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Integrating Generative Ai and Sustainability in English Language Teaching

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Abstract

This paper explores the integration of sustainability themes into English curriculum in higher education through the innovative use of generative artificial intelligence (AI) technologies. It reviews relevant literature, identifies research gaps by examining the background, relevance, and significance of this approach, and outlines a methodology for successfully implementing generative AI-powered sustainability integration. It explores the potential of leveraging generative AI technologies to integrate sustainability themes into the English curriculum at the higher education level. It presents relevant theories and frameworks, along with the advantages and limitations of this innovative approach. The goal is to provide a framework for understanding of how this emerging technology can be utilized to enhance students' engagement with sustainability concepts within the context of English language teaching.

Keywords: SDG, English, AI, Curriculum, Education

INTRODUCTION

In recent years, there has been a growing recognition of the urgent need to address sustainability challenges within higher education. As institutions of learning and research, universities play a pivotal role in shaping the knowledge, attitudes and actions of future leaders and decision-makers. Integrating sustainability themes into academic curricula, particularly in disciplines such as English, can foster a deeper understanding of the complex interplay between human activities, the environment and social justice. The significance of this approach lies in its potential to empower students to become agents of change, equipped with the critical thinking skills and interdisciplinary knowledge necessary to tackle pressing global issues. Students can develop a more holistic understanding of the ways in which language, literature and communication can be leveraged to drive positive environmental and social transformation by incorporating sustainability perspectives into English coursework.

LITERATURE REVIEW

A range of studies have explored the potential of generative AI in higher education, particularly in the English curriculum. Zhou (2024) and Wu (2023) both highlight the potential of generative AI in enhancing the learning experience and fostering critical thinking skills. However, Bannister (2023) notes a lack of research in this area, suggesting a need for further exploration. Yeralan (2023) raises concerns about the potential disruptive nature of generative AI in education, emphasizing the need for careful consideration of its implications. Wu (2023) proposes a framework for incorporating GenAI into project-based learning, focusing on algorithmic understanding, bias identification and problem-solving. Bannister (2023) highlights the need for further research on the implications of GenAI in English Medium Instruction (EMI) Higher Education, while López (2023) discusses its potential in information technologies, business and mathematics disciplines. Walczak (2023) raises concerns about the impact of GenAI on traditional teaching approaches and the need for digital literacy and ethical use. Kumar (2024) and Morales-Chan (2024) both highlight the potential of generative AI, particularly Open AI's ChatGPT, in transforming higher education. They

emphasize its role in enhancing pedagogical innovation, academic integrity and experiential engagements in the teaching-learning-assessment process. However, they also acknowledge potential obstacles such as plagiarism and diminished development of interpersonal skills.

The intersection of transformative learning theory, experiential learning theory, and the integrative learning framework with the English curriculum and AI has significant implications for achieving Sustainable Development Goal 4 (Gladstone, 2018; 2020 ,السيد; Khalil, 2023; Ulfa, 2023). These theories and frameworks can be leveraged to create a curriculum that integrates sustainable development concepts and 21st-century skills, aligning with SDG 4 (Gladstone, 2018; 2020 ,السيد; Khalil, 2023). The transformative power of AI in English language learning, as discussed by Ulfa (2023), further supports the achievement of SDG 4 by enhancing students' proficiency in the language. However, there is a need for further research and practical application to fully realize the potential of these theories, frameworks, and AI in the English curriculum and SDG 4.

Recent research has highlighted the potential of transformative learning in higher education, particularly in the context of sustainable development and responsible citizenship (Yeung, 2023; Alam, 2022). This approach emphasizes the need for real-time assignments, new ways to sustain, and disruptive learning, and suggests integrating Web 3.0 technology and Sustainable Development Goals (SDGs) into curriculum design. The synergy between the United Nations' SDG 4 and transformative learning has also been explored, with a focus on inclusive and equitable quality education (Gladstone, 2018). The focus is on active learning strategy, the necessary tasks and course objectives on the premise of what do the teachers want their students to know, to do and feel (Ray & Pani, 2021).

These studies collectively underscore the importance of transformative learning in promoting sustainable development and responsible citizenship in higher education. A review of existing literature reveals a growing body of research exploring the integration of sustainability themes into various academic disciplines, including English. Studies have highlighted the value of incorporating environmental, social and economic sustainability topics into course content, as well as the use of innovative pedagogical approaches, such as project-based learning and interdisciplinary collaborations.

A significant gap in the literature exists regarding the specific application of generative AI technologies to enhance the integration of sustainability themes within English curriculum. While AI-powered tools have demonstrated immense potential in educational settings, their use in the context of sustainability-focused English instruction remains largely unexplored. This research aims to address this gap by developing a comprehensive framework for the effective deployment of generative AI to support the integration of sustainability themes in higher education English programs.

OBJECTIVES

The primary objectives of this research are to:

1. Explore generative AI technologies to facilitate the integration of sustainability themes into English curriculum in higher education
2. Develop an integrated framework of generative AI-and English curriculum

METHODOLOGY

The study employs the exploratory method to achieve its objectives and conduct qualitative analysis.

THEORETICAL FRAMEWORK FOR SUSTAINABILITY

INTEGRATION

Transformative Learning Theory

Transformative Learning Theory, proposed by Jack Mezirow, emphasizes the importance of critical reflection and perspective transformation in the learning process. This framework aligns well with the integration of sustainability themes, as it encourages students to challenge their existing assumptions, engage in critical analysis, and adopt new ways of thinking about environmental and social issues. Generative AI can facilitate this transformative learning experience by

providing personalized prompts and feedback, enabling students to delve deeper into complex sustainability-related topics and develop a more nuanced understanding.

Experiential Learning Theory

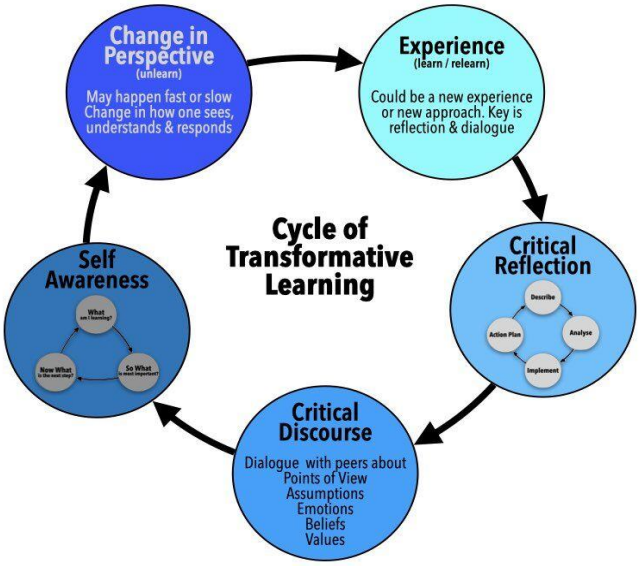

Fig.1.Transformative Learning (Aubrey & Riley, 2022)

Kolb's Experiential Learning Theory highlights the value of hands-on, immersive learning experiences. Students can engage in real-world applications and experiments by incorporating sustainability themes into the English curriculum, such as analyzing sustainability-focused literature or creating digital content using generative AI tools. This approach fosters a deeper understanding of sustainability concepts and their interconnectedness with language, communication and cultural narratives.

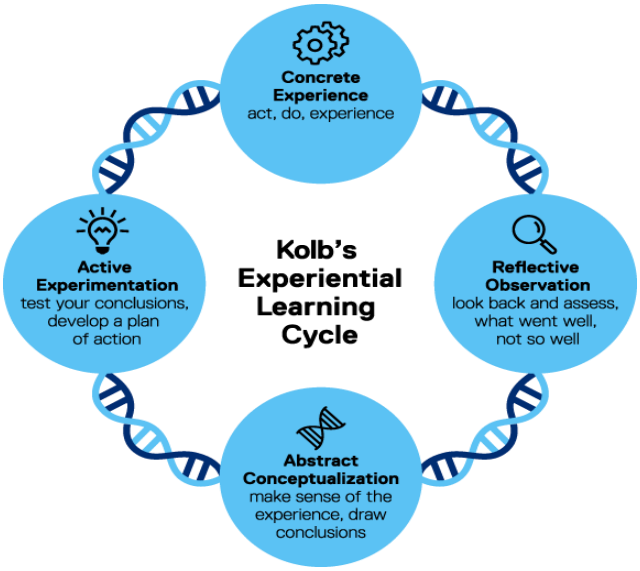

Fig.2 Experiential Learning Cycle (Kolb, 1984)

Integrative Learning Framework

The Integrative Learning Framework, developed by the Association of American Colleges and Universities, emphasizes the importance of connecting different disciplines and domains of knowledge. Integrating sustainability themes into the

English curriculum aligns with this framework, as it encourages students to make interdisciplinary connections between environmental, social and literary studies. Generative AI can support this integration by enabling students to create cross-disciplinary projects, such as sustainability-focused poetry or interactive narratives.

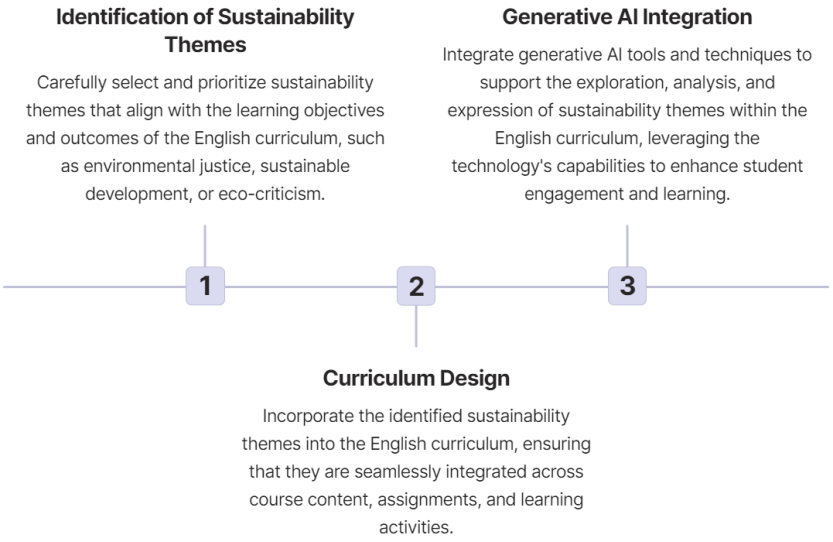

Fig.3. Integrative Theoretical Framework

GENERATIVE AI FOR SUSTAINABILITY INTEGRATION

Generative AI is used for sustainability integration. The table presents:

Tool Name with Link	English & Communication Topics	Multidisciplinary (SDG4)	Integration Strategies/Pedagogies
ChatGPT	Creative Writing, Essay Structuring, Language Learning	Promotes quality education by enhancing learning experiences	Interactive assignments, personalized feedback, AI-generated prompts
AI Illustrations	Visual Storytelling, Digital Literacy, Multimedia Presentations	Fosters interdisciplinary skills by combining art and Communication	Visual aids for storytelling, integration with digital tools, collaborative projects
Generative AI for Curriculum Analysis	Curriculum Development, Emerging Topics Identification	Aligns educational content with sustainability goals and emerging trends	Analyzing and updating curricula, identifying interdisciplinary learning opportunities, continuous curriculum improvement
Ethical AI Tools	Critical Thinking, Ethical Decision-Making, Reflective Writing	Supports sustainable development by promoting ethical AI usage	Four-step integration: preparation, application, critical thinking, reflection

Responsible AI	Professional Communication, Technical Writing, Societal Impact Discussions	Contributes to responsible consumption and production (SDG12)	Teaching responsible AI usage, discussing AI's societal impacts, integrating AI with communication studies

Tools and Applications

The research will explore the use of various generative AI tools, such as large language models and text generation algorithms, to create customized learning materials, prompts and exercises that seamlessly integrate sustainability themes into English curriculum. These AI-powered resources will be designed to enhance student engagement, critical thinking and problem-solving skills.

Sustainability Themes

The English curriculum is designed to address key sustainability themes, such as climate change, environmental justice, social equity, and sustainable development, as outlined in the United Nations Sustainable Development Goals (SDGs). These themes are woven into the course content, assignments and discussions to foster critical thinking and interdisciplinary learning.

Curriculum Integration

The integration of sustainability themes into the English curriculum is achieved through various methods, including the development of sustainability-focused reading lists, the incorporation of sustainability-related writing prompts, and the creation of multimedia projects that explore the intersection of language, literature and sustainability.

Advantages of Generative AI for Sustainability Integration

Generative AI can create customized learning materials, such as sustainability-themed essays, poems, or short stories, tailored to individual student needs and interests. Integrating generative AI tools can enable students to engage with sustainability themes through various modes, such as creative writing, digital storytelling and multimodal compositions. Generative AI can facilitate collaborative learning, where students can co-create sustainability-focused projects and engage in peer-to-peer feedback and knowledge sharing.

LIMITATIONS AND CONSIDERATIONS

Implementing generative AI in the classroom may require significant technological infrastructure and faculty training, which can pose challenges for some educational institutions. The use of generative AI raises ethical considerations, such as issues of authorship, plagiarism and the potential for biased or inaccurate content generation, which must be carefully addressed. Integrating generative AI into the English curriculum may require rethinking traditional teaching and assessment methods, which can be time-consuming and require significant faculty development efforts.

CONCLUSION

This research paper has outlined a comprehensive approach to integrating sustainability themes into English curriculum in higher education through the innovative use of generative AI technologies. The proposed framework aims to enhance student engagement, critical thinking, and environmental and social consciousness by leveraging the power of AI-driven learning resources. The research findings presented in this paper demonstrate the immense potential of this approach to drive positive change and contribute to the broader goals of sustainability in higher education. Integrating sustainability themes into the English curriculum through the use of generative AI presents a promising opportunity to enhance student learning and engagement. This innovative approach can foster critical reflection, interdisciplinary connections and a deeper understanding of the interconnectedness between environmental, social and literary studies by drawing on established educational frameworks, such as Transformative Learning Theory and Experiential Learning Theory. While there are technological, ethical and pedagogical considerations to address, the potential benefits of this integration,

including personalized content generation, multimodal engagement and enhanced collaboration, make it a compelling direction for innovation in higher education.

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