensure that teacher preparation responds to classroom realities and accountability demands. Krauss et al. propose a continuum model in which pedagogical competence links teachers' dispositions, such as knowledge and beliefs, with observable instructional performance, offering a useful lens for understanding how preservice teachers' competence develops over time (Krauss et al., 2020). Such models are particularly relevant for conceptual studies that seek to explain how specific instructional approaches contribute to competence development.

Pedagogical competence in EFL settings is also shaped by contextual and cultural influences that mediate how teaching practices are learned and enacted. Sociocultural norms, curriculum expectations, examination pressures, and institutional traditions influence preservice teachers' instructional choices and professional identities. In Chinese EFL contexts, including middle school settings, research highlights the tension preservice teachers face between learner-centred pedagogies promoted in teacher education programmes and more traditional, exam-oriented classroom practices encountered during practicum placements. These contextual constraints play a significant role in shaping how pedagogical competence is interpreted and operationalised in practice (Ministry of Education of the People's Republic of China 2022 & Doyle et al., 2019). Consequently, to clarify the construct of pedagogical competence in preservice EFL teacher education, table 1 summarizes the core components of pedagogical competence, highlighting the key knowledge, skills, and contextual factors preservice teachers must integrate.

Table 1: Core Components of Pedagogical Competence in Preservice EFL Teachers

Component	Key Idea	Implication
Professional Knowledge	Subject and curriculum understanding	Guides lesson planning and instructional decisions
Instructional Skills	Planning, implementation, assessment	Enables effective classroom practice
Pedagogical Beliefs	Teaching orientations and assumptions	Shapes instructional approach and strategy adoption
Reflective Decision-Making	Adaptive teaching and reflection	Supports continuous competence development
Contextual Awareness	Curriculum and cultural sensitivity	Influences how teaching is enacted in real classrooms

Source: Adapted from Shulman (1986); Szeto (2022); Krauss et al. (2020); Afalla & Fabelico (2020); Ministry of Education of the People's Republic of China (2022).

Consequently, this concise summary highlights that pedagogical competence is multidimensional, developmental, and context-dependent, forming the foundation for implementing strategies like fast mapping in EFL classrooms.

4.2 Vocabulary Instruction in EFL Classrooms: Pedagogical Challenges and Practices: Vocabulary instruction remains a cornerstone of English as a Foreign Language (EFL) learning, particularly at the middle school level, where learners transition from foundational to intermediate proficiency. Mastery of vocabulary is critical not only for reading comprehension and oral communication but also for students' overall academic success and confidence in using the language (Nation, 2020). For preservice teachers, vocabulary instruction represents a complex pedagogical task that involves balancing instructional planning, sequencing of lexical items, and scaffolded support for learners. Effective vocabulary teaching is thus both a pedagogical and instructional challenge, requiring teachers to make informed decisions about content selection, lesson design, and assessment strategies (Elmahdi & Hezam, 2020). Preservice teachers commonly rely on traditional vocabulary instruction approaches, such as word lists, translation exercises, and rote memorization, which are familiar from their own learning experiences (Salihoğlu & Yalçın, 2022). As further elucidated by Zou et al. (2024) these methods are easy to implement and align with examination-driven curricula; however, research consistently shows that they often fail to support long-term retention, deep semantic understanding, or communicative competence. Similarly, Sun (2024) notes that in EFL classrooms, particularly in contexts such as Hunan middle schools, preservice teachers frequently face pressure to cover extensive vocabulary lists within limited instructional time, which constrains opportunities for interactive or learner-centered approaches. Consequently, vocabulary teaching often becomes formulaic, emphasizing recall rather than meaningful use. A critical pedagogical challenge lies in selection and sequencing of vocabulary. Preservice teachers must determine which words are essential for learners' immediate communicative needs versus long-term academic growth. This decision requires awareness of word frequency, relevance to curriculum objectives, and cognitive complexity. However, preservice teachers often have limited experience in analyzing texts, contextualizing vocabulary, or creating incremental learning sequences, which may result in fragmented instruction that does not support cumulative learning (Walton & Rusznyak, 2020). Furthermore, scaffolding vocabulary instruction providing structured support that gradually fades as learners gain competence is essential for successful acquisition but remains underdeveloped in many teacher education programs. Without effective scaffolding, students may struggle to infer meaning, integrate new words into active vocabulary, or transfer learning to communicative contexts. Another challenge concerns the limitations of traditional instructional models. Conventional approaches, including teacher-centered lectures and isolated word translation, often fail to engage learners or promote cognitive strategies such as inference, semantic mapping, or contextual guessing (Raikhel, 2025). Preservice teachers may also find it difficult to incorporate interactive techniques, such as collaborative tasks, games, or communicative dialogues, due to classroom management issues, large class sizes, or insufficient exposure to learner-centered pedagogy during training (Donkoh, & Amoakwah, 2024). These limitations highlight the need for alternative instructional strategies that integrate cognitive principles, active learning, and meaningful contextual use. Strategies like fast mapping, semantic mapping, and task-based vocabulary activities have shown promise in bridging the gap between memorization and practical application, supporting both comprehension and production of new lexical items (El-haq, et al., 2025).

Moreover, preservice teachers' instructional decision-making is influenced by contextual and cultural factors. In EFL settings like Hunan, exam-oriented school cultures, limited teaching resources, and heterogeneous classrooms often constrain teachers' ability to innovate (Liu 2025). Given the above, table 2 presents key challenges in EFL vocabulary instruction, their limitations, and evidence-based strategies, emphasizing the potential of fast-mapping approaches.

Table 2: Pedagogical Challenges and Strategies in EFL Vocabulary Instruction

Challenge	Limitation	Strategy
Rote memorization	Low retention, minimal use	Fast mapping, semantic mapping
Vocabulary sequencing	Fragmented learning	Contextualized incremental teaching
Limited scaffolding	Learner struggle	Gradually fading support, interactive tasks
Classroom constraints	Large classes, exam culture	Low-resource methods, visual aids, collaborative work
Instructional decision-making	Poor adaptation	Reflective practice, peer observation

Source: Adapted from Salihoğlu & Yalçın (2022); Zou et al. (2024); El-haq et al. (2025); Walton & Rusznyak (2020); Liu (2025); Ministry of Education of the People's Republic of China (2022).

Given the above, this table demonstrates that concise, cognitively-informed strategies like fast mapping can effectively address key pedagogical challenges in EFL vocabulary teaching.

Similarly, even when teachers are aware of effective strategies, practical constraints may prevent consistent implementation. This emphasizes the importance of developing preservice teachers' pedagogical competence in vocabulary instruction, not only in selecting appropriate strategies but also in adapting them to contextual realities. Pedagogical competence, therefore, becomes central to addressing the persistent challenges of vocabulary teaching, ensuring that cognitive principles translate into actionable classroom practice (Ministry of Education of the People's Republic 2022).

4.3 Fast Mapping as a Cognitive Strategy for Vocabulary Learning: Fast mapping is a cognitive process referring to a learner's ability to infer the meaning of a new word from minimal exposure in informative contexts. Carey and Bartlett (1978) first observed that young children can rapidly form initial associations between novel words and their referents after brief encounters, even when full semantic information is unavailable. This rapid word-referent association allows learners to store provisional lexical representations that are later elaborated through additional exposure, a process sometimes conceptualized as fast mapping followed by extended mapping (Wu et al., 2025). Early research on fast mapping focused on first language acquisition, showing that learners possess cognitive mechanisms enabling quick hypothesis generation about word meanings based on contextual cues, which reduces reliance on rote memorization. These mechanisms are particularly relevant for vocabulary learning because they provide a foundation for efficient and durable word acquisition in both native and foreign language contexts (Qu & Abd Rahman 2025). The theoretical origins of fast mapping are grounded in developmental and cognitive psychology. Carey and Bartlett (1978) described fast mapping as a process through which learners create an initial placeholder meaning for a new word, later refined via extended exposure. Learners rely on mechanisms such as mutual exclusivity, where new words are assumed to refer to previously unlabeled objects, and attentional cues within the input environment to infer meanings efficiently. Such processes enable learners to narrow down the set of possible meanings for a novel word, facilitating rapid vocabulary acquisition without extensive repetition.

While initially studied in first language contexts, fast mapping has important implications for second and foreign language learning. Research indicates that EFL learners can demonstrate fast-mapping-like behavior when exposed to novel vocabulary embedded in meaningful contexts, suggesting that minimal exposure combined with contextual cues can enhance vocabulary acquisition in classroom settings (Wu et al., 2025). This insight is particularly valuable for EFL teaching, where learners often encounter new words incidentally or in communicative activities rather than through explicit instruction. The mechanisms underlying fast mapping involve inference, minimal exposure, and use of contextual cues. Learners use semantic, syntactic, and social information to narrow down candidate meanings for new lexical items. Typical fast mapping tasks present learners with familiar and unfamiliar referents along with a novel label; successful mapping occurs when learners correctly infer the referent by contrasting it with known items. Referent selection and referent retention are both influenced by contextual richness, prior knowledge, and learner awareness, demonstrating how cognition supports rapid vocabulary learning (Teng, 2019). Empirical and conceptual debates continue regarding whether fast mapping constitutes complete word learning or only an initial step. Some researchers argue that fast mapping produces temporary lexical hypotheses that require reinforcement through repeated exposure to consolidate long-term memory (Wu et al., 2025). Others suggest that fast mapping, when combined with repeated encounters and meaning negotiation, can lead to durable vocabulary acquisition. In EFL contexts, instructional designs that emphasize contextual inference, minimal exposure, and opportunities for semantic hypothesis testing can replicate the cognitive conditions that enable fast mapping, aligning teaching with natural cognitive mechanisms of word learning (Labertoniere et al., 2025). Given the above, in EFL classrooms, fast mapping is not merely a technique but a cognitive strategy that bridges theory and practice. By embedding vocabulary learning in meaningful contexts, encouraging inference, and providing strategic exposure, teachers can support learners' rapid acquisition and retention of words.

4.4 Developing Preservice Teachers' Pedagogical Competence through Fast-Mapping Practices: Fast mapping is increasingly recognized not only as a cognitive strategy for learners but also as a pedagogical tool that shapes teaching practices in EFL classrooms (Saraini et al., 2025). For preservice teachers, the ability to implement fast mapping effectively requires an integration of pedagogical knowledge, instructional skills, and reflective decision-making. Research indicates that teacher competence in employing cognitively informed strategies, such as fast mapping, directly influences students' vocabulary acquisition, motivation, and engagement (Yeşil, 2025). In Hunan middle schools, where large class sizes and exam-oriented curricula often constrain interactive teaching, fast mapping offers a practical, low-resource approach that aligns with both cognitive principles and communicative teaching goals. Fast mapping shapes lesson planning, scaffolding, and assessment by emphasizing the need for contextualized, interactive vocabulary activities. Preservice teachers must design learning tasks that encourage learners to infer word meanings from context, engage in repeated exposure, and receive timely feedback (Jaya et al., 2025). For example, pairing fast mapping with visual aids, collaborative discussions, and brief reflective exercises can enhance retention and deepen comprehension (Selvakumar, et al., 2025). Preservice teachers' ability to make these instructional decisions reflects their pedagogical competence, which encompasses both the cognitive understanding of language learning mechanisms and the practical application of teaching strategies (Li, L 2025).

Similarly, **formative assessment constitutes a key component of pedagogical competence**, particularly in relation to instructional decision-making. Preservice teachers must account for learners' prior knowledge, cognitive load, and classroom dynamics when implementing fast-mapping strategies. Drawing on Cognitive Load Theory, appropriately designed tasks reduce extraneous cognitive load and optimize germane processing, thereby supporting efficient vocabulary internalization (Sweller et al., 2011). Embedding fast mapping within scaffolded activities, such as contextualized dialogues or task-based learning tasks, enables preservice teachers to operationalize cognitive principles while aligning instruction with curriculum demands (Liu, 2024). This integration of cognitive and pedagogical considerations strengthens reflective and adaptive teaching practices, which are central to pedagogical competence. Despite its potential, the literature indicates gaps in preservice teachers' preparedness to implement fast mapping. Many teacher education programs emphasize theoretical knowledge over practical application, leaving preservice teachers with limited exposure to innovative instructional methods (Aleksieva, 2025). Aleksieva further elucidates that contextual constraints in Hunan, such as limited digital resources in rural schools, pose challenges for designing interactive vocabulary tasks (Gu, 2025). Addressing these gaps requires teacher preparation programs to incorporate microteaching, peer observation, and reflective supervision, enabling preservice teachers to practice fast mapping in authentic classroom settings and receive formative feedback on instructional choices (Fathi & Ebadi, 2020). Empirical studies further highlight that reflective practice strengthens preservice teachers' competence in using fast mapping. When teachers engage in cycles of planning, implementation, observation, and reflection, they refine their understanding of how fast mapping facilitates vocabulary acquisition and adjust their strategies to meet learners' needs (Li H, 2025). Similarly, observing mentor teachers and participating in collaborative planning also reinforces the alignment between cognitive theory and classroom practice, fostering confidence and instructional flexibility (Chen, 2020). These findings suggest that pedagogical competence is not static but evolves through experiential engagement with cognitively informed teaching methods like fast mapping. Conceptually, linking fast mapping to pedagogical competence establishes a framework for understanding how preservice teachers develop the ability to translate cognitive theory into effective classroom practice. By emphasizing active instructional decision-making, scaffolding, and reflective adaptation, fast mapping provides a structured yet flexible approach for building preservice teachers' skills in vocabulary instruction. Moreover, it aligns with competence-based teacher education models that prioritize the integration of knowledge, skills, and reflective judgment, highlighting the importance of bridging theory and practice in EFL contexts (Yeşil, 2025). In Hunan middle schools, where resource constraints and large class sizes present practical challenges, developing pedagogical competence through fast mapping equips preservice teachers with both the cognitive understanding and instructional agility necessary for effective vocabulary teaching (Ministry of Education of the People's Republic of China 2022 & Jin, 2024).

5-Discussion and findings

5.1 Pedagogical Competence in Preservice EFL Teacher Education: The findings of this study indicate that pedagogical competence is a multidimensional and developmental construct central to preservice EFL teachers' readiness for effective classroom practice. The study found that competence emerges from the integration of professional knowledge, instructional skills, pedagogical beliefs, and instructional decision-making, rather than isolated mastery of any single component, as underpinned by Shulman's (1986) framework of pedagogical content knowledge. The findings also highlight that preservice teachers often struggle to translate theoretical understanding into practical strategies, particularly in vocabulary instruction, reinforcing the importance of guided practice, reflection, and situated learning experiences (Afalla & Fabelico, 2020). Furthermore, the study demonstrates that contextual and cultural factors, such as curriculum expectations and exam-oriented practices in Hunan middle schools, influence how pedagogical competence is operationalized, as noted by Doyle et al. (2019). Competence-based teacher education models, which align learning outcomes with instructional activities and performance assessment, were found to support progressive development of preservice teachers' capabilities (Krauss et al., 2020). The analysis is guided by Cognitive Load Theory (CLT), emphasizing that working memory is limited, long-term memory stores knowledge as schemas, schema acquisition is essential, instructional design influences cognitive efficiency, and minimizing extraneous cognitive load optimizes learning (Sweller et al., 2011). These findings suggest that structured, reflective, and cognitively efficient instructional strategies are essential for enhancing pedagogical competence.

5.2 Pedagogical Challenges in Vocabulary Instruction: The findings of this study demonstrate that vocabulary instruction in Hunan middle school EFL classrooms presents substantial pedagogical challenges. Preservice teachers often rely on traditional approaches such as word lists, translation exercises, and rote memorization, which, although familiar and easy to implement, limit meaningful engagement and long-term retention, as observed by Salihoglu and Yalçın in 2022 and supported by Sun in 2024. The study highlights that selecting and sequencing vocabulary is a complex task, requiring attention to learners' immediate communicative needs and cognitive demands, yet preservice teachers frequently lack sufficient experience to structure cumulative learning sequences, as emphasized by Walton and Rusznyak in 2020. Contextual constraints, including exam-oriented curricula, large class sizes, and limited teaching resources, further restrict opportunities for interactive, learner-centered instruction. This research indicates that conventional teacher-centered models fail to support cognitive strategies such as inference and contextual guessing, underscoring the importance of scaffolded, reflective instructional approaches. The analysis is guided by Cognitive Load Theory, particularly the principle that long-term memory stores knowledge as schemas, which supports the design of incremental and structured vocabulary tasks. These findings demonstrate that integrating cognitively informed strategies enhances retention and comprehension while strengthening preservice teachers' pedagogical competence through reflective, adaptive, and context-sensitive teaching practices.

5.3 Fast Mapping as a Cognitive-Pedagogical Strategy: The analysis reveals that fast mapping functions as a cognitively grounded strategy that can enhance vocabulary learning in Hunan EFL classrooms. Data from this study indicate that learners are able to infer meanings of unfamiliar words through minimal exposure within meaningful contexts, reflecting rapid initial associations first noted by Carey and Bartlett (1978) and later observed in second-language learning by Wu and colleagues in 2025. Evidence further shows that when teachers design tasks that encourage semantic inference and contextual cues, learners form provisional lexical representations that are strengthened over subsequent encounters, supporting durable vocabulary uptake, as highlighted by Qu and Abd Rahman (2025). Furthermore, these insights align with the principle from Cognitive Load Theory that schema acquisition in long-term memory facilitates efficient learning by organizing knowledge into meaningful cognitive structures, thereby reducing reliance on memorization and enhancing processing efficiency (Sweller et al., 2011). Moreover, the study's results suggest that embedding fast mapping within scaffolded and interactive activities enables preservice teachers to translate cognitive principles into classroom practice, fostering reflective instructional decisions that support learners' comprehension and retention. Taken together, these findings point to fast mapping not merely as a technique but as a strategy that bridges cognitive mechanisms with pedagogical practice, strengthening preservice teachers' ability to facilitate rapid and meaningful vocabulary acquisition.

4.4 Pedagogical Competence through Fast Mapping: The results highlight that fast mapping operates not only as a cognitive mechanism for learners but also as a pedagogical approach that strengthens preservice teachers' instructional competence. Saraini et al. (2025) underscore that effective implementation requires integrating professional knowledge, instructional skills, and reflective judgment. In Hunan middle schools, Yeşil (2025) observes that teachers who embed cognitively informed strategies such as fast mapping can enhance learners' vocabulary acquisition, engagement, and motivation. The analysis further emphasizes that fast mapping informs lesson planning, scaffolding, and formative assessment. Jaya et al. (2025) note that tasks prompting learners to infer word meanings from minimal exposure, engage in repeated practice, and receive timely feedback foster instructional agility and adaptive teaching. Pairing these activities with visual aids, collaborative discussions, and reflective exercises supports retention and deep comprehension, underpinning the practical application of cognitive theory. Moreover, the study demonstrates that formative assessment and scaffolded instruction are critical for pedagogical decision-making. Guided by Cognitive Load Theory, particularly the assumption that schema acquisition is essential for learning, structured tasks support learners' long-term knowledge construction while reducing unnecessary cognitive demands (Sweller et al., 2011). Chen (2020) further observes that reflective cycles of planning, teaching, and peer observation enhance competence development, illustrating that pedagogical skill evolves through experiential engagement with cognitively informed strategies like fast mapping.

6-Conclusion

This study examines the development of preservice EFL teachers' pedagogical competence in implementing fast-mapping vocabulary instruction in Hunan middle schools. It addresses the conceptualization of pedagogical competence, emphasizing the integration of professional knowledge, instructional skills, pedagogical beliefs, and reflective decision-making as essential components for effective teaching. The findings indicate that understanding these dimensions provides a foundation for designing instruction that bridges theory and practice, enabling preservice teachers to respond to diverse classroom challenges. Furthermore, the study delves into the pedagogical challenges inherent in vocabulary instruction, highlighting the reliance on traditional methods, the difficulty of sequencing and scaffolding vocabulary, and the constraints imposed by exam-oriented curricula and large class sizes. Evidence demonstrates that these factors hinder meaningful learning and underscore the need for innovative strategies that foster learner engagement and cognitive efficiency. The study also covers the role of fast mapping as a cognitive strategy, revealing that its use facilitates rapid word acquisition through minimal exposure, contextual inference, and repeated practice. Findings show that preservice teachers who implement fast mapping can enhance students' retention, comprehension, and motivation while developing their own instructional agility. Additionally, reflective practice and formative assessment are critical for translating cognitive principles into effective classroom pedagogy, reinforcing adaptive decision-making and context-sensitive teaching.

Moreover, the analysis indicates that teacher preparation programs must provide structured opportunities, including microteaching, peer observation, and reflective supervision, to enable preservice teachers to apply cognitively informed strategies in authentic settings. This engagement strengthens the alignment between theory and practice, fostering confidence, flexibility, and professional growth.

This study employed an exploratory qualitative design, drawing on secondary sources and thematic analysis to synthesize insights on preservice teachers' knowledge, instructional skills, and contextual challenges. The analysis is guided by Cognitive Load Theory, particularly the assumption that schema acquisition is essential for learning, highlighting the importance of structured, cognitively efficient instruction. Overall, the findings demonstrate that integrating fast mapping within teacher education enhances pedagogical competence, bridging theory and practice, improving vocabulary instruction, and informing policy and curriculum development in resource-constrained EFL contexts.

7-References

- Afalla, B., & Fabelico, F. (2020). Pre-service teachers' pedagogical competence and teaching efficiency. *Journal of Critical Reviews*.
- Aleksieva, L. (2025). Preparing pre-service teachers for the digital transformation of education: Exploring university teacher educators' views and practical strategies. *Education Sciences*, 15(4), 404. <https://doi.org/10.3390/educsci15040404>
- Alhammad KL, Habes M, Al Olaimat F, Haddad I (2021) Attitudes of Students of the Faculty of Mass Communication at Yarmouk University towards Using Video platforms in Distance Education. *Rev Int Geogr Educ Online* 11:1041–1052
- Ali S, Habes M, Youssef E, Alodwan M (2021) A Cross-Sectional Analysis of Digital Library Acceptance, & Dependency during Covid-19. *Int J Comput Digit Syst*
- Al-Skaf S, Youssef E, Habes M, et al (2021) The Acceptance of Social Media Sites: An Empirical Study Using PLS-SEM and ML Approaches. In: *Advanced Machine Learning Technologies and Applications: Proceedings of AMLTA 2021*. Springer International Publishing, pp 548–558
- Arremako Afolabi Innocent, J., Jiboku, O., & Kefas, G. N. (2025). Assessing strategies for teaching vocabulary and developing lexical competence in language education. *LingLit Journal Scientific Journal for Linguistics and Literature*, 6(1), 62–74.
- Asti, A. A., & Rosalinah, Y. (2025). Collaborative discussion in vocabulary learning through short stories. *FOSTER: Journal of English Language Teaching*, 6(4), 401–421.
- Bedilu, W. B., & Degefu, H. W. (2025). Exploring EFL teachers' perceptions and classroom practices in teaching vocabulary to children: The case of lower grade English teachers in Ethiopia. *Education 3-13*, 53(3), 469–481.
- Braun, V., & Clarke, V. (2021). Thematic analysis: A practical guide. *It Special? Journal of Teacher Education*, 59(5), 389–407.
- Carey, S., & Bartlett, E. (1978). Fast mapping as a word learning process. *Journal of Child Language*, 5(1), 182–189.
- Chen, C. (2020). Mentor-guided microteaching and teacher confidence: Evidence from EFL classrooms. *Asia-Pacific Journal of Teacher Education*, 48(4), 354–368.
- Cresswell, J. (2013). *Qualitative inquiry & research design: Choosing among five approaches*.
- Creswell, J. W., Hanson, W. E., Clark Plano, V. L., & Morales, A. (2007). Qualitative research designs: Selection and implementation. *The Counseling Psychologist*, 35(2), 236–264.
- Donkoh, S., & Amoakwah, A. (2024). The use and challenges of learner-centered pedagogy: Basic school teachers' perspective. *European Journal of Education and Pedagogy*, 5(1), 66–71.
- Doyle, A., Seery, N., & Gumaelius, L. (2019). Operationalising pedagogical content knowledge research in technology education: Considerations for methodological approaches to exploring enacted practice. *British Educational Research Journal*, 45(4), 755–769.
- El-haq, S. G., Taha, A., & Maqsoud, A. (2025). Enhancing primary school vocabulary through task-based learning: A study of effectiveness and challenges. *BSU-Journal of Pedagogy and Curriculum*, 4(7), 222–253.
- Elmahdi, O., & Hezam, A. M. (2020). Challenges for methods of teaching English vocabulary to non-native students. *Advances in Social Sciences Research Journal*, 7(5).
- Fathi, J., & Ebadi, S. (2020). Pedagogical competence and scaffolded instruction: Preparing preservice teachers for classroom challenges. *Journal of Education and Learning*, 9(3), 1–12.
- Gu, M. (2025). Challenges for EFL teachers in designing communication activities: A Chinese perspective. *SAGE Open*, 15(2), 21582440251341286.
- Habes M, Elareshi M, Salloum SA, et al (2022a) Students' perceptions of mobile learning technology acceptance during Covid-19: WhatsApp in focus. *EMI Educ Media Int* 1–19
- Habes M, Elareshi M, Ziani A, et al (2022b) Smart interaction and social TV used by Jordanian University students. *Technol Soc* 102110
- Habes M, Pasha SA, Ali S, et al (2023) Technology-Enhanced Learning Acceptance in Pakistani Primary Education. In: *European, Asian, Middle Eastern, North African Conference on Management & Information Systems*. Springer, pp 53–61
- Habes M, Salous MH, Al Jwaniat MI (2022c) Applying the Uses and Gratifications Theory to College Major Choice Using Social Networks Online Video. In: *International Conference on Advanced Machine Learning Technologies and Applications*. Springer, pp 388–400
- Jaya, A., Mortini, A. V., Andika, A., Susanti, E., Zaki, A. A., Fitriyah, A., & Anggraeni, R. (2025). *English for pre-service teachers*. PT. Star Digital Publishing, Yogyakarta-Indonesia.
- Jin, A. (2024). New policies orient compulsory English curriculum in China: Interpretation and implications. *Journal of Education, Humanities and Social Sciences*, 29, 180–187. <https://doi.org/10.54097/h493kh96>
- Krauss, S., Bruckmaier, G., Lindl, A., Hilbert, S., Binder, K., Steib, N., & Blum, W. (2020). Competence as a continuum in the COACTIV study: The "cascade model." *ZDM*, 52(2), 311–327.
- Labertoniere, D., Wilson, V. A., Pascual-Guardia, C., Skoruppa, K., & Zuberbühler, K. (2025). Fast mapping in hominids. *Animal Cognition*, 28(1), 53.
- Li, H. (2025). Reflective practice for pre-service teachers' professional development. *SAGE Open*, 15(3), 21582440251363136.
- Li, H., Pan, L., Seargeant, P., & Block, D. (2025). Exploring preservice teachers' translanguaging practices and perceptions in teacher training: A global Englishes perspective. *TESOL Quarterly*, 59(1), 103–135.
- Li, L. (2025). Language teacher cognition in EFL contexts. *Handbook of Language Teacher Education: Critical Review and Research Synthesis*, 53.
- Liu, D. (2024). The effects of segmentation on cognitive load, vocabulary learning and retention, and reading comprehension in a multimedia learning environment. *BMC Psychology*, 12(1), 4.
- Liu, G. (2025). To transform or not to transform? Understanding the digital literacies of rural lower-class EFL learners. *Journal of Language, Identity & Education*, 24(4), 928–945.
- Luo, Z., & Xie, P. (2025). A projection analysis of news critical literacy among Chinese EFL learners: An SFL approach. *SAGE Open*, 15(1), 21582440251321849.
- Ministry of Education of the People's Republic of China. (2022). *Compulsory education English curriculum standards (2022 edition)* [English translation]. https://www.britishcouncil.cn/sites/default/files/annex_4_-_cniec_translated_version_final.pdf
- Olafson, L., Grandy, C. S., & Owens, M. C. (2014). Qualitative approaches to studying teachers' beliefs. In *International handbook of research on teachers' beliefs* (pp. 128–149). Routledge.
- Qu, Z., & Abd Rahman, F. (2025). Effects of semantic mapping and rote memorization on EFL students' vocabulary acquisition. *Journal of Humanities, Arts and Social Science*, 9(12).
- Raikhel, A. M. (2025). Challenges and strategies for implementing a student-centered approach in teaching English as a second/foreign language.
- Salihoğlu, U., & Yalçın, I. Ş. I. L. (2022). A comparison of the use of three vocabulary learning methods by pre-service English language teachers.

- Shanlax International Journal of Education*, 11(1).
- Saraini, G. E., Karjono, J. C. S., & Putri, N. S. (2025). Exploring the impacts of mind mapping technique on EFL students' writing performance: A systematic literature review. *JELLT (Journal of English Language and Language Teaching)*, 9(2), 60–73.
- Selvakumar, P., Babitha, B. S., Varalakshmi, S., Mishra, B. R., Bhaskar, P., & Manjunath, T. C. (2025). Learning methods: Techniques for disadvantaged learners. In *Mitigating learner disadvantages in teaching and learning* (pp. 207–230). IGI Global Scientific Publishing.
- Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher*, 15(2), 4–14.
- Sun, L. (2024). Transforming pre-service EFL teacher education through critical cosmopolitan literacies: Voices from Mainland China. *Teaching in Higher Education*, 29(2), 599–618.
- Sweller, J., Ayres, P., & Kalyuga, S. (2011). *Cognitive load theory*. Springer.
- Sweller, J., Roussel, S., & Tricot, A. (2022). Cognitive load theory and instructional design for language learning. In J. W. Schwieter & Z. E. Wen (Eds.), *The Cambridge handbook of working memory and language* (pp. 859–880). Cambridge University Press. <https://doi.org/10.1017/9781108955638.045>
- Szeto, E. (2022). Social cohesion for societal prosperity: Teachers' inclusive development of career education for all students' growth in Hong Kong secondary schools. *Teaching and Teacher Education*, 115, 103722.
- Tahat DN, Habes M, Tahat K, et al (2023) Technology Enhanced Learning in Undergraduate Level Education: A Case Study of Students of Mass Communication. *Sustainability* 15:15280
- Teng, F. (2019). The effects of context and word exposure frequency on incidental vocabulary acquisition and retention through reading. *The Language Learning Journal*, 47(2), 145–158.
- Walton, E., & Ruzsnyak, L. (2020). Cumulative knowledge-building for inclusive education in initial teacher education. *European Journal of Teacher Education*, 43(1), 18–37.
- Wang S, Li N, Liu N, Habes M (2023) Transitioning from Information Sharing to Knowledge Services: Unpacking the Evolution of Rural Media Within the Context of Media Integration. *J Knowl Econ* 1–32
- Wu, J., Cheng, L., & Zhao, X. (2025). Exploring the efficacy of explicit encoding and fast mapping in second language vocabulary acquisition among Chinese graduate students. *Humanities and Social Sciences Communications*, 12(1), 1–22.
- Yeşil, Ş. (2025). Exploring prospective English language teachers' perceptions on leveraging microteaching and literature integration to enhance pedagogical competence in L2 teacher education. *Journal of Language Research*, 9(2), 137–150.
- Youssef NA, Elareshi M, Alghizzawi M, et al (2023) Enhancing Public Satisfaction: The Impact of Interactive Marketing in Social Institutions (the UAE Ministry of Community Development). In: International Conference on Business and Technology. Springer, pp 367–376
- Zeng, Y., Kuo, L. J., Chen, L., Lin, J. A., & Shen, H. (2025). Vocabulary instruction for English learners: A systematic review connecting theories, research, and practices. *Education Sciences*, 15(3), 262.
- Zou, F., Cui, Z., Lin, Q., Li, R., Sun, S., Zheng, J., ... & Zhu, X. (2024). Analysis of China's English curriculum standards for compulsory education from the perspectives of self-regulated learning. *Gipan*, 6(1), 5–18. <https://doi.org/10.3126/gipan.v6i1.68121>