AI-SUPPORTED VOCABULARY LEARNING IN PRIMARY ENGLISH CLASSROOMS: PEDAGOGICAL OPPORTUNITIES AND CHALLENGES

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Abstract

The integration of artificial intelligence (AI) and digital technologies into English language teaching has created new opportunities for supporting vocabulary development among young learners. Primary school pupils benefit from learning environments that combine visual materials, repetition, interaction, and meaningful language use. AI-supported tools can assist teachers in preparing differentiated vocabulary activities, generating age-appropriate examples, and designing interactive learning materials. However, their educational value depends on pedagogical planning, teacher supervision, accessibility, and the protection of children's privacy. This paper examines the potential benefits and limitations of AI-supported vocabulary learning in primary English classrooms. Drawing on relevant literature and international guidance, it proposes practical strategies for integrating AI-generated materials into vocabulary instruction. It argues that AI should complement, rather than replace, teacher-led instruction and interpersonal communication.

Keywords: artificial intelligence, English language teaching, primary education, vocabulary acquisition, digital technologies, young learners

Introduction

English language learning at the primary level provides a foundation for pupils' future communicative competence. At this stage, vocabulary acquisition is particularly important because learners need a growing repertoire of words to understand classroom instructions, describe familiar objects, express preferences, and participate in simple conversations. Vocabulary instruction should therefore extend beyond memorising isolated words and encourage learners to recognise, understand, pronounce, and use vocabulary in meaningful contexts.

Digital technologies have introduced additional possibilities for supporting this process. Images, animations, audio recordings, educational games, and interactive quizzes can create multimodal learning experiences. More recently, artificial intelligence has expanded the range of resources available to teachers by enabling them to draft vocabulary exercises, adapt texts to different proficiency levels, and develop contextualised examples.

Nevertheless, technological innovation does not automatically guarantee better learning outcomes. Effective integration requires teachers to select appropriate tools, establish clear learning objectives, and ensure that digital activities support rather than distract from language learning. UNESCO (2023) emphasises a human-centred approach to generative AI in education, including attention to privacy, age appropriateness, inclusion, and human agency. The purpose of this paper is to examine the pedagogical opportunities and challenges of integrating AI-supported digital technologies into vocabulary teaching in primary English classrooms and to suggest practical strategies for responsible use.

Digital Technologies and Vocabulary Learning

Vocabulary knowledge involves more than recognising a word. Learners gradually develop knowledge of its meaning, pronunciation, spelling, grammatical behaviour, and appropriate use in context. For young learners, vocabulary activities are often more meaningful when words are connected to familiar experiences, visual representations, physical actions, and communicative purposes.

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Technology-based resources can support classroom activities involving listening, speaking, visual recognition, and storytelling. For example, a teacher introducing animals may use images and audio to help pupils connect a word's written form with its meaning and pronunciation. AI-supported tools can extend this process by helping teachers draft simple descriptions, matching exercises, short dialogues, and differentiated practice tasks.

It is important, however, to distinguish between technology as a delivery mechanism and technology as a pedagogical resource. The value of a digital activity depends not simply on the presence of AI but on how the teacher integrates it into a coherent instructional sequence. Technology should support meaningful practice, retrieval, feedback, and communication rather than merely place conventional worksheets on a screen.

Pedagogical Opportunities of AI-Supported Vocabulary Learning

Personalisation and differentiated instruction

One potential advantage of AI is its capacity to assist teachers in preparing alternative versions of learning materials. In a

primary classroom, pupils may differ in vocabulary knowledge, reading ability, confidence, and learning pace. AI tools can help teachers create activities at different levels while retaining a shared learning objective. For example, in a lesson on food, beginning learners may match pictures to words such as "apple," "bread," and "milk." More confident pupils may complete sentence frames such as "I like eating apples," while advanced learners describe their favourite meals in several connected sentences. The teacher should review all generated materials for accuracy, clarity, difficulty, and cultural appropriateness.

Multimodal and interactive learning

Young learners often benefit from combining words with visual, auditory, and kinaesthetic experiences. Digital presentations, short videos, picture-based quizzes, and interactive games can support the association between word forms and meanings. When teaching weather vocabulary, for instance, pupils can identify images of sunny, rainy, windy, and snowy conditions, listen to the words, repeat their pronunciation, and use them in simple sentences. A digital activity can then be followed by pair work, a song, or a movement game. Such follow-up tasks connect word recognition with productive language use.

Supporting teachers in materials development

AI may reduce some of the preparation involved in developing classroom resources. Teachers can use approved tools to draft picture-description prompts, organise word lists by topic, produce short reading passages, and generate formative assessment questions. A short story about a family visiting a zoo, for example, could include target words such as "lion," "monkey," "elephant," and "giraffe." The teacher can build comprehension questions, picture sequencing, and a speaking task around the story. AI should remain an assistant in materials preparation, not an unquestionable source of educational content.

Challenges and Pedagogical Considerations

First, age appropriateness and data privacy must be prioritised. Young children should not be expected to use public AI chatbots independently without suitable safeguards. Teachers and schools should follow applicable policies, platform age requirements, and institutional guidance. Where direct pupil access is inappropriate, teachers can use approved tools themselves to prepare classroom materials.

Second, the accuracy and reliability of generated content require careful attention. AI tools may produce incorrect definitions, unnatural examples, unsuitable images, or vocabulary that exceeds pupils' proficiency levels. Teacher review is essential before materials are used. Third, unequal access to

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technology may limit participation. Not every school has reliable internet access or sufficient digital devices; printed picture cards, board activities, and oral games should therefore remain available as alternatives.

Fourth, excessive screen-based activity may reduce opportunities for movement, social interaction, and direct communication. Primary English lessons should balance digital and non-digital tasks. Songs, role-play, pair work, storytelling, and physical-response activities remain valuable. Finally, teachers need digital literacy and professional development to formulate useful prompts, evaluate AI-generated content, protect pupils' information, and select tools according to educational objectives. The key question is not whether AI should be used in every lesson, but whether a particular tool offers a clear pedagogical benefit.

A Practical Framework for Classroom Integration

A practical approach to AI-supported vocabulary teaching can follow five stages:

1.Define the learning objective. Select a manageable vocabulary set linked to the curriculum and pupils' existingknowledge.

2.Prepare and review materials. Use an approved AI tool, where appropriate, to draft definitions, contextualised sentences,picture prompts, or quizzes; check all materials before use.

3.Introduce vocabulary meaningfully. Present words through pictures, real objects, gestures, pronunciation models, andfamiliar contexts.

4.Practise through interaction. Combine teacher-led modelling with digital quizzes, matching activities, pair work,storytelling, and speaking games.

5.Assess and reinforce learning. Use oral questions, picture identification, sentence completion, or an exit ticket, andrevisit the words in subsequent lessons.

For example, a lesson on animals may begin with pictures and pronunciation practice. Pupils then complete a teacher-guided digital matching activity, followed by pair work in which they describe an animal using a simple sentence such as "It is big. It has four legs." The lesson concludes with a brief assessment in which pupils identify or describe selected animals without relying on the screen. This sequence places technology within a broader instructional design and helps the teacher check whether pupils can use target vocabulary independently.

Conclusion

Artificial intelligence and digital technologies offer promising opportunities for supporting vocabulary instruction in primary English classrooms. They can assist teachers in differentiating materials, creating multimodal activities, and providing varied opportunities for vocabulary practice. However, these benefits depend on careful pedagogical planning, teacher oversight, age-appropriate implementation, and equitable access.

AI should not replace teachers' professional judgement or the social and communicative dimensions of language learning. Instead, it should serve as a supplementary resource within a balanced approach that combines digital activities with interaction, movement, storytelling, and meaningful communication. Future classroom-based research could examine how AI-supported vocabulary activities influence pupils' vocabulary retention, motivation, and ability to use new words in speaking. The educational value of AI lies not in technological novelty but in its capacity to support purposeful, inclusive, and learner-centred English language teaching.

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