

Chapter 5

Advancing Transnational Education by Integrating Artificial Intelligence Technology and Backward Design Principles in Technical English Curriculum

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ABSTRACT

The Technical English curriculum is constantly underrepresented in English for Specific Purposes (ESP) programs (Hyland, 2006). This study investigates using artificial intelligence (AI) technology to develop a backward design curriculum for Technical English in preparatory year programs, targeting the CEFR A2-B1 level. The study employed a mixed-methods approach, using 58 students and seven teachers as participants at a local university. The findings demonstrated a notable enhancement in student learning outcomes through implementing an AI-enhanced curriculum, as seen by considerably higher engagement scores in the experimental group. The thematic analysis revealed themes related to enhanced educational effectiveness, individualized learning, and the difficulties encountered during implementation. The research suggests that instructors should undergo professional development, investment in digital infrastructure, and collaborative curriculum planning should be implemented. The study was done in Saudi Arabia, but its findings may be used in transnational and cross-border contexts.

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INTRODUCTION

The Technical and Industrial English curriculum is conspicuously underrepresented in English for Specific Purposes (ESP) programs. For instance, (Hyland, 2006) observes that EAP's development and leading position in ESP have shown remarkable growth with significant contributions to teaching English. Besides, the unique needs of technical and industrial learners complicate the development of relevant and workable curricula in the literature. Testimony to this inadequacy lies in the demand for highly specialized material and qualified teachers in technical English. Literature cannot be generalized and has to cater to the specific needs of technical and industrial students, further making developing relevant and practical courses more complex. More broadly, A fairer curriculum development system is needed for the specialized fields.

The development of technology has significantly changed the educational fields with much more impact on technical fields where English is a critical language. Technical English competence in technical education is a requirement for understanding specialty information, collaboration at an international level, and keeping abreast of the latest developments. For instance, a study (Jamalova, 2024) has demonstrated that ways of teaching Technical English traditionally based on fixed materials and basal teaching procedures are being investigated to respond to the demand for more interactive, customized, and contextually appropriate learning experiences. This change is based on the findings of the recent report (Johnson & Brown, 2022), which underscore adaptive and practical approaches in teaching technical English to the changing demands of globalized technical education landscapes.

The backward design is a purposeful and deliberately planned approach to curriculum development. It starts with clearly understanding the desired learning results and designing instruction and assessment activities that align with those outcomes. The (Wiggins & McTighe, 2005) model emphasizes being clear on learning goals, ensuring that assessment matches these goals, and designing activities that likely lead students to the targeted results. Implementing backward design within the context of Technical English education aims to ensure that the emphasis in the curriculum is placed on providing the learners with specific linguistic abilities required in the technical domains. AI technologies are becoming relatively robust and powerful not only in many areas of human life but also in the sphere of education. Creative technologies and platforms could support personalized learning, simplify administrative chores, and give immediate feedback. Modern ways of language education may assess student performance, pinpoint areas for improvement, and adapt teaching materials to specific learner requirements. This will be a handy feature in the more technical-oriented English classes because technical language is very complex and detailed, hence the need for a more personalized approach. There are specific significant challenges this incorporation of AI technology into a backward design-based A2 curriculum for Technical English seeks to address:

- **Customization:** Traditional methods that cater to all students could be more effective. Adaptive technologies can provide personalization in learning based on an individual's strengths and weaknesses, which boosts a student's performance and engagement level.
- **Engagement:** Curricula using interactive and adaptive technologies make the whole process so much more enjoyable for the students and ensure active participation and interest on their part.
- **Efficiency:** Technology makes the assessment process efficient and gives feedback on time. The teacher can spend more time helping the learning process than doing paperwork. Alignment with Industry Needs: As the technical workforce's dependence on specific English language skills in-

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