ADAPTIVE DIGITAL LEARNING TECHNOLOGIES IN ENGLISH FOR SPECIFIC PURPOSES

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Annotation. This thesis explores the role of adaptive digital learning technologies in teaching English for Specific Purposes (ESP). It examines how digital platforms, artificial intelligence, learning analytics, and personalized learning systems can address students’ individual needs, language proficiency levels, and professional goals. Particular attention is given to the development of specialized vocabulary, professional communication skills, and learner autonomy. The thesis also discusses the benefits and challenges of implementing adaptive technologies in higher education. It argues that the effective integration of adaptive digital tools into ESP instruction can improve learning flexibility, engagement, and the relevance of language education to students’ future professional activities.

Keywords: adaptive learning, digital technologies, English for Specific Purposes, personalized learning, artificial intelligence, learning analytics, learner autonomy, higher education.

The rapid development of digital technologies has significantly influenced contemporary approaches to foreign language education. In higher education, students are expected to acquire English language skills that correspond to the requirements of their academic disciplines and future professions. This demand has increased the importance of English for Specific Purposes (ESP), which focuses on developing language competence in specialized professional and academic contexts. However, ESP learners often differ in their language proficiency, learning pace, professional interests, and educational needs. A single teaching approach may not adequately address these differences. Consequently, adaptive digital learning technologies have become increasingly important because they can adjust learning

materials, activities, and feedback according to individual learner characteristics and performance.

The aim of this thesis is to examine the potential of adaptive digital learning technologies in ESP instruction and identify their contribution to personalized learning, professional language development, and learner autonomy.

English for Specific Purposes is designed to help learners use English effectively in particular academic, professional, and occupational situations. According to Hutchinson and Waters (1987), ESP is a learning-centred approach that considers learners’ specific purposes and needs. Therefore, successful ESP instruction requires the selection of relevant vocabulary, authentic materials, and communicative activities related to learners’ future professional responsibilities. Adaptive digital learning technologies are educational tools and systems that modify learning content, task difficulty, learning pathways, or feedback in response to information about learners’ progress and needs. These technologies may include adaptive learning platforms, intelligent tutoring systems, AI-supported applications, digital assessment tools, and learning analytics systems. Unlike traditional digital materials that provide the same content to every learner, adaptive systems aim to offer more individualized learning experiences.

One of the main advantages of adaptive technologies in ESP is personalized instruction. For example, students with limited English proficiency may receive additional grammar exercises, vocabulary explanations, and guided reading activities. More advanced learners may work with authentic professional texts, complex case studies, and specialized communication tasks. By adjusting the difficulty and sequence of activities, adaptive learning can help learners progress at an appropriate pace.

Another important application is the development of professional vocabulary. ESP students need to understand and use terminology related to their chosen fields. Medical students, for instance, require knowledge of medical terminology, while engineering students need vocabulary connected with technical processes and

equipment. Adaptive platforms can identify frequently occurring errors and provide additional practice in areas where learners experience difficulties. Spaced repetition and personalized vocabulary exercises can also support the retention and practical use of specialized terms. Adaptive digital technologies can further enhance professional communication skills. Online simulations, interactive dialogues, and AI-supported conversation tools allow students to practise job interviews, presentations, workplace discussions, and professional negotiations. The complexity of these activities can be adjusted according to learners’ performance. For example, students who struggle to formulate professional responses may receive sentence prompts and vocabulary support, whereas more proficient learners may complete the same task with fewer instructions.

Learning analytics represents another significant aspect of adaptive ESP instruction. Learning analytics involves collecting and interpreting information about students’ learning activities and performance. Teachers can use assessment results, completion rates, and error patterns to identify learning difficulties and make informed instructional decisions. If students repeatedly make mistakes when writing formal emails, teachers can provide targeted exercises on professional register, organization, and appropriate expressions. In this way, digital information can support more effective teaching and timely intervention. Adaptive technologies may also increase learner autonomy and motivation. Students can practise independently, monitor their progress, and receive immediate feedback. This flexibility is particularly valuable in higher education, where learners may have different schedules and professional objectives. Furthermore, personalized tasks can make learning more relevant by connecting language activities with students’ future careers.

Nevertheless, the implementation of adaptive technologies presents several challenges. Access to reliable internet connections, suitable devices, and effective digital platforms may differ among institutions and learners. In addition, adaptive systems do not always interpret learner performance accurately, and automatically

generated content may contain linguistic or factual errors. Data privacy, accessibility, and the responsible use of artificial intelligence must also be considered. Another limitation is that adaptive technology cannot independently replace the pedagogical expertise of an ESP teacher. Professional communication requires critical thinking, cultural awareness, collaboration, and the ability to respond appropriately to unpredictable situations. These skills need authentic interaction, discussion, and teacher guidance in addition to digital practice. For these reasons, adaptive technologies should be integrated into ESP courses through a balanced pedagogical approach. Teachers should first identify learners’ needs and professional objectives, then select appropriate digital tools and establish clear learning outcomes. Students can complete adaptive online activities before applying their knowledge in classroom discussions, role-plays, presentations, and collaborative projects. Regular teacher assessment is essential to ensure that digital recommendations support genuine language development.

Adaptive digital learning technologies offer promising opportunities for improving English for Specific Purposes instruction. By adjusting learning activities to individual needs, these technologies can support specialized vocabulary acquisition, professional communication, independent learning, and continuous progress monitoring. Learning analytics and personalized feedback can also help teachers identify students’ difficulties and organize more targeted instruction. However, the effectiveness of adaptive learning depends on the quality of digital resources, access to technology, data protection, and appropriate pedagogical guidance. Technology should complement rather than replace the ESP teacher and authentic communication activities. When implemented systematically, adaptive digital learning technologies can make ESP education more flexible, individualized, and relevant to the professional needs of university students.

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