Teaching English in the Age of AI: A Qualitative Study of Primary English Teachers' Perceptions

Amy Ling Wen Xin.* , Melor Md Yunus., Hanita Hanim Ismail

Faculty of Education, Universiti Kebangsaan Malaysia, Bangi, Malaysia

***Corresponding Author**

DOI: https://dx.doi.org/10.47772/IJRISS.2025.91100348

Received: 25 November 2025; Accepted: 01 December 2025; Published: 10 December 2025

ABSTRACT

The adoption of AI tools in English language teaching has dramatically increase in recent years causing a fundamental shift to lesson planning and teaching at all levels of countries. The purpose of this study is to investigate and understand how Malaysian primary English teachers employ AI in designing and implementing lesson plans for students and describe their perceptions of the impact of AI on students. This study responds to a critical research gap by investigating the underexplored experiences of primary level teachers to whom learners' expectations for engaging, scaffolded and contextualised learning are not the same as those of secondary and tertiary educators. Using a qualitative approach, data were gathered from six experienced primary teachers in different Malaysian schools through semi-structured interviews, observations and analysis of AI enhanced lesson plans by using checklist. The results show that teachers use AI most for producing differentiated content within the classroom as well as engaging in creative lesson planning to adapt products to local situations and learner diversity yet emphasise the importance of teacher guided implementation for pedagogical and cultural relevance. Participants reported that it also improves lower proficiency students' engagement, motivation and confidence to learn. It also indicated the importance of continuous professional development of AI literacy. The research highlights opportunities such as better efficiency, equity and more personalisation as well as challenges such as the reliability of AI generated content and the risk of relying too much on them. In conclusion, teacher agency, prompt engineering and reflective practice are the keys to the effective integration of AI in primary English classroom.

Keywords: Artificial Intelligence, perceptions, English, education, teaching English as Second Language

INTRODUCTION

The rapid and widespread adoption of Artificial Intelligence (AI) tools, particularly sophisticated generative language models, marks a crucial turning point in global education (Sallam, 2024; UNESCO, 2023). These technologies are increasingly moving beyond administrative support to fundamentally reshape pedagogical core practices, most notably teacher lesson planning (Gleason, 2022). For the field of English Language Teaching (ELT), lesson planning is the critical point where instructional theory translates into actionable design, dictating the nature of student engagement and language acquisition activities (Wang et al., 2022). This study, titled "Teaching English in the Age of AI: A Qualitative Study of Primary English Teachers' Perceptions" is situated at the nexus of technological innovation and foundational ELT pedagogy.

Despite the transformative potential, the widespread integration of AI creates significant research problems stemming from its novelty and unsupervised uptake. Teachers must now act as critical evaluators, navigating the ethical dilemmas of AI-generated content, verifying output accuracy, and adapting machine-suggested materials to complex classroom realities (Hwang & Tu, 2021). This shift challenges the traditional definition of teacher expertise and raises crucial questions about the genuine impact on student outcomes.

While some studies broadly note AI's use in lesson preparation, there is a pronounced scarcity of research that qualitatively explores the specific, detailed process and rationale by which primary teachers utilise AI to create

concrete instructional resources such as tailored games, differentiated prompts or customised feedback scripts within their daily workflow (Kerr and Kim, 2024). Besides, the majority of qualitative findings on teacher AI use are derived from secondary or higher education settings (Lan and Zhou, 2025). The experiences of Primary English teachers who prioritise foundational literacy, scaffolding and highly engaging activities for young learners are distinctly underexplored. Their unique pedagogical needs with respect to AI warrant specific investigation. Furthermore, although efficiency gains are often cited, the literature lacks rich, descriptive qualitative accounts from teachers regarding the perceived influence of AI-assisted planning on student English language learning outcomes such as shifts in motivation, depth of linguistic understanding or engagement in classroom tasks over the time (Wei, 2023).

Therefore, this research aims to explore the impact of the use of AI in lesson planning towards students' English language learning among English teachers by deeply investigating their utilisation practices, perceived effects on students and the resulting professional challenges and opportunities.

Research Objectives

The research objectives of this study are:

1. To determine how English teachers utilize AI in lesson planning.
2. To explore the perceived impact of using AI in lesson planning among English teachers towards students' English language learning.
3. To identify the challenges and opportunities in using AI for lesson planning among English teachers.

Research Questions

This study will focus on 3 research questions, which are:

1. How do English teachers describe their process of utilizing AI tools to generate and customise instructional materials during their lesson planning?
2. What are English teachers' perceptions regarding the effects of their AI-assisted lesson planning on students' English language learning outcomes?
3. What pedagogical challenges and professional opportunities do English teachers articulate regarding the integration of AI tools into their lesson planning and instructional practice?

LITERATURE REVIEW

Review Studies on the use of AI in lesson planning

A rich sources in recent literature tells the tale of English teachers and their use of AI to develop more efficient and effective lessons. Across contexts, the use of AI tools is said to replace human workers or support three interconnected functions such as the generation and organising of learning resources, alignment with standards and rubrics for assessment as well as informing data planning in order to customise instruction according to learner requirements. AI produces in most cases a number of ‘materials’ options such as reading passage, prompts for discussion, rubrics for writing and the sequences of activities which the teachers have to critically take up, adapt and contextualise in relation to their classrooms. Belloula (2024) and Wang and Li (2024) reported that AI-generated products have the potential to enhance or expand rather than limit the instructional aggregation.

Multiple investigations highlight the contributions of AI to cut through curriculum alignment and providing coherence in unit planning where teachers can track which activities are linked to particular standards and plan instruction that takes into account heterogeneous levels of proficiency (Belloula, 2024; Roslan & Mohamod, 2025). The potential AI in this context relies heavily on teacher skills which include prompting practices, data literacy and critical organising of machine-generated output. Therefore, Tan et al. (2025) and Xiaofan (2025) highlight that focused professional development around AI literacy and ethical use of data arise as a recurring need.

Access and equity issues surface time and with fears about the digital divide defining potential over-dependence on algorithmic decision making in schools that have no governance structures promoting reflective practice and ethical use (Vesna et al., 2025). As a whole, AI is presented as a productive co-planner that can provide planning help with professional knowledge as well as alignment with standards and sustained teacher support for prompts and assessment of responses (Dogan, 2023; Zhang & Tur, 2024).

Review Studies on the Use of AI Tools and Apps in Language Learning

AI's role in language learning can include writing support, speaking and pronunciation practice, reading and listening personalisation as well as scaffolded feedback. In the context of writing, Zhang (2025) mentioned that AI-powered tutoring and automatic feedback can offer immediate scaffolding that may speed up revision cycles and promote development of higher order writing skills especially when combined with explicit instruction and teacher guidance. In the area of speaking and pronunciation, developments in AI-enabled speech recognition functionality combined with adaptive practice tend to contribute to greater accuracy, fluency and learners' confidence particularly if feedback is aligned with the targeted language norms and embedded in communicative tasks (Wei, 2023; Zou et al., 2025).

Moorhouse et al. (2024) and Granström and Oppi (2025) also reported that in reading and listening, AI tools populate texts based on learner interests and ability which have been correlated to increased engagement and emergent comprehension gains. In all of these areas, an emerging agreement is that the effectiveness of AI depends on teacher organising, task design and explicit scaffolding. In other way of saying, teachers serve as organisers and coaches who mediate AI-generated content by guiding students through it to achieve learning goals and standards. Ma and Chen (2025) mentioned that teachers also provide language learners with the human relational context necessary for them to engage with that content. Prior reviews indicate that English teachers usually express positive attitudes towards AI-based English language learning, particularly because it can enhance efficiency, support learners, and create more engaging learning environments (Soh & Yunus, 2023; Zulkarnain & Yunus, 2023). Equity is a driver and source of concern, playing out in differential access to devices and modes of connectivity that will influence the extent to which AI-enhanced language learning can be realised equitably (Kim & Kim, 2022). Significantly, the literature shows that AI can support more accurate and fluent language production when integrated as part of cohesive pedagogies and underpinned by professional development and governance which maintains teacher control over tasks while promoting ethical use (Granström et al., 2025; Wang et al., 2024).

Review of studies on the impact on educational achievement and student engagement

Central goals of AI-mediated ELT are to improve Language Learning and Student Engagement (HESTME) wherein it has been reported that "personalised, interactive AI experiences increase motivation, persistence and positive attitudes toward learning English when feedback is timely and tasks relate to real communicative needs". The language efficacy returns the greatest improvements in writing quality and speaking proficiency when AI feedback is accurate, supportive and embedded into a scaffolded pedagogical sequence that reflects assessment criteria (Wei, 2023) to use as a guide.

Nevertheless, tension that comes from distraction, lack of face-to-face interaction snore quality and too much dependence on automation indicate the necessity for hybrid synthesis to keep all crucial communicative activities and teacher students relationship (Xiaofan, 2025). The efficacy of these increases seems to depend on teacher AI proficiency, the strength of formative assessment loops and institutional support for continued professional development, data governance and technology infrastructure (Kim & Kim, 2022). Equity Factors Equity factors substantially moderate both achievement and engagement with differential access to devices and the web which may be reinforcing or mitigating AI benefits; hence, policy should consider inclusive design along with resource allocation (Kim & Kim, 2022).

Ethical concerns about for example data privacy, transparency and bias have the potential to impact on engagement and achievement, determining how systems are taken up, trusted and governed within classroom practice that span the wide variety of context in which has been tested (Wang et al., 2024).

Technology Pedagogical Content Knowledge (TPACK) Framework

The Technological Pedagogical Content Knowledge (TPACK) framework, first conceptualized by Mishra and Koehler (2006), provides a robust theoretical foundation for understanding how teachers integrate technology effectively into their pedagogy. The framework extends Shulman's (1986) original idea of Pedagogical Content Knowledge (PCK) by incorporating technology as a critical dimension of modern teaching practice. Within the context of English language education, TPACK emphasises the dynamic interaction among technological knowledge (TK), pedagogical knowledge (PK) and content knowledge (CK) that highlight the need for teachers to harmonize all three when designing meaningful, technology enhanced instruction (Koehler et al., 2014).

Recent studies have demonstrated that the TPACK framework is particularly effective in guiding teachers' integration of emerging technologies including artificial intelligence (AI) into classroom instruction (Tan et al., 2025; Ismaniati et al., 2025). Rajandren (2021) found that primary English teachers who adopted TPACK-based approaches were better able to design lessons that fostered engagement and comprehension, particularly when using digital tools to enhance reading instruction. In the Malaysian context, Shafie et al. (2019) reported that teacher education programs focusing on TPACK development improved teachers' technological confidence and creativity hence equipping them to integrate AI based instructional materials in ways that align with both pedagogical goals and curriculum requirements.

In relation to this study, the TPACK framework serves as a conceptual lens for examining how primary English teachers describe their process of utilizing AI tools to generate and customise instructional materials during lesson planning (Research Question 1). Teachers' ability to balance pedagogical intent, linguistic content and the technological affordances of AI such as adaptive worksheets or AI-generated vocabulary games reflects the central tenets of TPACK. By analysing how teachers navigate this interplay, the study seeks to understand the degree of pedagogical reasoning and content alignment underpinning their AI assisted lesson planning practices.

Constructivist Learning Theory

The Constructivist Learning Theory, grounded in the work of Piaget (1972) and Vygotsky (1978), posits that learners actively construct knowledge through social interaction, experience, and reflection rather than passively receiving information. In the context of language learning, constructivism emphasizes the learner's active role in meaning-making, encouraging activities that promote authentic communication, collaboration, and problem-solving (Aljohani, 2017). Within classrooms where AI tools are integrated, constructivist principles are manifested when technology is used to facilitate interactive, student centered experiences such as AI chat simulations, grammar games or adaptive storytelling platforms that prompt learners to co-construct meaning dynamically.

Empirical studies have confirmed the strong link between constructivism and effective technology integration. Zhang and Miao (2025) highlighted that constructivist learning environments foster deeper language acquisition by encouraging exploration and contextualised use of language particularly when supported by digital tools. Similarly, Liu et al. (2024) emphasised that integrating AI and digital technologies into English language teaching allows teachers to create more meaningful learning contexts that encourage collaboration and self-regulated learning. Khasawneh and Belton (2025) also demonstrated that constructivist-oriented English reading lessons enhanced student motivation and comprehension when technology facilitated scaffolded and interactive tasks. These findings suggest that constructivism provides a theoretical basis for understanding teachers' perceptions of the effects of AI-assisted lesson planning on student learning outcomes (Research Question 2).

Furthermore, constructivist perspectives align closely with Research Question 3, which explores the pedagogical challenges and professional opportunities teachers experience when integrating AI tools. Constructivist theory views teaching as a process of continual learning and adaptation, in which teachers act as reflective practitioners who refine their instructional strategies through experimentation and dialogue (Tracy, 2019). Thus, when teachers articulate challenges such as overreliance on AI, content accuracy issues or balancing creativity with automation. They are engaging in the kind of reflective practice that constructivist theory endorses as essential for professional growth.

In sum, both TPACK and Constructivist Learning Theory underpin this study's exploration of AI integration in English language teaching. TPACK informs the structural and cognitive dimensions of how teachers plan and deliver AI assisted lessons while constructivism provides insight into how these practices affect student learning and teacher professional identity within the evolving landscape of AI enhanced education.

METHODOLOGY

Research Design

This study adopted a qualitative research design to explore the lived experiences and perceptions of primary English teachers in integrating artificial intelligence (AI) tools into their lesson planning and instructional practices. A qualitative approach was deemed appropriate because the study sought to gain an in-depth understanding of a complex and emergent educational phenomenon from the participants' own perspectives, rather than to measure or generalize outcomes (Oranga & Matere, 2023).

Besides, this design enabled the researcher to capture how teachers interpreted, negotiated and made sense of their experiences with AI-assisted teaching, as well as the pedagogical, emotional, and professional transformations that accompanied this process. By focusing on subjective meaning-making, the qualitative approach allowed the study to answer the "how" and "what" aspects of the research questions how teachers utilised AI tools in lesson planning, what effects they perceived on student learning, and what challenges and opportunities emerged from their practice (Creswell & Creswell, 2018).

Through this interpretive lens, the study emphasised depth over breadth, valuing rich, detailed descriptions and personal reflections as essential to understanding the realities of AI integration in primary English education.

Participants and Sampling

This study employed a purposive sampling strategy to select a focused and information rich group of participants who met specific inclusion criteria relevant to the research aims. A total of 6 experienced Primary English teachers from 6 different school across Malaysia had been purposefully chosen. The selection criteria required that all participants were currently teaching English at the different primary school level, had prior experience using Artificial Intelligence (AI) tools for lesson planning or instructional material generation and had previously implemented AI generated lesson plans in their classroom teaching.

The purposive sampling approach ensures that each participant possesses firsthand, meaningful experience with AI integration in instructional design that allow the study to obtain in depth insights into teachers' perceptions, processes and pedagogical reflections. This aligns with the principle of information-rich case selection (Palinkas et al., 2015) and supports the qualitative approach which emphasizes depth over breadth of understanding (Tracy, 2019).

Pilot Study

A pilot study was conducted prior to the main data collection to refine the research instruments and ensure their validity and appropriateness for the intended participants. A total of 3 experienced Primary English teachers who had prior experience integrating AI tools into their lesson planning had been purposively selected for the pilot phase. These teachers were not been included in the final study sample.

The pilot study proceeded in several stages. First, the three participants each took part in a semi-structured interview to evaluate the clarity, sequencing and relevance of the interview questions. Their feedback were used to refine question wording and ensure that the interview prompts effectively elicit deep, descriptive narratives aligned with the research questions (Van Teijlingen & Hundley, 2001).

Next, each participant been asked to submit 2 lesson plans that were developed or enhanced using AI tools. The researcher analysed these lesson plans using the Lesson Plan Checklist that is adapted from existing literature to assess the content alignment, pedagogical integration and use of AI-generated instructional materials.

Following this, the participants provided video recordings of the two corresponding lessons that were conducted based on the submitted lesson plans. The researcher reviewed the recorded lessons and prepared fieldnotes using the Classroom Observation Form. To ensure accuracy and credibility, the fieldnotes were returned to the participants for member checking, allowing them to verify that the observational notes accurately reflect what occurred in the recorded lessons.

Finally, the participants been invited for a second follow up interview. During this session, they provided feedback on the interview protocol, the lesson plan checklist and the fieldnote format, particularly regarding their clarity, relevance and comprehensiveness. This iterative process ensures that the instruments are conceptually sound, contextually appropriate and capable of capturing the rich, experiential data necessary for the main study.

Data Collection

To ensure data triangulation and strengthen the credibility and validity of the findings, three qualitative data collection instruments were employed which are semistructured interviews, classroom observations and document analysis. Triangulation allowed the researcher to compare and cross verify evidence from different sources to reduce the limitations of any single method and providing a more comprehensive understanding of the phenomenon under study (Denzin, 2012; Flick, 2022). Data collection continued until theoretical saturation was achieved when no new themes or insights emerged across the instruments (Corbin & Strauss, 2015).

Before the data was collected from the participants, Ethical approval was obtained from the University Kebangsaan Malaysia ethics committee. Then, all participants provided informed consent prior to data collection in order to ask permission to collect the data. All the data collected during this study are not publicly available due to participants confidentiality and ethical restrictions.

In depth semi structured interviews were conducted as the primary instrument to explore the teachers' perceptions, experiences and reflective practices in integrating AI tools into lesson planning and instruction. This method was chosen because it allowed participants to express their thoughts in detail while giving the researcher flexibility to probe deeper into emerging themes. Such an approach was crucial for understanding both the processes and perceptions surrounding AI integration in English language teaching (Tracy, 2019).

Each participant took part in a one-on-one interview session which lasted approximately 45–60 minutes. All interviews were audio recorded with participants' informed consent and transcribed for continuous analysis. The semi structured interview protocol consisted of four main parts and each aligned with specific research objectives. This structured yet flexible interview design allowed the researcher to collect rich, descriptive narratives that directly addressed the study's research questions. The interview data provided insight into not only what teachers did with AI tools but also why they made particular instructional choices, offering a deep understanding of their evolving pedagogical reasoning in the AI-driven educational landscape.

To complement the interviews and verify teachers' reported practices, non-participant classroom observations were carried out during lessons where AI assisted instructional materials were used. The videos were recorded. These observations served to provide contextual validation for Research Questions 1 and 2, focusing on how teachers implemented AI-generated resources and how students responded to them in real classroom contexts.

Each observed lesson was video-recorded with participants' consent to allow detailed post-observation analysis and ensure the accuracy of fieldnotes. The researcher then reviewed the recorded lessons and produced a comprehensive fieldnote for each session. The fieldnote focused on three main dimensions which are instructional implementation (RQ1) which focus on how teachers presented, adapted and scaffolded AI generated materials in their teaching, student engagement (RQ2) on students' behavioural and affective responses such as participation, enthusiasm and interaction with peers and materials and lasty classroom dynamics that focus on lesson flow, management strategies and any technical or pedagogical challenges encountered (Cohen et al., 2017).

To further support triangulation, document analysis was conducted on participants' AI-assisted lesson plans and AI-generated instructional materials such as worksheets, visuals and task prompts. This analysis provided objective evidence of how AI tools were used to support lesson design and resource creation. Each document was

analysed using a Lesson Plan Checklist developed from pedagogical frameworks and relevant literature to evaluate the alignment between learning objectives, AI integration and instructional strategies (Krippendorff, 2019).

The document analysis allowed the researcher to cross check the consistency between what teachers reported in interviews, what was observed in the classroom and what was documented in their lesson plans. This multisource data validation enhanced the trustworthiness and depth of the study (Creswell & Creswell, 2018).

Data Analysis

The collected data were analysed using Thematic Analysis based on the six-phase framework proposed by Braun and Clarke (2006), supported by the qualitative analysis software ATLAS.ti. This method was chosen for its flexibility and systematic approach in identifying, analysing, and reporting recurring patterns of meaning across multiple qualitative data sources. It was particularly suitable for this study which aimed to uncover the perceptions, practices, and experiences of primary English teachers integrating AI tools into their lesson planning and teaching.

The analysis began with the semi structured interview transcripts which served as the primary data source. All interviews were transcribed and repeatedly read to achieve data familiarisation which allow the researcher to immerse fully in the participants' narratives. During initial coding, meaningful excerpts were labelled according to concepts directly related to the research questions, such as "time saving efficiency," "enhanced student engagement," "lesson authenticity," or "AI limitations." The researcher then grouped these initial codes into broader, emerging themes that represented shared experiences or divergent perspectives among teachers. The themes were further reviewed and refined to ensure internal coherence and external distinctiveness and finally defined and named to reflect their conceptual essence in alignment with the study's three research questions. Direct quotations were selected to illustrate key insights and maintain the authenticity of participants' voices in the final report.

In addition to the interviews, the lesson plans provided by participants were analysed using a Lesson Plan Checklist developed from relevant pedagogical and AI integration frameworks. This checklist focused on several dimensions which include lesson objectives, use of AI-generated materials, task alignment, differentiation strategies and student centered design. The analysis aims to determine how AI tools were utilised to generate or customise instructional materials and how effectively these AI-assisted components aligned with the teachers' intended learning outcomes. The document analysis allowed the researcher to verify whether the teachers' described practices in the interviews were consistent with the content and design of their actual lesson plans.

The fieldnotes generated from classroom observations via video recordings were also analysed to provide contextual evidence of how AI generated materials were implemented in real teaching settings. The fieldnotes were first reviewed for descriptive accuracy and then thematically coded to identify recurring patterns in teacher practices and student behaviours. This analysis provided a behavioural and situational perspective that complemented teachers' self-reported data from interviews.

To enhance the trustworthiness and rigor of the analysis, several validation strategies were applied. Member checking was conducted by sharing preliminary themes with participants to verify their accuracy and resonance with lived experiences. Additionally, peer debriefing sessions were held with an experienced qualitative researcher to challenge interpretations to ensure analytical transparency and minimise researcher bias (Lincoln & Guba, 1985). Through these measures, the data analysis achieved credibility, confirmability and dependability to ensure that the findings authentically represented the participants' experiences of teaching English in the age of AI.

FINDINGS

This chapter discusses about the findings on 3 instruments to answer three research questions of this study. Each subsection identifies the key themes that emerged from participants' statements and provides direct quotes as evidence.

How do English teachers utilise AI in their English lesson planning?

a) AI for preparation and materials development

Participants report AI being most utilised in preparation and material generation for the lesson. One participant mentions that AI is applied in the lesson preparation and material in development stage of the lesson plan. This is referring to its involvement in generating teaching materials and reinforced worksheets. This can involve creating examples of paragraphs or worksheets to back up the lesson aims. Another participant mentioned that AI is being used for creating worksheets for various levels and differentiate the students where differentiation and differentiation driven activities are involved with its same content to develop the subject leaning outcomes. Additionally, participants also find that it is efficient for generating a variety of materials rapidly such as differentiated task variants. They stress that it won't be as easy to fully used the products generated by AI to fulfil the context and standard. Hence, and editing and adapting play a particularly important role in making sure the lesson plan generated by AI is useful.

P1: "I primarily utilise AI in the preparation and materials development stages of my lesson planning."

P1: "For example, if the lesson goal is to practice describing animals, I use the AI to help draft the instructional materials such as a sample paragraph or the supporting worksheet (Part B of the lesson)."

P5: "I use AI to generate a reading passage… and then I use it to instantly create three differentiated activities: a vocabulary matching task ,a true/false task with justification and a short opinion writing prompt for different level of students."

The lesson plans conducted by the participants also report that the participants use AI to prepare materials such as worksheets and PowerPoints for their lessons. The use of AI for lesson preparations help them to create exercises for the pupils in a very short time as well as to reduce the mistakes of the worksheet. Based on the lesson plan, the participants also highlight that they use generated AI worksheets that suits different level of students (differentiated learning). For example, the participants used AI to come out with 3 different types of worksheet but with the same content for the same lesson objectives to fulfil students' diversity needs.

b) AI as content generator and idea creator

The role of the AI is perceived by participants as a content generator and idea creator. It is used to create texts such as dialogues, reading passages or stories related to the topics of the lessons as well as for producing sets of questions such as grammar exercises and vocabulary matching. Moreover, AI is also used as a generator of ideas for speaking games or activities. AI is also used by the participants to generate an activity in their context. From the interview, the participants also mentioned that AI helps them to come out with the worksheet whenever they are out of ideas.

P1: "My primary tool is a large language model… for rapid content generation drafting short dialogues, reading passages, or simple stories relevant to Year 3 CEFR themes and for its ability to instantly generate question sets, grammar exercises and vocabulary matching tasks."

P1: "AI is excellent for facilitating language practice because it allows for rapid creation of high volume, contextualized drill materials."

P2: "AI is superb at generating the quantity of content…"

From the lesson plans checklists, they also report that the participants use AI to plan the lessons in order to make the lessons fun and meaningful. This is because only using textbook in teaching might not be efficient and the students get bored. Hence, using AI to create lesson plans provide different fun and meaningful activities for the students in the class.

c) AI for customisation and contextualisation

Participants mention that customisation is essential. They also mention that they do not use AI output but they adapt the content to Malaysian contexts by replacing generic names and places with locally relevant ones and by aligning vocabulary with the specific CEFR level and the Malaysian primary school context. They also adjust task and materials to suit their learners, sometimes transforming a generated prompt into a more appropriate and suitable activity. This customisation shows attention to pedagogical fit and cultural relevance in lesson planning.

> *P1: "Customisation is crucial and non-negotiable. I never use raw AI things.. My edits are primarily focused on contextualisation such as changing generic names or places to Malaysian names and scenarios such as Mei Ling and Ali or roti canai."*

> *P1: "I frequently change the type of task often simplifying a generated prompt into a more appropriate task like draw and label or sentence matching."*

> *P1: "The AI lacks the necessary pedagogical insight into the specific SJKC learner profile and the Malaysian curriculum's nuances."*

Lesson plans also prove that the participants use AI to adapt the materials especially the participants that conduct reading lesson. CEFR textbook sometimes might not suit the context in Malaysia, so they will generate the content by using AI in order to do adaptation that students can relate to their background and prior knowledge.

What are the effects of using AI in lesson planning towards students' English language learning?

a) Differentiation and equity

The data collected highlight that AI supports differentiation by allowing scaffolded materials for all the level of students. In other way of saying is that using AI in lesson planning not only helps the higher proficiency students to achieve the lesson objectives but also for the intermediate and weak students. This promotes equity by giving practices and activities that meets diverse learner needs within the same classroom.

> *P1: "The low-proficiency group has benefited the most because AI enables ultra-scaffolded materials."*

> *P6: "The mid-level students have been most profoundly influence. AI provides the exact bridging materials they need."*

Based on the lesson conducted by P1, the students of different level of proficiency work together as a group. The observation also shows that the activity generated by AI also promote inclusiveness where higher proficiency level of students supported peers when the weak students need help in completing the tasks. P6 also conducted mixed ability groups and it goes well. The students are given the chance to experience different role during the lesson in order to provide opportunity to each and every one of the students.

b) Student outcomes in speaking, reading and writing skills

Participants report that students show improvements in reading skill through contextualised reading materials that is generated by AI. Besides, the participants also mention that using AI in lesson planning help students in their speaking skill with the help of speaking prompts. For upper primary students that is Year 4 to year 6 students, improvements in writing and reading comprehension can be seen through students' products when AI-generated writing prompts and sample of models are used for writing essay or used as assessment tasks. The effects are not clearly shown by the lower primary school students however it also benefits those higher proficiency students from the availability of higher level extension materials.

> *P1: "Reading practice has increased student confidence in tackling longer texts."*

> *P3: "Speaking practice quantity increased due to varied and theme-specific role-play prompts."*

> *P2: "In Year 6, writing and reading comprehension show notable improvements due to targeted prompts and model texts."*

Improvement on student's writing skill can be seen from the lesson conducted by P6 where students are able to write a short job description by given a short exemplar text that was generated by AI before the students begin to write. This particular participant also use the sentence frames generated by AI in order to help the weaker students to write. At the end of the lesson, all the students achieve the lesson objectives by writing a simple job description with the help of the AI generated materials.

c) Students' engagement and motivation

All the participants report that the materials and activities generated by AI help the students to engage more in learning English. This can help them students to improve their motivation as well as having fun learning in the class. When the students actively participate in the class, the students will learn as well as achieve the learning objectives.

P5: When the practice is relevant and immediately communicative, students are more engaged.

P4: The AI gives you the materials. you give the children the motivation.

This can also be supported by the classroom observation from all the participants. All of the 6 observations from 6 participants show that the use of AI to generate activities in lesson plan for students can attract students' attention in participating in the lesson. Some of the students are eager to participate in group discussion although they have lower proficiency in English. Through the group discussion, it can also be seen that all of the students took their own role in contributing their ideas and work in order to complete the tasks given by the teacher. Another classroom observation for P6 when conducting lesson in the class shows that the students' interest are higher during interview tasks and gallery sharing. This proves that students are enjoying themselves in the activities designed by AI.

d) Encourage confidence and learning quality

Based on the data collected from the interview, AI-generated CEFR-aligned materials that are more engaging, relevant and consistent in quality believe to enhance student learning. Participants report that the materials produced are more engaging and aligned with CEFR standards which is linked to improve student engagement and learning experiences.

P5: "AI assisted planning ensures the learning is consistent, highly visual and repetitive."

P3: "The increased capacity for personalized practice allows all Year 6 students to achieve the targeted level and feel confident."

This can also be seen from the classroom observation by P3 where the weak students that are still developing confidence in English remained focus with the help of visual aids generated by AI to keep the students. Group work also promotes confidence and overcome students' hesitancy. The lessons conducted by P1, P3, P4, P5 and P6 that conducted group work activity in the class believe that students that are shy to use English in the class or afraid of making mistakes tend to do sharing and giving opinions when they come in a smaller group with the guidance from other friends.

What challenges and opportunities do English teachers face regarding AI tools for lesson planning?

a) Opportunities

This trend of making content more personalised by using AI provides a great chance for teachers. They can make a lot of different kind of materials that suit what all students need. The main advantage commonly mentioned is time saved which gives opportunities to teachers to participate in the most effective pedagogical activities, design better interactive exercises or offer more individual feedback. Improved consistency in CEFR alignment and the possibility of wider distribution of high quality differentiated coaching materials across schools are both benefits of the new approach.

P1: "The main opportunity has been hyper personalisation of content."

P2: "Significant time saving, freeing up to focus on higher impact pedagogical tasks."

P5: "A major opportunity is the democratisation of visual resource creation and the ability to generate visuals instantly."

P6: "Potential benefits include enhanced creativity, consistency in CEFR alignment and greater accessibility for teachers."

Besides, teachers say that they are moving into new roles as with their students, teachers-guide and promoter. The required competencies shift brings many new skills such as designing prompts, assessing content and considering morals. However, collaboration to develop shared templates or best practices is generally seen as a helpful form of support.

b) Challenges

The products generated by using AI are not fully reliable nor accurate and need to be reviewed and manually edited a lot. The issue of specific and detailed prompting to ensure that products are appropriate for the Malaysian CEFR context is a repeated concern. Hence, adaptation and edition have to be done at all time in order to suit the students' level, needs and content and lesson objectives, The participants also report having AI in lesson planning is convenient but sometimes AI hardly get to know what do the participants need in their lesson plans.

P1: "Reliability and accuracy of the products. Output often requires intensive editing."

P4: "Very specific and detailed prompting is required to align with Malaysian CEFR levels."

Next, privacy, data security and assessment integrity issues are also salient especially in higher stakes settings. Barriers are discussed including lack of school policies and need for continued professional development.

P2: "Lack of clear school policies and need for self-initiated professional development."

AI-based planning can help promote equity by offering personalised, high-quality practice. However, there are worries about overdependence on AI created content and the potential for decontextualisation or copying if it is not used with caution. This cause the centrality of teacher judgment in the provision of culturally relevant and authentic learning experiences continues.

P2: "High-achievers benefit from extension materials; risk of over-dependence on AI-produced content."

Furthermore, AI generated planning can be used to advance equity by providing differentiated practice but it further risks expanding inconsistency if not carefully coordinated. It might leads to negative effects towards students' outcomes.

P5: "AI supports equitable access to high quality differentiated resources."

DISCUSSION

Ways English teachers utilise AI in their English lesson planning

English teachers described a highly iterative and collaborative process in this study whilst using AI tools to produce and personalise instructional materials. The process usually started with teachers entering lesson objectives, target language skills and contextual requirements into AI tools like ChatGPT, Canva or individual lesson planning tools. AI was often used by teachers as they prepared initial lesson outlines to produce draft material such as reading passages, grammar exercises, vocabulary lists, and interactive activities (Del Valle, 2024; Moorhouse et al., 2024). This is consistent with the previous study where AI tools are usually used for fast content generation so that teachers can work around the "blank page" effect and produce diverse materials in just

a fraction of the time required for doing things manually (Del Valle, 2024).

However, teachers repeatedly said that AI produced content was harldy utilised. Rather, they presented a critical review and modification process involving examining, refining and contextualising AI outputs to keep them consistent with curriculum standards, student proficiency levels and local cultural references. For instance, the teachers substituted generic names and scenarios for those designed in Malaysian contexts, modified vocabulary terms to fit in with the CEFR descriptors and turned abstract prompts into age appropriate actions such as draw-and-label or matching activities (De Vina, 2025; Uchida, 2025). This practice reflects the increasing recognition that AI should be regarded as a collaborative partner rather than an AI replacement for teacher expertise with teachers serving as curators and designers who synthesise AI outputs according to pedagogical and contextual demands (Moorhouse, 2025; Almegren, 2025).

Customisation was especially critical to assure that AI generated materials were. At the same time,they also make sure that the materials are linguistically and culturally relevant. Raw AI outputs were often accompanied by irrelevant or decontextualised content that teachers noted could lead students to feel that they were reading the words of a foreign teacher rather than being able to relate how they were taught, whether as an educator or otherwise (Zheng & Stewart, 2024). Engaging students through localising and personalising AI-generated materials was a critical step in helping a teacher create relevant lessons to reflect their real world experiences and learning needs, achieving higher engagement and learning outcomes. This line corresponds with studies that indicate meaningful learning requires culturally and linguistically appropriate tasks, with the role of teachers acting as an intermediary between the AI outputs in sustaining authenticity while also maintaining learner identification (Alamri, 2025; Hossain, 2024).

Teachers also highlighted the need for prompt engineering in AI assisted planning through the lesson. They wrote about creating specific, concise prompts to direct the AI tools in producing materials that were aligned with their intended lesson content and student profiles. This ability was identified as crucial to make sure that AI content was aligned with specific curricula and learner needs as well as that generic or misaligned materials would not come out (Kerr & Kim, 2025). With educators also being asked to discover new capabilities in recent years, the necessity for prompt engineering demonstrates how professional life shifts with the changing landscape of AI teacher and learning communities and that if teachers do not possess new skills they will not be able to leverage generative technologies to the maximum.

The effects of using AI in lesson planning towards students' English language learning

Teachers in this study reported various positive effects of AI assisted lesson planning for their own English language learners as a means of enhancing learning outcomes. The four biggest contributors in this study were promoting differentiation, higher motivation, enhanced confidence and more frequent opportunities for practice. Teachers reported that AI-guided learning solutions helped them devise different levels of tasks around the same subject matter so that students of different proficiency would get more equal opportunities to attain a better level of content (Jong et al., 2025). That is consistent with studies which found that AI could contribute to differentiated instruction by producing tiered resources and adaptive exercises to fit the needs of differentiated instruction (Ruslim & Khalid, 2024; Jingyi & Pamintuan, 2024).

The application of AI-generated materials was also related to more motivation and engagement in students. These activities were associated with students' higher willingness to engage in group discussions and related AI mediated activities as well as described the relevance and immediacy of the practice task as major motivators. Quantitative studies provide evidence that AI tools such as Duolingo and automated writing platforms can enhance a variety of foreign language satisfaction, involvement and motivation in comparison to traditional methods (Yuan & Liu, 2025; Xiaofan, 2025). The interactive, gamified and individualised atmosphere of AI contexts was highlighted for the ability to effectively reduce anxiety and foster sustained effort in learning a language (Alonzo et al., 2024; Yuan & Liu, 2025).

Teachers also observed gains in reading confidence, chances of speaking and writing particularly in higher primary students. They used AI-produced exemplars and sentence frames to scaffold writing tasks that allowed students to better internalise the structure and patterns of a given style for writing by comparison to using

unguided drafting (Wei et al., 2023; Tai et al., 2025). This aligns with studies showing the ability of modelling based scaffolding to improve vocabulary, grammar correctness and organisation in writing for EFL learners (Yuan & Liu, 2025; Aldosemani et al., 2023). However, teachers noticed that the benefits were more marked among greater or upper primary learners, indicating that young or very low-proficiency individuals might need even more scaffolding to benefit fully from AI supported materials (Wang et al., 2025).

The theme of enhanced learner confidence particularly for learners who were previously hesitant or had been less confident was also emphasised. Teachers indicated that AI aided scaffolding and images made the classroom accessible and helped them develop a more encouraging and supportive learning environment and decreased the risk of failure in the learning process of language skills. This is consistent with research based on Self Determination Theory that suggest AI tools can promote autonomy, competence and relatedness through providing choice, tailored challenge and collaborative tasks (Yuan & Liu). Lastly, teachers noted that AI could generate extensive amounts of targeted practice items, increasing opportunities for rehearsal across skills at scale. Such findings are consistent with the use of AI-based systems to create customised practice sets which draw on learner performance data and yield multiple samples at relative levels of difficulty as needed to close certain voids (Dekhakhena, 2025; Tan et al., 2025). AI applications in personalised learning tools show that personalised practice can enhance academic performance and perception of learning outcomes when students receive timely feedback in the form of personalised tasks (Kwak, 2025; Hasin et al., 2025).

Challenges and opportunities that English teachers face regarding AI tools for lesson planning

When integrating AI tools into lesson planning and pedagogical practice, the use of AI tools for teaching English both provides great opportunities and challenges. In the present paper, teachers discussed various professional goals such as efficiency, personalisation, visual resource creation and curriculum aligned work that they would gain. AI tools were perceived as important in terms of optimising lesson planning, assessment design and preparation of materials that allow teachers to focus on higher-level pedagogical efforts such as feedback, differentiation and student mentoring (Tan et al., 2025; Ilma & Rohman, 2025). These findings are consistent with the wider literature showing that AI can alleviate teacher burden, improve lesson quality and increase student engagement, liberating teachers to perform higher-impact creative and critical tasks (Belloula, 2025; Tan et al., 2025).

Teachers also pointed out that due to machines, AI can be harnessed to help in hyper personalisation of content so that teachers make lesson plans that meet the variety needs and interest levels of all their students. This also includes the potential for it to form tiered resources, adaptive exercises and interactive exercises in such learning profiles as tiered materials in line with their own learning profile (Xiaofan, 2025). Visual resources generation through AI were also considered advantageous, given that teachers stated that AI devices could generate images, videos and multimedia resources with very little time that promote comprehension and involvement (Jong et al., 2025).

Nevertheless, with this challenge, teachers also suggested several pedagogical issues posed by AI incorporation. The biggest concerns expressed by teachers were AI generated content is unreliable and doesn't accurately report what's happening. There is a need for plenty of editing and context in order to include context in the content generated and the danger of falling too far into technological dependency. Teachers observed that AI results contained factual inaccuracies, nonsensical vocabulary or content level misalignment, necessitating critical reflection and rework. This is consistent with research suggesting that the capacity to develop and apply prompt engineering skills is critical in the process of incorporating AI to the specific curricula and learner profiles (Kerr & Kim, 2025).

Concerns for privacy, security of data and assessment quality were also considerable. There were vague school policies around practices around teachers' use of educational technologies, which teachers reported themselves working with for self-initiated and individualised professional development to navigate this ambiguity leading to inconsistent practices and an uncertain usage (Xiaofan, 2025). This shows an urgent need for system level frameworks and targeted professional development to advance safe and pedagogically sound integration of AI or using AI for lesson planning.

Teachers also expressed the dangers of excessive AI dependency to decrease independent idea generation and use of critical language if outputs are not actively mediated (Bashiri & Ebadi, 2025). There were also fears that the development of AI would further worsen the gaps between students with strong digital skills or infrastructure and those without potentially worsen existing inequities (He et al., 2025). All these can be supported by the previous studies that highlight persistent challenges such as teachers limited technological skills, infrastructure issues and concerns about over-reliance on AI and reduced human interaction (Soh & Yunus, 2023; Zulkarnain & Yunus, 2023). In light of these factors, teachers stressed the need for ethical and pedagogical frameworks, ongoing professional development and collaborative communities of practice that establish localised AI-pedagogical norms rather than simply a process run off the back of a vendor guideline (Xiaofan, 2025).

CONCLUSION

This qualitative study investigated how primary English teachers from Malaysia are utilising AI tools in lesson planning. Results indicated that teachers extensively utilize AI to create and individualise teaching materials, promoting fast generation of differentiated tasks and encouraging exciting, contextualised tasks for the variety of learners involved. This promotes better lesson preparation and improved materials' alignment with curriculum standards which also supports personalisation based on the skill levels of the students. It has become the case that lessons using AI-generated content and have produced better results especially for lower proficiency classes. Teachers who engage with the evidence and make teaching observations and reflections on AI use in teaching and learning have demonstrated that the students who are supported by it are more motivated, engaged and confident when classes and content are more AI generated.

Indeed, instructors repeatedly remind to adapt AI outputs because these unedited materials rarely fit the realities of specific curricular or cultural contexts. The importance of continual professional development in AI literacy and ethical reflection is also underlined for teachers which is to be able to critically assess AI-generated resources to ensure equitable access of AI-generated resources to all who find themselves. Overreliance on technology, potential biases and the challenge for preserving pedagogical quality suggest AI should be seen more as an enabler not a substitute for teacher understanding and creativity.

The limitations of this study being a representative sample of a small, geographically focused group of primary English teachers may impact generalisation of the results to other educational settings and contexts. The use of teacher self-reports and qualitative interviewing may have introduced some bias or some partial perspectives and the Malaysian primary education practices as well as the cultural practices of teaching in Malaysian primary education may not be universally applicable. Additionally, since AI integration into lesson preparation and delivery is an emerging phenomenon, the long-term influence of AI integration on student learning results will need to be studied for both long run in this domain.

Implications from this research, suggestions for future research include the investigation to further consider broadening the study population to include a larger and more heterogeneous population of teachers across education settings and levels of education. Longitudinal research is required in order to determine whether AI integration of integrated approach can still produce sustained effects on teaching practice and school educational practices or on student learning achievement. In future work, quantitative measures of both student achievement and engagement should be included to look more closely at particular AI tools and focus on developing effective professional training for teachers about AI literacy.

REFERENCES

1. Alamri, W. (2025, August). Evaluating the benefits and challenges of using authentic materials in EFL context for listening purpose. In *Frontiers in Education* (Vol. 10, p. 1611308). Frontiers. https://doi.org/10.3389/feduc.2025.1611308
2. Aldosemani, T. I., Assalahi, H., Lhothali, A., & Albsisi, M. (2023). Automated writing evaluation in EFL contexts: A review of effectiveness, impact, and pedagogical implications. *International Journal of Computer-Assisted Language Learning and Teaching (IJCALLT)*, *13*(1), 1-19. https://doi.org/10.4018/IJCALLT.329962

3. Aljohani, M. (2017). Principles of "constructivism" in foreign language teaching. *Journal of Literature and Art Studies*, 7(1), 97-107. DOI: 10.17265/2159-5836/2017.01.013
4. Almegren, A. (2025). AI-powered ELT: Instructors' transformative roles in AI-powered learning environments. PLOS ONE, 20(5), e0324910. https://doi.org/10.1371/journal.pone.0324910
5. Alonzo, D., Abril, J. M. V., & Oo, C. Z. (2024). The use of artificial intelligence in English language assessment: Empirical evidence and future directions. *Available at SSRN 4695394*. DOI:10.2139/ssrn.4695394
6. Belloula, S. (2025). Empowering educators: Leveraging AI to revolutionize lesson planning. *International Journal of Research in Education and Science (IJRES)*, 11(2), 264-280. https://doi.org/10.46328/ijres.1295
7. Cohen, L., Manion, L., & Morrison, K. (2017). *Research methods in education* (8th ed.). Routledge.
8. Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa
9. Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Sage Publications.
10. Del Valle, J. M. (2024). Use of generative AI in writing lesson plans: The case of English pre-service teachers. *International Journal of Social Science, Humanity & Management Researchers*, 4(7), 12–25. https://ijsshmr.com/v4i7/2.php
11. Dekhakhena, A. (2025). AI-Powered Personalized Learning in EFL Acquisition: Exploring Adaptive Instruction and Feedback Systems. *Journal of Studies in Language, Culture and Society (JSLCS)*, *8*(1), 111-131.
12. Denzin, N. K. (2012). Triangulation 2.0. *Journal of Mixed Methods Research*, 6, 80-88. https://doi.org/10.1177/1558689812437186
13. De Vina, A. P. R. (2025). Using AI to integrate local legends into language lessons in West Kalimantan. Wanastra English Journal, 13(1), 45–60. DOI: 10.31943/wej.v9i1.342
14. Dogan, S. (2025). A Human-AI Hybrid Co-Design Model: Planning Effective Instruction with ChatGPT. *Asian Journal of Distance Education*, *20*(1). Retrieved from http://asianjde.com/ojs/index.php/AsianJDE/article/view/818
15. Flick, U. (2022). Revitalising triangulation for designing multi-perspective qualitative research. In U. Flick (Ed.) *Revitalising triangulation for designing multi-perspective qualitative research* (Vol. 2, pp. 652-664). SAGE Publications Ltd. https://doi.org/10.4135/9781529770278.n40
16. Granström, M., & Oppi, P. (2025). Student engagement with AI tools in learning: Evidence from a large-scale Estonian survey. *Frontiers in Education*, *10*, 1688092. https://doi.org/10.3389/feduc.2025.1688092
17. Hasin, H., Mahat, Z., Jamil, A., Mohd Sehat, R., & Fauzihardani, E. (2025). The Role of AI-Assisted Learning Tools in Personalized Learning and Adaptive Education. *Information Management and Business Review*, *17*(1(I)S), 314-324. Retrieved from https://ojs.amhinternational.com/index.php/imbr/article/view/4413
18. He, M., Abbasi, B.N. & He, J. (2025). AI-driven language learning in higher education: an empirical study on self-reflection, creativity, anxiety, and emotional resilience in EFL learners. *Humanit Soc Sci Commun* 12, 1525. https://doi.org/10.1057/s41599-025-05817-5
19. Hossain, K. I. (2024). Reviewing the role of culture in English language learning: Challenges and opportunities for educators. *Social Sciences & Humanities Open*, *9*, 100781. https://doi.org/10.1016/j.ssaho.2023.100781
20. Hwang, G., & Tu, Y. (2021). Roles and research trends of artificial intelligence in mathematics education: A bibliometric mapping analysis and systematic review. *Creative Education*, 12(12), 2849-2865. https://doi.org/10.3390/math9060584
21. Ilma, A., & Rohmah, Z. (2025). AI in EFL education: teachers' competence and the roadblocks to teaching material development. *Cogent Education*, *12*(1). https://doi.org/10.1080/2331186X.2025.2588471
22. Ismaniati, C., Khairaty, N. I., Yusuf, N., & Supramono, A. (2025). Harnessing self-efficacy: Mediating the connection between TPACK and AI intentions among teachers. *Journal of Pedagogical Research*, 9(2), 109-126.

23. Jingyi, X., & Pamintuan, C. (2024). Intelligent Enhancements in Differentiated Language Education: A Case Study Focused on Learner Needs. *SAGE Open*, *14*(4), 21582440241287585. https://doi.org/10.1177/21582440241287585
24. Jong, M., Ruzaini, A., Thulasy, S., Ravi, D. M., Munirah, W. A., Yunus, M. M., ... & Salehi, H. (2025). Leveraging Artificial Intelligence (AI) to Enhance Differentiated Learning Strategies in Malaysian ESL Learners: A Conceptual Paper. *ASEAN Artificial Intelligence Journal*, *2*(1), 1-18. https://doi.org/10.37934/aaij.2.1.118
25. Khasawneh, M. A. S., & Belton, B. (2025). Disclosing the effects of automated feedback on reading comprehension, reading motivation, reading engagement, and reading anxiety through personalized technology-enhanced learning. *Computers in Human Behavior Reports*, 20, 100817. https://doi.org/10.1016/j.chbr.2025.100817
26. Kerr, Robert C. & Kim, Hyekyeng. (2025). From Prompts to Plans: A Case Study of Pre-Service EFL Teachers' Use of Generative AI for Lesson Planning From Prompts to Plans: A Case Study of Pre-Service EFL Teachers' Use of Generative AI for Lesson Planning. *English Teaching*. 80. 95-118. 10.15858/engtea.80.1.202503.95.
27. Kim, N. J., & Kim, Y. (2022). Teacher perceptions and challenges of AI-enhanced scaffolding systems in STEM education. *Frontiers in Education*, 7, 823. DOI: 10.3389/feduc.2022.00823
28. Koehler, M. J., Mishra, P., Kereluik, K., Shin, T. S., & Graham, C. R. (2014). The Technological Pedagogical Content Knowledge Framework. In J. M. Spector et al. (Eds.), Handbook of Research on Educational Communications and Technology (pp. 101-111). *Springer*. https://doi.org/10.1007/978-1-4614-3185-5_9
29. Krippendorff, K. (2019). Content analysis. SAGE Publications, Inc., https://doi.org/10.4135/9781071878781
30. Kwak, M. (2025). The Effectiveness of AI-Driven Tools in Improving Student Learning Outcomes Compared to Traditional Methods. *Issues in Information Systems*, *26*(4), 233-247. https://doi.org/10.48009/4_iis_2025_120
31. Lan, M., Zhou, X. (2025). A qualitative systematic review on AI empowered self-regulated learning in higher education. *npj Sci. Learn*. 10, 21. https://doi.org/10.1038/s41539-025-00319-0
32. Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Sage Publications.
33. Liu, Y., Thurston, A., & Ye, X. (2024). Technology-enhanced cooperative language learning: A systematic review. *International Journal of Educational Research*, 124, 102314. https://doi.org/10.1016/j.ijer.2024.102314
34. Mishra, P., & Koehler, M. J. (2006). Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge. *Teachers College Record, 108(6),* 1017–1054. https://doi.org/10.1111/j.1467-9620.2006.00684.x
35. Moorhouse, B. L., Wan, Y., Wu, C., Kohnke, L., Ho, T. Y., & Kwong, T. (2024). Developing language teachers' professional generative AI competence: An intervention study in an initial language teacher education course. *System*, *125*, 103399. https://doi.org/10.1016/j.system.2024.103399
36. Nurin Hanisah Roslan, Zamri Mahamod (2025). The Use of Artificial Intelligence (AI) in Planning Differentiated Learning for Malay Language Teaching and Learning. *International Journal of Research and Innovation in Social Science (IJRISS*), 9(03), 5989-6013. https://doi.org/https://dx.doi.org/10.47772/IJRISS.2025.903SEDU0432
37. Oranga, J., & Matere, A. (2023). Qualitative research: Essence, types and advantages. *Open Access Library Journal*, *10*(12), 1-9. DOI: 10.4236/oalib.1111001
38. Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and Policy in Mental Health and Mental Health Services Research*, *42*(5), 533–544. https://doi.org/10.1007/s10488-013-0528-y
39. Piaget, J. (1972). Intellectual Evolution from Adolescence to Adulthood. *Human Development*, 15, 1-12. http://dx.doi.org/10.1159/000271225
40. Rajandren, L. R. (2021). *Exploring TPACK Competencies of Primary School Teachers in ESL Classroom* (Doctoral dissertation, Universiti Teknologi Malaysia). http://eprints.utm.my/102558/1/LalithaRajRajandrenMSP2021.pdf.pdf

41. Ruslim, M. I., & Khalid, F. (2024). The use of artificial intelligence in differentiated instruction classrooms. *International Journal of Academic Research in Business & Social Sciences*, *14*(8), 682-697. http://dx.doi.org/10.6007/IJARBSS/v14-i8/22435
42. Sallam, M. (2024). ChatGPT usage and attitudes are driven by perceptions of the educational benefits of generative AI. *Frontiers in Education*, 9, Article 1414758. https://doi.org/10.3389/feduc.2024.1414758
43. Shafie, H., Majid, F. A., & Ismail, I. S. (2019). Technological pedagogical content knowledge (TPACK) in teaching 21st century skills in the 21st century classroom. *Asian Journal of University Education*, 15(3), 24-33. DOI:10.24191/ajue.v15i3.7818
44. Shulman, L.S. (1986) Those Who Understand: Knowledge Growth in Teaching. *Educational Researcher*, 15, 4-14. http://dx.doi.org/10.3102/0013189X015002004
45. Tai, H. Y., Lin, M. F., & Chen, Y. S. (2025). Incorporating ChatGPT Into Genre-Based Instruction for Argumentative Writing Among EFL College Students. *International Journal of Applied Linguistics*, e12777. https://doi.org/10.1111/ijal.12777
46. Tan, L. Y., Hu, S., Yeo, D. J., & Cheong, K. H. (2025). Artificial Intelligence-Enabled Adaptive Learning Platforms: A Review. *Computers and Education: Artificial Intelligence*, 100429. https://doi.org/10.1016/j.caeai.2025.100429
47. Tan, S. C., Tan, Y. Y., Teo, C. L., & Yuan, G. (2025). Teachers' professional agency in learning with AI: A case study of a generative AI-based knowledge building learning companion for teachers. *British Journal of Educational Technology*. https://doi.org/10.1111/bjet.70013
48. Tan, X., Cheng, G., & Ling, M. H. (2025). Artificial intelligence in teaching and teacher professional development: A systematic review. *Computers and Education: Artificial Intelligence*, *8*, 100355. https://doi.org/10.1016/j.caeai.2024.100355
49. Tan, X., Cheng, G., & Ling, M. H. (2025). Investigating the mediating role of TPACK on teachers' AI competency and their teaching performance in higher education. *Computers and Education: Artificial Intelligence*, 100461. https://doi.org/10.1016/j.caeai.2025.100461
50. Tracy, S. J. (2019). *Qualitative research methods: Collecting evidence, crafting analysis, communicating impact* (2nd ed.). Wiley-Blackwell.
51. Uchida, S. (2025). Generative AI and CEFR levels: Evaluating the accuracy of text generation with ChatGPT-4o through textual features. Journal of Computer Assisted Language Learning and Teaching, 15(1), 1–22. https://doi.org/10.29140/vli.v14n1.2078
52. Van Teijlingen, E., & Hundley, V. (2001). The importance of pilot studies. *Social Research Update*, *35*(1), 1–4.
53. Vesna, L., Sawale, P. S., Kaul, P., Pal, S., & Murthy, B. S. N. V. R. (2025). Digital divide in AI-powered education: Challenges and solutions for equitable learning. *Journal of Information Systems Engineering and Management*, 10(21), 300-308.
54. Vygotsky, L. S. (1978). Mind in Society: The Development of Higher Psychological Processes. *Cambridge, MA: Harvard University Press*.
55. Wang, F., Zhou, X., Li, K., Cheung, A. C. K., & Tian, M. (2025). The effects of artificial intelligence-based interactive scaffolding on secondary students' speaking performance, goal setting, self-evaluation, and motivation in informal digital learning of English. *Interactive Learning Environments*, *33*(7), 4633–4652. https://doi.org/10.1080/10494820.2025.2470319
56. Wang, W., & Li, Y. Z. (2024). International Generative Artificial Intelligence Education Application and Provincial Thinking. *Open Education Research, 30*, 37-44.
57. Wei, L. (2023). Artificial intelligence in language instruction: Impact on English learning achievement, L2 motivation, and self-regulated learning. *Frontiers in Psychology*. https://doi.org/10.3389/fpsyg.2023.1261955
58. Wei, P., Wang, X., & Dong, H. (2023). The impact of automated writing evaluation on second language writing skills of Chinese EFL learners: A randomized controlled trial. *Frontiers in Psychology*, *14*, 1249991. https://doi.org/10.3389/fpsyg.2023.1249991
59. Xiaofan, W. (2025). Investigating the use of AI tools in English language learning. *Contemporary Educational Technology*, 17(2), ep578. DOI: 10.30935/cet.ep578
60. Xuan, S. Y., & Yunus, M. M. (2023). Teachers' attitude towards the use of Artificial Intelligence-based English language learning: A mini review. *International Journal of Academic Research in Business & Social Sciences*, *13*(5), 793-800. http://dx.doi.org/10.6007/IJARBSS/v13-i5/16459

61. Yuan, L. J. & Liu. X. J. (2025). The effect of artificial intelligence tools on EFL learners' engagement, enjoyment, and motivation. Computers in Human Behaviour, 162, 108474. https://doi.org/10.1016/j.chb.2024.108474
62. Zhang, K. (2025). Enhancing Critical Writing Through AI Feedback: A Randomized Control Study. *Behavioral Sciences*, *15*(5), 600. https://doi.org/10.3390/bs15050600
63. Zhang, P., & Tur, G. (2024). A systematic review of ChatGPT use in K-12 education. *European Journal of Education*, *59*(2), e12599. https://doi.org/10.1111/ejed.12599
64. Zhang, Y., & Miao, Z. (2025). Enhancing EFL Learners' Engagement and Motivation Through Immersive Technologies: The Role of Artificial Intelligence, Augmented Reality, Virtual Reality, and Mobile Applications. *European Journal of Education*, 60(2), e70128.
65. Zheng, Y. D., & Stewart, N. (2024). Improving EFL students' cultural awareness: Reframing moral dilemmatic stories with ChatGPT. *Computers and Education: Artificial Intelligence*, *6*, 100223. https://doi.org/10.1016/j.caeai.2024.100223
66. Zou, B., Liviero, S., Ma, Q., Zhang, W., Du, Y., & Xing, P. (2024). Exploring EFL learners' perceived promise and limitations of using an artificial intelligence speech evaluation system for speaking practice. *System*, *126*, 103497. DOI:10.1016/j.system.2024.103497
67. Zulkarnain, N. S., & Yunus, M. M. (2023). Primary teachers' perspectives on using artificial intelligence technology in English as a second language teaching and learning: A systematic review. *International Journal of Academic Research in Progressive Education and Development*, 12(2), 861-875. http://dx.doi.org/10.6007/IJARPED/v12-i2/17119