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Teacher Perspectives on ChatGPT Integrated Vocabulary Instruction in a Flipped ESL Classroom

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ABSTRACT

Artificial intelligence (AI) has gained importance and popularity in education recently. Among AI tools, ChatGPT has attracted growing interest for its potential to support language learning. This study explores how ChatGPT-integrated pre-class vocabulary tasks influence student engagement in a flipped classroom among Malaysian primary school ESL learners. Specifically, it examines (i) how students engage with ChatGPT during pre-class vocabulary learning, (ii) what factors influence meaningful or surface-level engagement, and (iii) how teachers perceive the challenges and opportunities of integrating ChatGPT in vocabulary instruction. This paper draws on qualitative data from teacher interviews conducted as part of a larger mixed-methods study. The interviews were analysed using Braun and Clarke's six-phase thematic analysis approach. Findings revealed that ChatGPT initially fostered curiosity and vocabulary exploration, promoting schema activation and in-class readiness. However, over time, some students shifted towards passive use, relying on copy-paste behaviours. Engagement was shaped by learner autonomy, digital literacy, home support, and instructional scaffolding. Teacher reflections highlighted the need for guided prompts, closer monitoring of pre-class work, and more support for less independent learners. While ChatGPT offered cognitive benefits for

vocabulary development, its effectiveness depended on how it was embedded within instructional design. The study emphasises the importance of teacher agency and intentional scaffolding to ensure that AI tools enhance, rather than hinder, vocabulary learning. Practical implications are discussed for educators, curriculum developers, and researchers seeking to implement AI in language education.

Keywords: ChatGPT, flipped classroom, student engagement, teacher perception, vocabulary learning

INTRODUCTION

Vocabulary knowledge plays a fundamental role in English as a Second Language (ESL) learning. In the early stages of language development, young learners rely on vocabulary to understand meanings, interpret information, and communicate ideas. Adequate lexical knowledge also supports learners' ability to participate in classroom interactions and engage effectively in academic learning tasks. Vocabulary acquisition in Malaysia is closely linked to national and global literacy standards, yet gaps in proficiency persist despite curriculum restructuring. A well-developed vocabulary is essential for effective communication and long-term academic success, particularly in reading. With primary-level students, word-level vocabulary can be an obvious limitation to sentence building and textual understanding, which is why vocabulary is a vital concern in ESL teaching (Gellert et al., 2021). Conventional methods of vocabulary acquisition often focus on memorisation and therefore have little retention and low engagement (Yang, 2021).

Given these challenges, educational technology, particularly artificial intelligence (AI), has introduced new possibilities for vocabulary instruction. One such tool, ChatGPT, is an AI-based language model to provide real time response and scaffolded language input. Educationists and scholars have started researching its use in educational institutions, with its possible use to facilitate vocabulary acquisition by engaging in dialogue (Albadarin et al., 2024; Al-Khresheh, 2024). ChatGPT provides learners with personalised support and additional language exposure outside the classroom, particularly for students who lack opportunities to interact with rich linguistic environments (Kambam et al., 2025; Zakarneh et al., 2025). The growing use of ChatGPT reflects a broader shift towards digital tools that promote learner autonomy, but the assumed educational quality of these tools continues to be strongly reliant on pedagogical integration.

These developments have also influenced the adoption of flipped classroom approaches in language education. The flipped classroom is an instructional approach in which content delivery takes place before class, often through digital resources, while classroom time is used for interactive and application-based activities. With the advancement of digital learning technologies, this approach has gained increasing attention as it allows greater flexibility in accessing learning materials and supports more active classroom engagement. The flipped classroom model can be effectively applied in language learning to optimise vocabulary exposure and use, particularly when integrated with tools such as ChatGPT. This approach enables students to learn new vocabulary in advance, allowing them to

participate more actively in productive classroom activities (Adipat, 2025; Bobkina et al., 2025). The effectiveness of this model depends on the quality of pre-class interaction and the design of in-class activities. Thus, attention should be given to how students interact with digital tools and how teachers organise the use of AI in flipped vocabulary instruction.

Literature Review

Recent research has shifted from evaluating vocabulary instruction in terms of exposure to examining how digital tools reshape the cognitive processes underlying learning. Artificial intelligence (AI), particularly ChatGPT, is often associated with interactive and personalised input that extends language practice beyond classroom boundaries (Al-Khresheh, 2024; Albadarin et al., 2024). From a constructivist perspective, such interaction has the potential to support active meaning-making through dialogue and exploration. However, emerging evidence challenges this assumption by showing that interaction does not necessarily lead to meaningful learning when cognitive engagement is limited (Calles, 2025; Lo et al., 2024). Learners may engage superficially by copying responses or relying on automated outputs without processing meaning. This reflects a broader techno-centric bias in the literature, where the presence of interaction is equated with learning, despite constructivist theory emphasising the need for active cognitive involvement. Therefore, recent studies argue that the effectiveness of AI tools lies not in their features but in how learners engage with them, highlighting the need to critically examine engagement quality rather than tool capability.

Within this shift, the flipped classroom has been widely adopted as a pedagogical approach that redistributes learning and emphasises pre-class preparation. Research suggests that early exposure to vocabulary can activate prior knowledge and support deeper in-class participation, aligning with Schema Theory (Anderson, 1984) (Adipat, 2025; Bobkina et al., 2025). However, this assumption has been increasingly problematised, as pre-class engagement is found to be inconsistent and highly dependent on learner readiness and task design (Han, 2025; Zhang, 2024). While some learners demonstrate autonomy and preparedness, others engage in mechanical completion that limits cognitive processing (Chen & Shih, 2025; Huang & Chang, 2024). From a scaffolding perspective, this suggests that autonomy alone is insufficient without structured support that guides learners towards meaningful engagement (Hong et al., 2025; Wood et al., 1976). This raises a critical issue within flipped learning literature, where autonomy is often idealised but insufficiently operationalised. Despite growing interest in integrating AI into flipped classrooms, limited research has examined how tools such as ChatGPT shape the depth and nature of pre-class vocabulary engagement.

More recent studies have extended this discussion by identifying the conditions that influence engagement in AI-mediated learning, particularly learner autonomy, digital literacy, and sociocultural context. While some learners use AI tools to support inquiry and extend understanding, others rely on shortcut strategies that reduce cognitive effort, reflecting uneven patterns of engagement (Calles, 2025; Stuchlikova & Weis, 2024). This aligns with the Noticing Hypothesis, which suggests that learning requires conscious attention to input rather than passive exposure (Schmidt, 1990). In addition, disparities in

home support and digital access have been shown to mediate participation in pre-class tasks, potentially widening existing learning gaps (Erdreich, 2025; Hou et al., 2024). These findings highlight that engagement is not solely an individual process but is shaped by broader sociocultural conditions. In response, scholars emphasise the importance of teacher mediation through scaffolding and corrective feedback to sustain meaningful engagement (Hong et al., 2025; Liu & Hwang, 2024). However, existing literature remains limited in capturing teachers' perspectives, particularly in primary ESL contexts where learners require closer guidance and monitoring. Therefore, there is a need to investigate how teachers interpret, regulate, and adapt AI-integrated vocabulary instruction within flipped classrooms to ensure meaningful learning outcomes.

Research Gap

Vocabulary acquisition remains a key concern in Malaysian ESL instruction. However, limited attention has been given to how new technologies influence learner engagement, especially at the primary school level. Though the literature has discussed the overall advantages of flipped learning and how AI tools can improve language learning, research on the intersection of the two in vocabulary development is insufficient (Alas & Anshari, 2025; Phanwiriyarat et al., 2025). Specifically, there is a lack of research on the perspective of teachers regarding the application of AI in vocabulary training among young learners (Dincer & Bal, 2024). Considering the rising popularity of digital tools in language learning, it is important to understand how educators perceive and approach this process to be able to make informed pedagogical choices.

Past studies on how students engage with artificial intelligence tools during the pre-class stage of flipped learning remain limited (Han, 2025; Namaziandost, 2025). The most important aspect is not whether the students use such tools, but rather the manner in which they use such tools and what factors contribute to the quality and extent of such engagement. Specifically, in young learners of English as a Second Language, behaviour of the learners when using tools like ChatGPT is highly variable depending on the factor of autonomy, digital literacy and the degree of support at home (Alotaibi et al., 2025; Lo et al., 2024; Zulkefli & Ismail, 2025). Without a deeper understanding of these factors, AI-assisted tasks may lead to superficial learning and widen existing learning gaps (Chandra, 2025; Kour et al., 2025). This gap can be addressed through qualitative data derived from teachers' reflections and classroom observations, allowing for informed instructional adjustments. To address these gaps, there is a need for a focused investigation into how ChatGPT is integrated into pre-class vocabulary instruction and how such integration shapes learner engagement from the teacher's perspective.

Research Purpose and Questions

This study explores teacher perspectives on the integration of ChatGPT in pre-class vocabulary instruction within a flipped ESL classroom. Pre-class vocabulary instruction refers to learning activities that introduce and practise vocabulary before the lesson begins. It aims to understand how such integration influences student engagement, and what pedagogical considerations arise when using AI in primary language education. Drawing

on qualitative data from teacher interviews, the study addresses the following research questions:

RQ1: How do students engage with ChatGPT during pre-class vocabulary learning tasks in a flipped classroom setting?
RQ2: What factors contribute to meaningful or surface-level engagement with ChatGPT in vocabulary learning?
RQ3: How do teachers perceive the challenges and opportunities of integrating ChatGPT in pre-class vocabulary instruction?

By addressing these questions, the study contributes to emerging discussions on technology-mediated engagement in primary school ESL classrooms and offers practical insights into how teachers navigate the instructional complexities of AI use.

Theoretical Framework

This study is grounded in Constructivist Learning Theory (Piaget, 1972; Vygotsky, 1978), which views learners as active agents in creating meaning rather than passive recipients of knowledge. Constructivism brings together two complementary theories. Piaget's cognitive constructivism (Piaget, 1972) underscores the importance of personal discovery and cognitive assimilation, while Vygotsky's social constructivism (Vygotsky, 1978) stresses that learning develops through guided interaction and the mediation of tools (Yıldız, 2025). In the context of flipped classrooms, this perspective is significant because students engage with pre-class tasks independently before negotiating meaning collaboratively in class. When learners use ChatGPT to explore vocabulary and generate examples, they are participating in meaning-making that is consistent with constructivist principles. The approach emphasises that students learn best through self-directed inquiry and active participation with instructional materials, not simply through teacher transmission (Alsagoor et al., 2025; Zakarneh et al., 2025).

Constructivism clarifies the learner's engagement in active inquiry, whereas Schema Theory (Anderson, 1984) offers an understanding of how existing knowledge frameworks facilitate vocabulary acquisition within a flipped learning model. Schema Theory (Anderson, 1984) suggests that understanding and memory are improved when new information is linked to pre-existing cognitive structures (Rusen, 2024). This study demonstrates that pre-class vocabulary tasks mediated by ChatGPT activate schemata, allowing learners to engage in classroom activities with a foundational basis that promotes deeper processing. Students who encounter and practise target words beforehand are more prepared to incorporate them into meaningful classroom interactions. The theory elucidates the role of pre-class engagement in enhancing readiness and facilitating more effective in-class application. This study conceptualises ChatGPT activities as schema-activating tools, thereby positioning pre-class learning as a link between prior knowledge and classroom application, which enhances the coherence of flipped vocabulary instruction.

Another theoretical explanation is the Scaffolding Theory, which was firstly proposed by Wood, Bruner and Ross (1976). Scaffolding refers to the temporary support provided by

teachers to help learners progress from independent performance to guided performance. In the technology mediated setting, scaffolding quality has the power to make learners maintain a meaningful engagement or engage in superficial habits like imitating answers (Hong et al., 2025). In this research, scaffolding is observed in the design of guided prompts, the offering of exemplars, and the monitoring of pre-class activities. Such supports are especially important to learners whose autonomy is less strong or who lack digital literacy of sufficient strength to prevent them from being cognitively engaged and instead dependent on mechanical completion. The Scaffolding Theory thus emphasises the role of the teacher to provide support based on the needs of the learners, and it allows reinforcing the role of the instructional design in the maximisation of the value of AI-mediated flipped learning.

Finally, Noticing Hypothesis (Schmidt, 1990) illuminates how teachers address learner errors and misconceptions in vocabulary development. Corrective feedback involves providing timely and targeted responses that refine accuracy and prevent fossilisation of mistakes (Brown et al., 2023). In a flipped classroom, however, pre-class tasks completed with ChatGPT often lack immediate teacher correction, raising the risk that students internalise inaccuracies or fail to process answers deeply. The findings of this study reveal how teachers strategically reintroduced feedback during class to close this gap, guiding learners to reflect on and adjust their understanding. This theoretical lens is vital for interpreting how teachers manage the limitations of independent AI use by ensuring that formative correction remains integral to the learning cycle.

METHODOLOGY

Research Design

This study adopted a qualitative approach as part of a broader mixed-methods design to explore teacher perspectives on AI-integrated vocabulary instruction. The focus of this article is the qualitative strand, which offers in-depth insights into how ChatGPT, as a pre-class tool within a flipped classroom model, shaped learner engagement and classroom practice. By drawing on semi-structured interviews with the teacher who implemented the intervention, the study seeks to understand not only what occurred during instruction but also how the teacher interpreted and responded to evolving student behaviours. This approach was selected to uncover patterns, reflections, and contextual factors that cannot be captured through quantitative metrics alone.

Context and Participants

The study was conducted in a Year 3 ESL classroom at a government primary school located within an institutional compound in a semi-urban area of Malaysia. The participants were selected as Year 3 students are at a critical stage of cognitive development, transitioning from learning to read to reading to learn, where vocabulary acquisition becomes essential for academic progression (Kaliappan & Mohamad, 2023). In addition, this group benefits from engaging and interactive learning approaches, making

them suitable for a flipped classroom model integrated with artificial intelligence to enhance motivation and engagement (Katona & Gyonyoru, 2025). The class comprised learners identified as low to moderate achievers in English based on school-based assessments, with most performing between TP3 (A1 Mid) and TP4 (A1 High). TP3 (A1 Mid) and TP4 (A1 High) represent learners who only meet or are just beginning to exceed basic curriculum expectations, showing adequate but still limited comprehension and vocabulary skills. The flipped classroom model was implemented with this group over a 20-week period. One English teacher participated in the qualitative component of the study. She had over ten years of experience in primary school English language teaching and had demonstrated a consistent commitment to incorporating innovative strategies in the classroom. While not formally trained in artificial intelligence applications, she was digitally literate and showed enthusiasm in exploring ChatGPT as a pedagogical tool. Her dual role as classroom implementer and reflective practitioner positioned her to provide both experiential and critical insights into the integration of AI in vocabulary instruction.

Data Collection

This data was obtained through two sets of semi-structured interviews with the teacher, the first one in the middle of the intervention (Week 10) and the second one in its end (Week 20). The 20-week duration was designed to allow sufficient time to observe changes in students' engagement, vocabulary learning development, and the teacher's instructional adjustments throughout the implementation of the model. The interviews explored the teacher's perceptions of student engagement, reflections on pre-class ChatGPT use, and instructional adaptations across the intervention period. The interview questions were designed based on the Interview Protocol Refinement Framework (Castillo-Montoya, 2016). Prior to the interviews, informed consent was obtained from the teacher, including permission for audio recording. The interviews were audio-recorded, and brief notes were taken to capture key points and non-verbal cues. The recordings were subsequently transcribed and reviewed to ensure accuracy and completeness for analysis. Follow-up prompts were also employed to encourage elaboration, particularly in relation to observed student behaviours, instructional decisions, and the perceived affordances and limitations of AI. Each interview lasted approximately 45–60 minutes and was conducted in a quiet setting to ensure confidentiality and focus.

Data Analysis

The interview transcripts were analysed by using Braun and Clarke's (2006) six-phase thematic analysis approach with the assistance of Atlas.ti software to facilitate systematic organisation of the transcripts, coding, and memo writing, thus allowing a clear and traceable analytic path. The six phases involved familiarisation with the data, generation of initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the final report. Both inductive and deductive coding were applied in the analysis. Inductive coding enabled themes to emerge naturally from the teacher's reflections. Deductive coding, on the other hand, was guided by the study's theoretical framework. This framework drew on key constructs from Constructivism, Schema Theory, Scaffolding Theory, and Noticing Hypothesis Theory. To ensure transparency and rigour,

Atlas.ti was used to organise the codes, connect excerpts to emerging themes, and generate visual networks. By following this process, the themes captured the teacher's nuanced views and connected them meaningfully to the study's theoretical framework.

Trustworthiness

To ensure the trustworthiness of the qualitative findings, multiple strategies were employed. Member checking was conducted after each interview by summarising key interpretations and confirming them with the teacher to enhance credibility. An audit trail was maintained, consisting of coding decisions, analytical memos, and theme development records. Atlas.ti software further supported this process by storing coded excerpts, organising memos, and generating visual maps of theme connections, thereby strengthening dependability and confirmability. These records enabled an external reviewer to trace the analytical process. The researcher also adopted a reflexive stance, acknowledging her positionality as both curriculum designer and analyst. Although the insider perspective provided rich contextual insight, the use of Atlas.ti and triangulation with teacher journal entries minimised potential bias and strengthened the credibility and trustworthiness of the findings.

FINDINGS

This section explores three interrelated themes that shed light on the teacher's views about how students engaged with ChatGPT during their pre-class vocabulary tasks in the flipped ESL classroom. The analysis addresses the mechanisms of engagement (RQ1), the conditions that influenced its depth (RQ2), and the teacher's pedagogical reflections (RQ3). As summarised in Table 1, the themes, codes, and representative excerpts illustrate how patterns of engagement evolved across the intervention and how these patterns were interpreted through relevant theoretical lenses. The findings suggest that ChatGPT's value as a vocabulary support tool was shaped not only by its accessibility and novelty but also by how learners used it, the scaffolding provided by the teacher, and the wider socio-digital environment in which learning took place.

Table 1. Themes, Codes, and Representative Quotes from Teacher Interviews on ChatGPT-Integrated Pre-Class Vocabulary Tasks

Theme	Code	Representative Quote	Related RQ	Theoretical Lens
3.1 From Curiosity to Compliance	Initial Curiosity and Exploration	"Some even try to explore extra questions like 'Can you give me more sentences?' or 'What is another word for happy?'" (Week 10)	RQ1	Constructivism
	Schema Activation and Classroom Readiness	"Some of them have already been exposed to the vocabulary… a few students immediately raise	RQ1	Schema Theory

		their hands…" (Week 10)		
	Copy-Paste Habits and Passive Engagement	"Some students became too dependent on just copying the answer from ChatGPT…" (Week 20)	RQ1	Constructivism (misalignment)
		"Some students treat it like copy-paste homework." (Week 10)	RQ1	Constructivism (misalignment)
3.2 Conditions Shaping Engagement Quality	Learner Autonomy and Digital Literacy	"They consistently did the pre-class tasks, explored extra questions on ChatGPT…" (Week 20)	RQ2	Constructivism, Self-regulation
	Instructional Scaffolding Needs	"Maybe more guided prompts or short tutorial videos might help support their understanding…" (Week 20)	RQ2	Scaffolding Theory
	Socio-Digital Inequity and Home Support	"The biggest challenge is student self-discipline and home support…" (Week 20)	RQ2	Sociocultural Theory
3.3 Teacher Mediation and Recalibration	Realisation of Scaffolding Deficit	"I would probably give more guided prompts… and check their pre-class work more strictly…" (Week 10)	RQ3	Scaffolding Theory
	Formative Monitoring and Accountability	"Just to make sure they really do it meaningfully, not just copy-paste." (Week 10)	RQ3	Noticing Hypothesis Theory
	Responsible AI Integration	"Start small… train students and parents… provide clear, simple prompts." (Week 20)	RQ3	Teacher Agency, Implementation

Shifting Patterns of Learner Engagement with ChatGPT

At the beginning of the intervention, the teacher observed a marked rise in learners' enthusiasm when using ChatGPT to complete their pre-class tasks. Learners demonstrated curiosity and motivation, frequently going beyond the requirements of the worksheet to pose follow-up questions. The teacher reflected, *"They enjoy typing the prompts and getting instant answers. Some even try to explore extra questions like 'Can you give me more sentences?' or 'What is another word for happy?'"* (Excerpt 1). This behaviour indicates meaningful engagement, aligning with the constructivist view of learner-initiated inquiry in which students actively build understanding through interaction rather than simply receiving information. Similar patterns of initial curiosity have been reported in other AI-assisted language learning contexts, where the novelty and interactivity of digital tools stimulate learner agency (Feng, 2025; Hong & Guo, 2025). Furthermore, Han & Chen (2024) and Samaila and Al-Samarraie (2024) suggest that pre-class digital activities can

encourage exploratory learning and prompt self-directed questioning. However, several researchers caution that these novelty effects may diminish over time, highlighting the need for sustained pedagogical design and support to maintain engagement beyond the initial use of the tool (Lee et al., 2025; Stoa & Chu, 2023).

This initial engagement is consistent with Schema Theory (Anderson, 1984), as learners entered the classroom with partially activated schemata that allowed for a smoother transition into productive language use. The teacher noted, *"Some of them have already been exposed to the vocabulary… a few students immediately raise their hands and can give sentences like 'I am playing volleyball with my friends'"* (Excerpt 2). These observations indicate that ChatGPT tasks successfully primed learners for deeper vocabulary processing, leaving them better prepared and more confident during classroom interactions. According to Khoueiry and Nabhan (2024) and Buchin and Mulligan (2024), pre-class vocabulary exposure can enhance learners' background knowledge and encourage greater participation in class. Nevertheless, contrasting evidence suggests that schema activation may be limited when pre-class tasks lack sufficient guidance or are treated superficially (Zhang, 2024). This suggests that while ChatGPT has the potential to activate relevant schemata, its effectiveness depends on how tasks are designed and scaffolded by the teacher.

However, this pattern was not sustained across the entire cohort. For a subset of students, the teacher observed a shift from exploratory use to mechanical completion as the intervention progressed. She remarked, "*"Some students became too dependent on just copying the answer from ChatGPT without processing it fully"* (Excerpt 3), and earlier noted, *"Some students treat it like copy-paste homework"* (Excerpt 4). Meanwhile, other students remained engaged and continued to approach the tasks with enthusiasm. This behavioural change among certain learners marked a decline in cognitive engagement and the emergence of superficial learning habits. Recent research has similarly noted that learners misuse AI tools for shortcutting tasks rather than deepening understanding (Calles, 2025; Stuchlikova & Weis, 2024). In contrast, Su et al. (2024) and Yang (2025) reported that learners received structured prompts and accountability measures, sustained inquiry and productive engagement were maintained. This contrast shows that the decline seen in this study was not unavoidable but depended on how much scaffolding and monitoring were built into the task design.

Conditions Shaping Engagement Quality

The divergence in learner behaviour prompted the teacher to reflect on why some students sustained meaningful use of ChatGPT while others reverted to surface-level engagement. A key factor was learner autonomy. She noted, *"They consistently did the pre-class tasks, explored extra questions on ChatGPT, and came to class ready"* (Excerpt 5). These learners demonstrated self-motivation and initiative, using the tool to extend their understanding. Their behaviour reflected the principles of Constructivism, suggesting that when students possess metacognitive skills and autonomy, technology can amplify engagement and deepen learning. Prior studies similarly highlight that autonomy and self-regulation are critical in flipped classrooms and technology-mediated learning (Chen &

Shih, 2025; Liu et al., 2024). However, contrasting evidence shows that autonomy alone may not sustain engagement unless paired with structured scaffolds and accountability measures (Huang & Chang, 2024). This indicates that while autonomy is foundational, it is insufficient as a standalone condition for sustained inquiry.

In contrast, learners with a lack of self-regulation often reverted to mechanical strategies. The teacher expressed uncertainty about their actual understanding: *"I don't always know if they really understood or just copied the answers"* (Excerpt 6). This indicates a failure in formative engagement, as pre-class preparation does not lead to cognitive readiness. From the perspective of Scaffolding Theory (Wood et al., 1976) these learners lacked the temporary supports needed to shift from dependency to autonomous learning. Han (2023) reported the similar pattern in flipped learning studies where weaker learners disengaged when pre-class tasks were left unstructured. Yet, research also demonstrates that with tiered prompts, modelling, and peer scaffolds, struggling learners can sustain deeper engagement with pre-class tasks (Kwan et al., 2025). The contrast highlights that disengagement is not inevitable but reflects missed opportunities for differentiated scaffolding in the design of pre-class activities.

Beyond individual differences, the sociocultural context further shaped how learners engaged with ChatGPT. The teacher highlighted disparities in digital independence and home support: *"The biggest challenge is student self-discipline and home support……. Not every student has the same level of independence"* (Excerpt 7). This reflects the influence of ecological conditions on learning, consistent with Sociocultural Theory (Vygotsky, 1978), which emphasises that performance is mediated by environmental resources and social practices. Previous studies have also found that inequities in digital access and parental involvement influence how effectively learners participate in flipped or AI-mediated tasks (Erdreich, 2025; Hou et al., 2024). While some research suggests that AI tools may reduce gaps by providing additional input outside school (Hubballi et al., 2025; Suresh Babu et al., 2025; Thalji & Alkhasawneh, 2025), findings from this study suggest the opposite risk. Without consistent home support, AI integration may widen the gap and reward learners who are already independent and digitally literate.

Teacher Perspectives on ChatGPT- Mediated Vocabulary Instruction in Flipped ESL Classrooms

In response to the challenge of sustaining meaningful engagement, the teacher engaged in critical reflection on her instructional practices and identified areas for improvement. She remarked, *"If I were to do it again, I would probably give more guided prompts for ChatGPT… I might also check their pre-class work more strictly"* (Excerpt 8). These reflections show the teacher becoming more aware of her crucial role in guiding technology-mediated engagement. She responded by reintroducing formative checks and clarifying expectations so that learners engaged with the content meaningfully instead of treating it as a routine task. This recalibration aligns with the Noticing Hypothesis (Schmidt, 1990) that emphasizes the need for immediate and targeted intervention to prevent misconceptions from fossilising (Liu & Hwang, 2024; Nhac, 2022). Consistent findings have been reported in flipped classroom research, where formative monitoring has

been shown to sustain student accountability and engagement (Liu & Hwang, 2024). Meanwhile, other research warns that excessive monitoring may unintentionally reduce learner autonomy (Nopas, 2025), suggesting that corrective practices must balance regulation with opportunities for inquiry.

Beyond immediate corrective feedback, the teacher also recognised the need for broader implementation support. She explained, *"Start small… train students and parents how to use tools like ChatGPT effectively… provide clear, simple prompts"* (Excerpt 9). This acknowledgement reflects a pragmatic view that the successful integration of AI is not only dependent on tool availability but also on stakeholder readiness and shared responsibility. Her comments resonate with research emphasising that teacher agency plays a central role in mediating technology adoption (Sang et al., 2023; Thapa et al., 2024). Teachers are not passive implementers but active decision-makers who must adapt strategies, scaffold learners, and engage parents to ensure equitable and meaningful integration. This dynamic interaction between teacher mediation, influencing factors, and learner engagement is illustrated in Figure 1, which maps the pathways of student engagement and highlights the critical mediating role of the teacher in ChatGPT-integrated pre-class vocabulary tasks. Nevertheless, contrasting perspectives warn that expectations placed on teachers to orchestrate digital tools can lead to increased workload and implementation fatigue (Guilbert et al., 2025), highlighting the importance of systemic support for professional development and manageable integration.

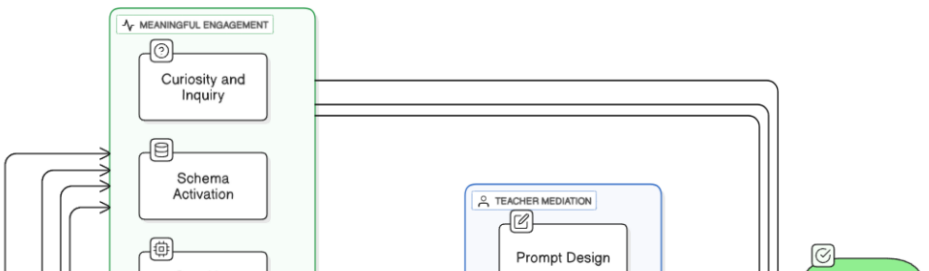

Figure 1. Findings on Student Engagement Pathways, Influencing Factors, and Teacher Mediation in ChatGPT-Integrated Pre-Class Vocabulary Tasks

DISCUSSIONS

This study explored how the use of ChatGPT in pre-class vocabulary tasks within a flipped ESL classroom influenced student engagement, as seen from the teacher's perspective. Although the early use of the tool sparked curiosity and supported learner autonomy, the findings pointed to a more complex pattern. Learners initially engaged in meaningful inquiry, but over time, their participation declined, and many began relying on more superficial strategies. While this shift from curiosity to compliance provides a meaningful insight into changing patterns of engagement, the finding is based on the observations of a single teacher and should therefore be interpreted with caution when making broader generalisations. In discussing these patterns, this section examines the mechanisms, conditions, and instructional adjustments that shaped student engagement. In doing so, it offers important insights into both the potential and the limitations of using AI in early language education.

A key finding of this study is that learner engagement shifted over time. Learners interacted enthusiastically with ChatGPT, asking follow-up questions, experimenting with synonyms, and extending their vocabulary exploration at the beginning of the intervention. This pattern reflects constructivist ideas of learner-initiated inquiry (Vygotsky, 1978) and activates prior knowledge in ways that support Schema Theory (Anderson, 1984). Similar

findings have been reported in flipped learning studies where digital pre-class tasks improved learners' readiness and vocabulary use (Chen et al., 2023; Fahmi et al., 2024). Research on ChatGPT also indicates that its immediacy and interactive nature can encourage exploratory learning behaviours (Al-Hafdi & AlNajdi, 2024; Mavidi, 2025). Yet, sustaining this curiosity remains a challenge. Lee et al. (2025) observed that novelty-driven engagement in AI-supported learning tended to decline without consistent scaffolding, a trend mirrored by the shift toward copy-paste strategies seen in this study. This suggests that while AI can spark initial inquiry, its motivational effect is fragile unless it is deliberately supported through careful instructional design.

The difference between persistent and superficial engagement shows how learner autonomy and digital competency may change things. In this study, learners with more self-regulation and digital proficiency engaged in more profound inquiry, while those with weaker self-regulated resorted to mechanical completion. This finding aligns with studies that connects autonomy to significant participation in flipped learning (Chardonnens, 2025; Chen, 2025; Ravandpour, 2022; Zharmukhanbetov & Singh, 2023). Simultaneously, contradictory research indicates that autonomy alone is inadequate. In the absence of teacher-implemented accountability mechanisms, even motivated learners may resort to shortcuts (Basri, 2023). Namaziandost (2025) showed that when teachers included structured reflection prompts in AI tasks that learners did before class, learners of all skill levels stayed interested. These similarities highlight that autonomy is optimally seen not as a static learner characteristic but as a state fostered by scaffolding, oversight, and feedback.

The presence or absence of instructional scaffolding emerged as another critical factor. Although the pre-class tasks were aligned with the target vocabulary, they did not provide tiered support for less independent learners. The teacher reflected that 'guided prompts or short tutorial videos' might have helped struggling students, pointing to a missed opportunity to include more differentiated support. Scaffolding Theory (Wood et al., 1976) emphasises that temporary supports help bridge the gap between what learners can do on their own and what they can achieve with guidance. Research on flipped and AI-supported learning shows that task designs with graduated supports, including model responses, interactive examples, and peer guidance, can sustain engagement and reduce reliance on rote strategies (Gasaymeh & Almohtadi, 2024; Namaziandost, 2025). By contrast, when such scaffolds are missing, learners often underuse the tools or use them in ways that prioritise speed over learning (Leoste et al., 2025; Peuker, 2024; Uppal & Hajian, 2025). The evidence from this study suggests that integrating AI effectively involves more than simply providing the tool. It also requires scaffolding that takes into account differences in learner autonomy and digital readiness.

The sociocultural context also shaped how students engaged with ChatGPT. The teacher noted disparities in digital independence and home support, highlighting that equitable engagement in flipped classrooms cannot be assumed. This aligns with socio-digital equity literature emphasising that engagement is mediated by home routines, parental involvement, and access to resources (Yaseen et al., 2025; Zhang et al., 2024). While Mac Fadden et al. (2024) and Rottner et al. (2025) argue that AI can mitigate gaps by offering additional language input, they suggest the opposite risk: when home support is

inconsistent, AI integration may amplify inequalities by advantaging already independent learners. For policymakers, this raises important considerations. Successful flipped and AI models in primary classrooms require attention not only to classroom practices but also to the wider systems that enable or limit learning.

Teacher mediation evolved as the final but perhaps most crucial approach. The teacher's choice to adjust teaching by offering more guided prompts, overseeing pre-class outputs, and engaging parents demonstrates a developing recognition of her influence in facilitating technology-mediated interaction. This corresponds with the Noticing Hypothesis Theory, which emphasises the need of prompt action to enhance accuracy and prevent the fossilisation of mistakes (Nhac, 2022; Singh & Halim, 2023). Studies on the use of AI in educational settings emphasise that the orchestration by teachers, rather than the AI technology itself, dictates the level of involvement (Ahmed & Sadiq, 2025; Seo et al., 2025). Simultaneously, some cautions have been raised. Muslimin (2025) observes that excessive surveillance may diminish learner autonomy, while Buda and Kovács (2024) advise against the acceleration of teacher effort due to digital innovation. This indicates that while teacher mediation is essential, it requires backing from professional growth and pragmatic institutional expectations to prevent burnout.

These findings challenge overly optimistic views of AI in education. ChatGPT showed clear benefits for vocabulary learning, yet its impact depended on the way tasks were scaffolded, the attention given to learners' sociocultural contexts, and the degree of teacher involvement in guiding its use. This study adds broad views on AI in education by showing that engagement does not arise from technology alone but from a combination of thoughtful design, ongoing reflection, and human judgment. For classroom practice, teacher training should include strategies for creating scaffolded AI tasks, ways to monitor pre-class work without adding extra burden on teachers, and approaches to involve parents as partners in supporting digital readiness. For policy, this highlights the need to adapt AI integration to local contexts in order to address equity gaps, particularly in settings with limited resources. In sum, this study shows that even in an age of automation, teacher professionalism and strong systemic support are the key factors that determine whether AI tools enhance or undermine meaningful learning.

CONCLUSION AND RECOMMENDATIONS

This study explored teacher perspectives on using ChatGPT in pre-class vocabulary instruction within a flipped ESL classroom and shed light on the mechanisms that shaped student engagement. The findings revealed a dual narrative. Some learners engaged actively and asked questions in ways that reflected constructivist learning principles, whereas others took a more passive approach and used ChatGPT mainly as a copy-and-paste tool. These differences in behaviour were shaped by learner autonomy, digital literacy, instructional scaffolding, and home support. This highlights that the pedagogical value of AI depends less on its sophistication and more on how intentionally it is designed and implemented. The flipped model offered valuable opportunities for vocabulary readiness and schema activation, but its success relied on tailored scaffolding and

consistent teacher guidance. In this way, ChatGPT acted less as a neutral tool and more as a pedagogical amplifier, boosting vocabulary learning for students who were prepared and independent, while unintentionally reinforcing disengagement among those who were not. However, these findings should be interpreted with caution, as they are based on the perspective of a single teacher and may not be generalisable to other contexts.

Moving beyond classroom observations, this study questions the view of AI as either a perfect solution or a major threat and argues that its impact depends on how it is designed pedagogically and shaped by the learning context. The evidence highlights that technology alone cannot transform learning. Its value becomes clear when it is combined with thoughtful instructional choices, responsive teacher practices, and equitable support structures. When integrated carefully, ChatGPT encouraged inquiry, supported vocabulary growth, and helped students prepare for class. Without adequate scaffolding, it risks leading to more superficial forms of engagement. This conclusion adds nuance to discussions on constructivist and scaffolded learning, showing that AI tends to strengthen learners' existing trajectories rather than generate entirely new ones. Ultimately, the study concludes that AI integration is not pedagogically neutral and that its long-term promise relies on aligning technological possibilities with deliberate instructional design and consistent teacher involvement.

The findings point to three levels of action, namely classroom practice, professional development, and policy. At the classroom level, teachers are encouraged to embed ChatGPT within scaffolded lessons by designing prompts that guide inquiry, using formative checks to monitor how it is used, and adjusting support according to learners' readiness. For professional development, teachers need training that extends beyond technical skills and includes strategies for managing learner expectations, building critical digital literacy, and preparing for both the opportunities and challenges that AI brings to early language learning. At the policy level, it is important for stakeholders to recognise the realities of primary classrooms, especially those in under-resourced settings, and to invest not only in devices but also in teacher capacity building, learner support systems, and parental engagement. Equitable integration requires more than access to technology. It calls for coordinated efforts to ensure that flipped models enhance learning rather than widen existing disparities. Future research could build on this study by including learner voices, tracking engagement over time, and comparing different AI tools to determine which design features are most effective in supporting sustained vocabulary learning.

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Declaration of Generative AI and AI-assisted Technologies in the Writing Process

This manuscript was developed with the assistance of ChatGPT for the purpose of improving grammar, sentence structure, and overall clarity of the writing. In addition, Eraser AI was used to

assist in the creation of figure included in this manuscript. All outputs generated by these tools were carefully reviewed, edited, and validated by the author(s). The author(s) take full responsibility for the content and the final version of the manuscript submitted for publication.

Conflict of Interest

The authors have no conflicts of interest to declare.

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Authors' Contributions

The authors confirm contribution to the paper as follows: study conception and design, qualitative data collection, analysis and interpretation of results, and draft manuscript preparation were carried out by Farhana Atiqah Ahmad Radzuan. Review, critical revision, and refinement of the manuscript were undertaken by Marina Mohd Arif. All authors reviewed the results and approved the final version of the manuscript.