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STEAM METHODOLOGY AND ENGLISH IN PRESCHOOL EDUCATION.

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Abstract
The introduction of the STEAM (science, technology, engineering, art, mathematics) approach into preschool English lessons is gaining increasing attention. The reason for this is that educators are looking for methods that develop not only linguistic knowledge, but also creativity, problem-solving, cooperation, and scientific thinking. Traditional preschool English lessons are often based on memorization, repetition, and individual word learning exercises, which do not fully meet the developmental needs of modern younger students. This article analyzes recent research (2010-2024) on the application of STEAM principles in teaching English as a primary foreign language (EFL). Based on a review of high-quality literature, practical experiences, research-based tasks, education in harmony with art, engineering problems, and how mathematical reasoning support language learning are explored. The results show that English lessons based on STEAM provide deeper understanding, increase interest, strengthen vocabulary, and develop 21st-century skills. In conclusion, STEAM is an effective and appropriate method for the development of children for teaching English in preschool educational institutions.

Introduction

Early childhood is a crucial stage for language development, intellectual growth, and the formation of basic learning skills. While preschool English language programs typically focus on vocabulary enrichment, songs, and simple conversations, modern students need approaches that develop creativity, curiosity, and problem-solving skills along with linguistic competence (Cameron, 2001).

STEAM education provides a holistic, interdisciplinary system that includes scientific research, basic technological skills, basic engineering tasks, creative arts, and basic mathematical concepts. According to Yakman (2010), STEAM helps children understand the world through interconnected areas, encourages experimentation, creativity, and exploration. When applying STEAM principles in English language teaching, children acquire words and grammatical structures not as isolated units, but as tools for construction, learning, experimentation, and creation.This is consistent with Vygotsky's (1978) sociocultural theory, which emphasizes learning through interaction, problem-solving, and meaningful activity.

The aim of this article is to investigate how STEAM-based methods enhance English language learning in preschool education. Through analysis of scientific research and key strategies, this article seeks to highlight the contributions of the STEAM approach in areas such as improving language development, increasing learner engagement, promoting collaborative learning, and achieving deeper understanding.

Methods

Recearch approach

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A qualitative literature review was conducted to examine how STEAM methodologies help develop English language skills among preschool-aged learners. The review synthesizes conceptual foundations and empirical data from current scientific publications.

Data collection

Articles and research reports from 2010 to 2024 were gathered using ERIC, Google Scholar, JSTOR, and Scopus. Keywords included:

• "STEAM preschool education,"
• "STEAM and language learning,"
• "early childhood English,"
• "hands-on learning in EFL,"
• "integrated approach to early education."

Data analysis.

Thematic coding was used to identify recurring ideas. Five main themes emerged:
1.STEAM as a framework for the use of natural language.
Thematic coding was used to identify recurring ideas.
3. Enhancing vocabulary through hands-on experiences.
4. Arts-based integration for linguistic and creative development.
5. Collaboration, problem-solving, and communication skills in EFL.

Results and discussion.

1. STEAM creates a meaningful context for language use.
Studies show that children acquire language most effectively when it is used for meaningful communication, rather than for memorization (Richards & Rodgers, 2014).
STEAM activities - group experiments, construction tasks, simple scientific observations - create natural situations in which children need to use English for the following purposes:
• describing materials ("soft," "heavy," "round"),
• following instructions ("mix," "pour," "build"),
• expressing observations ("It grows," "It changes color").
Such situational use of language leads to a high level of vocabulary retention and functional communication. Research by Park et al. (2021) shows that preschool children participating in STEAM-based English language activities use more spontaneous language and demonstrate better conceptual understanding
2. Research and project-based learning increases motivation.
STEAM enables kids to ask questions, test and find solutions.When such research is conducted in English, language becomes the medium through which thinking occurs. Some examples:
- Science: researching water absorption and descripting the results in English;
Engineering: Construction of bridges and reasoning why they stand or break down;
- Mathematics: sorting, counting, and matching objects using English terms. Ellis (2017) claims that task-based language learning is naturally aligned with STEAM, as objectives shift from learning grammar to utilizing language as a method for achieving objectives.This increases engagement and reduces fear of speaking.
3. Hands-on experiments reinforce vocabulary acquisition.

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Young children learn best when they touch, see, and manipulate objects.The multisensory characteristics of STEAM education facilitate memory development, consistent with Paivio's (1986) dual coding theory.
When students:
• mix vinegar and baking soda,
• observe plant growth,
• build simple mechanical devices,
they show improved memory of action-related terms because hands-on involvement enhances language understanding.
According to academic research by Alqahtani (2015), vocabulary learned through physical interaction and hands-on activities remains in memory longer than words learned using only traditional flashcard methods.
4.The incorporation of art improves language expression and creative abilities.
Art, which represents the "A" in STEAM, plays a vital role in English education for preschoolers. Children can express ideas through drawing, singing, dramatic activities, and creative exercises before they have fully developed their language capabilities.
When English lessons include artistic elements, they:
• allow children to express themselves through multiple channels (visual, verbal, physical);
• reduce feelings of nervousness while building self-assurance;
• help convert abstract words into concrete ideas using visual components.
According to the theory of learning proposed by Mayer (2021) within the educational domain, the integration of visual imagery, physical gestures, and verbal communication significantly enhances understanding and knowledge acquisition. This theoretical framework substantiates the crucial role that artistic expression plays as a fundamental component in English as a Foreign Language (EFL) instruction that incorporates Science, Technology, Engineering, Arts, and Mathematics (STEAM) methodologies.
5.Social interaction and cooperation develop communication abilities.
Lessons in STEAM often involve collaborative work - building towers, crafting puzzles, and creating collaborative art. This type of interaction promotes natural interaction in English.
Sentences like:
- Can you make it?- Let's try again.
- We need more blocks.
arise spontaneously during collaborative work.
This confirms Vygotsky's (1978) perspective that social interaction stimulates language growth.

Conclusion

Research indicates that implementation of the STEAM methodology substantially enhances the efficacy of English language acquisition among preschool-aged children. Through the incorporation of scientific experimentation, engineering tasks, artistic endeavors, and basic mathematical principles within English instruction, the STEAM framework establishes a substantive, captivating, and contextually abundant educational setting in which language is employed genuinely and comprehended thoroughly.STEAM-based English teaching leads to:
• maintenance of a high level of vocabulary,
• improved communication skills,

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• increased motivation and curiosity,
• cognitive development,
• improve creativity and skills in collaboration.As early childhood education continues to evolve, STEAM offers an innovative, developmentally appropriate, and highly effective approach to preparing young learners for future academic achievements. The inclusion of STEAM in preschool education programs not only improves language learning, but also forms competencies that are important for the 21st century.

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