



What Does Digitalization Offer to English for Specific Purposes Learning? : A Systematic Literature Review

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Abstract: This study aims to discover what digitalization offers to promote students' learning in ESP classrooms and the contributions of lecturer digital competency to student learning. This study employed a systematic literature review with SALSA (Search, Appraisal, Synthesis, and Analysis) procedure and analyzed 15 article journals from Sinta and Scopus indexed journals to ensure credibility. The data were analyzed using thematic analysis to identify patterns and categories related to digitalization in ESP learning. The findings suggest that digitalization in ESP classes offers several benefits for student learning including learning content accessibility, assignment efficiency, flexibility, engagement, interaction, motivation, academic skills, and performance improvement, and promoting some of the 21st-century skills. Lecturers' digital competence is also trusted to contribute to students' learning, covering instructional effectiveness, engagement, interaction, assessment, and motivation. To summarize this study, developing a supporting digital environment for higher education learning is strongly recommended by selecting appropriate digital tools, properly infusing the tools into the curriculum and learning with the caveat that all parties involved be adequately trained, and considering students' long-term engagement in the digital environment. Technology-related issues, such as bandwidth and student technological fatigue, deserve to be addressed.

Article History

Received: 31-10-2024

Revised: 29-11-2024

Accepted: 10-12-2024

Published: 21-01-2025

Key Words:

Digitalization;
English for Specific
Purposes; Educational
Technology;
Teacher Competence;
Higher Education
Learning.

How to Cite: Yunita, S., Susilawati, S., Darwis, R., & Ramadhan, A. (2025). What Does Digitalization Offer to English for Specific Purposes Learning? : A Systematic Literature Review. *Jurnal Paedagogy*, 12(1), 172-184. doi:<https://doi.org/10.33394/jp.v12i1.13363>



<https://doi.org/10.33394/jp.v12i1.13363>

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Introduction

As the world becomes more digital, it is currently important to integrate digital tools into English for Specific Purposes (ESP) learning. It is necessary to have language skills that are specific to students' professional fields. Digital tools not only enhance access to information but also contribute to the creation of an interactive, personalized learning environment. Constantinou and Papadima-Sophocleous (2020) emphasized that digital skills are necessary for today's jobs, while Thornhill-Miller et al. (2023) stated the importance of helping students learn to handle complex digital settings. This research will examine how digitalization supports ESP learning and how teachers' digital skills impact student success.

However, there are still several issues to do with current approaches of digitalization that inhibit the advancement of ESP teaching and learning. Even for those with modern gadgets, this can be very serious in particular areas as access to technology is limited because of poor internet connectivity. This contributes to a disparity in learning opportunities (Andriani, 2023). Furthermore, most teachers are not sufficiently skilled in the use of digital



equipment, and as such many teaching possibilities are lost (Isnaniah & Ningsih, 2023). All these raise the serious need to explore precisely how digital tools can actually help ESP.

These issues have prompted different solutions to be proposed. Initially, encouraging the creation of basic structural technologies will help in ensuring all learners get easy access to learning materials. This can be done through partnership as well as support from the government, school institutions, and the private sector (Dewi et al., 2024). Moreover, it is advocated that teacher training, regarding the use of gadgets among teachers, should focus on their successful integration into real-life (Farahsani & Harmanto, 2022). Such initiatives would not only benefit the teachers but the ESP students as well in their learning processes. There have been studies on educational digitalization, however, as for the employment of such techniques within ESP concerns, there is still a big void. Certain researchers successfully analyzed digital literacy abroad but very few devote themselves to the contributions of such knowledge in specific fields (Huang, 2024). This issue needs to be addressed to formulate the most effective ways of teaching that will be appropriate for the specific group of ESP learners.

In recent years, many researchers have analyzed the impact of digitalization on the teaching of ESP from various angles. For example, Asmali (2018) and Akbar and Noviani (2019) focused on Learning Management Systems, and adaptive technologies in ESP teaching. Many studies such as those carried out by Dewi et al. (2024) also examined the use of digital tools to enhance cooperative learning among students as well as their motivation to learn. Together, all these studies highlight the growing significance of teaching digital literacy as part of teaching ESP.

To determine this, the research aims to answer two basic questions — (i) What does digitalization offer to ESP learning? (ii) How does ESP lecturers' digital competence support student learning? This research attempts to answer these questions by providing suggestions for actions to assist ESP educators in enhancing digital literacy and thus creating a more effective, digitally-optimized learning environment (Constantinou & Papadima-Sophocleous, 2020). The discussed work highlights the growing need for digitalization in education, particularly in ESP learning contexts where the need for specialized language skills coincides with technological advancements. The originality of the present research is based on its comprehensive investigation into the potential of digitalization in overcoming instructional and engagement problems within ESP classrooms, a domain that has continued to be inadequately explored despite its growing significance.

Research Method

This research used a qualitative approach, with a systematic literature review method. This SLR is applied to identify relevant research for evaluation to answer the research questions. The SLR procedures were adapted from Mengist et al. (2020), precisely using the SALSAs (Search, Appraisal, Synthesis, and Analysis) procedure. Following the research questions formulation, in the stage of searching, the researchers applied inclusion and exclusion criteria, and the quality of the articles. The databases used to search for the articles are Sinta, the Indonesian Science and Technology Index, and Scopus, the index of international reputable journals. Concerning the search terms, the researchers initially looked for the terms “impact”, “influence”, “effect”, “digitalization”, “ESP”, “English for Specific Purposes”, “higher education”, “university”, and “learning”. However, since the results were somewhat out of the expectations, the researchers refined the keywords pertinent to those



listed words. The inclusion-exclusion criteria applied to the relevant articles are presented in Table 1.

Table 1. The inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Articles published in the Sinta (ranked 2, 3, and 4) and Scopus database	Research papers (theses or dissertations)
Articles published in 2020-2024	Conference papers
Articles are open-accessed	ESP learning in high schools
Articles written in English	

From applying the inclusion and exclusion listed in Table 1, the researchers decided to include the following articles as the subjects of the present study. Fifteen articles were chosen, listed in Table 2.

Table 2. The reviewed articles

No	Author	Title
1	Al-Baekani et al. (2023)	Engaging students in a flipped classroom instruction: Teaching English for specific purpose (Esp) in higher education
2	Alshaye et al. (2024)	Learning English for specific purposes (ESPs) through social media platforms (SMPs): A systematic review
3	Beltrán-Palanques (2024)	Assessing video game narratives: Implications for the assessment of multimodal literacy in ESP
4	Etfita et al. (2023)	Gamification on Netboard: The students' perceptions of its practice in ESP classroom
5	Fauzi et al. (2023)	Utilizing digital learning resources in English-specific purposes learning classroom: Esp teachers' perspectives
6	Girón-García and Fortanet-Gómez (2023)	Science dissemination videos as multimodal supporting resources for ESP teaching in higher education
7	Nugroho et al. (2022)	Digital teaching awareness and practice: Narratives from Indonesian Esp teachers
8	Pudyastuti et al. (2023)	Using Telegram application to promote student engagement in ESP classroom
9	Qasem et al. (2023)	Dialog chatbot as an interactive online tool in enhancing ESP vocabulary learning
10	Ramadhani et al. (2022)	University students' perspectives on lecturer's digital class organization in teaching ESP amid Covid-19 pandemic
11	Sa'diyah (2022)	Embracing technology in Esp classes: Is it a learning tool or just cool tool?
12	Sholikhi (2020)	Edmodo use in ESP writing: The perceptions and barriers of Sociology students
13	Surani et al. (2023)	Integrating digital literacy in English for Specific Purposes (ESP) instruction via English for law e-module.
14	Sukmawati et al. (2023)	Implementation of technology on English for Specific Purposes (ESP) students in communicative language teaching approach.
15	Syakur et al. (2022)	The development of an "Abyak" application for ESP learning: Insights from Indonesia

Once the steps of search and appraisal were finalized, the researchers started the synthesis step by extracting and categorizing the articles included. They were divided into two based on their expected relevance to answering the research questions. The segmented articles are presented in Table 3.

Table 3. Articles segmentation based on the research questions

Articles	Research Questions
Al-Baekani et al. (2023) Alshaye et al. (2024) Beltrán-Palanques (2024)	What does digitalization offer to ESP learning?



Etfita et al. (2023)
 Girón-García and Fortanet-Gómez (2023)
 Pudyastuti et al. (2023)
 Qasem et al. (2023)
 Sa'diyah (2022)
 Sholikhi (2020)
 Sukmawati et al. (2023)
 Surani et al. (2023)
 Syakur et al. (2022)
 Fauzi et al. (2023) How does ESP lecturers' digital competence support student learning?
 Nugroho et al. (2022)
 Ramadhani et al. (2022)

The data obtained were analyzed using a thematic analysis derived from Naeem et al. (2023). The researchers began with data familiarization after segmenting the data based on the research questions. Similar and relevant statements were then categorized across all articles using numerous associated codes. The researchers coded brief phrases using inductive coding. In the following step, developing the theme, the researchers attempted an inductive method, taking analytical judgment from the codes and transforming them into a more abstract theme. They proceeded with data conceptualization by developing interpretations based on the established themes. In the final step, which Naeem et al. (2023) refer to as "developing a conceptual model," the researchers attempted to theorize the findings by comparing what they discovered about the promises of digital technology in ESP classes and the importance of educators' digital competence in promoting learning to the pertinent theories and previous research; to simply put, justification was made in this phase.

Results and Discussion

Digitalization offers to ESP learning

The first research question was addressed by examining eight publications. Table 4 displays the findings.

Table 4. Digitalization's offers to ESP learning

Studies	Aspect offered by digitalization in ESP classes	Categorization
Al-Baekani et.al. (2023); Sholikhi (2020); Surani et.al (2023);	Access to learning materials	Learning resources accessibility
Al-Baekani et.al. (2023)	Access to authentic materials	
Surani et.al (2023)	Finalization of lecturer's assignments	Assignment efficiency
Al-Baekani et.al. (2023)	Learning anytime and anywhere	Learning flexibility
Al-Baekani et.al. (2023); Etfita et.al. (2023); Pudyastuti et.al. (2023); Sholikhi (2020)	Students' engagement	Engagement
Etfita et.al. (2023)	Technology engagement	
Pudyastuti et.al. (2023); Qasem et al. (2023); Sa'diyah (2022); Sholikhi (2020); Sukmawati et.al. (2023)	Interaction	Interaction
Pudyastuti et.al. (2023)	Indirect communication which is more comfortable for some students	
Al-Baekani et.al. (2023); Alshaye et al. (2024); Pudyastuti et.al. (2023); Sa'diyah (2022); Sukmawati et.al. (2023)	Motivation	Motivation



Sholikhi (2020)	Confidence	
Pudyastuti et.al. (2023)	Immediate feedback for assignment	Digital assessment
Beltrán-Palanques (2024)	Multimodal text assessment	
Etfita et.al. (2023)	Learning performance	Academic skills and
Girón-García and Fortanet-Gómez (2023)	Listening comprehension, content, and language	performance
Sa'diyah (2022)	Vocabulary enrichment	
Syakur et al. (2022)	Speaking skills	
Sa'diyah (2022); Solikhi (2020)	Students' creativity	21st century skills
Pudyastuti et.al. (2023); Sholikhi (2020); Sukmawati et.al. (2023)	Collaboration	
Solikhi (2020)	Problem-solving skills	

From the data listed in Table 4, 10 categorizations could be drawn: learning resources accessibility, assignment completion, learning flexibility, engagement, interaction, motivation, digital assessment, academic performance, and outcomes, supporting learning environment, and 21st-century skills. The discussion of each point is elaborated as follows.

1) Learning materials/resources accessibility

The findings reported by Surani et.al (2023), Al-Baekani et.al. (2023), Solikhi (2020), and Al-Baekani et.al. (2023) highlight that technology used in ESP classrooms has enabled students to access learning materials or resources. This suggests that technology has provided each student with easy accommodation to finds materials and resources they need for their learning. When students have vast access to learning materials, the circumstance to enrich their knowledge and skills are widely opened. First, they might have access to review the materials being learned. In this case, it is evident that technology will facilitate students with the stage of reviewing or recalling the materials being learned. Second, they access materials for much vaster and more relevant materials. In the context of ESP learning where content and language should be balanced, access to content cannot be disregarded. Accessing learning materials will unveil chances for students to intensify their knowledge. A study conducted by Rizk and Hillier (2022) confirmed that technology allows wider greater access to instructional content serving a momentous function to promote learning. Besides, accessibility to learning resources is proven to influence learning style and adaptability toward course-infusing digital platforms (Razali et al., 2022). Although accessibility sometimes becomes a technical issue (Botelho, 2021), with the rapid development of the current technology, these issues might be minimized by choosing many appropriate platforms.

2) Assignment efficiency

The study of Surani et.al (2023) reported that the use of technology enables students to complete assignments given by their lecturers. The finding could imply that students are helped in completing their lecturers' assignments on a specific platform, or that they can use technology to assist them in discovering necessary materials to accomplish non-based digital assignments. What Surani et.al reported either corresponds to the fact that most educators utilize technology to support instructions such as materials delivery (Abedi, 2023), and assignments as well. The study of Malakar and Begum (2024) further indicated that the usage of technology in school has increased on multiple occasions, notably in completing assignments.



3) Learning flexibility

Al-Baekani et al. (2023) reported that using technology in ESP classes has guided learning to be flexible. This accommodation has enabled students to learn without regard to time or location. This flexibility may result in greater freedom to study. Students will have ways of determining when and when they can conduct learning-related explorations. As a result, behavioral engagement will grow. This has been proven by a study that technology promises to extend students' behavioral engagement (Kokoç, 2019).

With the current development in which online classes or even hybrid learning are preferable, flexibility will become the utmost of significance. For higher education institutions (HEIs) attempting to offer more flexible courses (Müller & Mildenerger, 2021), some significant things should be taken into consideration, such as sufficient course structure, stimulating assignments, interactivity, instructor attendance, feedback delivery, and outcomes (Müller et al., 2023).

4) Engagement

The next point offered by digitalization to ESP classes is engagement (Al-Baekani et al., 2023; Etfita et al., 2023; Pudyastuti et al., 2023). Two types of engagement were identified: learning engagement (Al-Baekani et al., 2023; Etfita et al., 2023; Pudyastuti et al., 2023), and technology engagement (Etfita et al., 2023).

The first point, learning engagement, emerged during the use of digital platforms. The students are stimulated to participate actively in learning. This finding agrees with what Rizk and Hillier (2022) found in their study, that greater opportunities offered during classroom sessions, will promote engagement. The second point is generated by their learning engagement. When students feel interested and participate in the classroom, they are likely to have frequent encounters with technology and they do not feel forced to use the platforms. They invest their time using technology, and in the end, they will find value in learning (Maričić & Lavicza, 2024). It is evident here that engagement in learning and using technology influences one another. In short, it is obvious that technology has a strong potential to develop students' learning. Therefore, universities establishing a tactical policy to preserve this potential is highly recommended (Pandita & Kiran, 2023).

5) Interaction

The aspect of interaction offered by technology was identified in the research of Pudyastuti et al. (2023), Qasem et al. (2023), Sholikh (2020), and Sukmawati et al. (2023). Sholikh's study (2020) was concerned with how technology connects lecturers and students, while Pudyastuti et al. (2023) underlined the interaction between students-lecturers and students-to-students. Pudyastuti et al even found out an interesting point is, that shy students would interact with their friends or lecturers using technology. From these findings, an inference could be made, that technology accommodates social aspects of users. A study underlined that an online or hybrid environment could facilitate interaction (Mena-Guacas & Velandia R, 2020), implying that the presence of a digital platform could assist people connect to their surroundings; in this case, the interaction takes place in an academic environment. Connectedness between users both students-lecturers and students-students could help minimize misunderstanding during learning and maximize communication among them. With such an effective pattern, lecturers might bring much lively learning atmosphere.

6) Motivation

Technology infused in the classroom was also reported to allow for motivation to emerge and increase (Al-Baekani et al., 2023; Alshaye et al., 2024; Pudyastuti et al., 2023; Sa'diyah, 2022; Sholikh, 2020; Sukmawati et al., 2023;). As the learning situation was



enjoyable (Al-Baekani et al., 2023), lively (Pudyastuti et al., 2023), interactive (Sa'diyah, 2022; Sholikhi, 2020), and the technology use is interesting (Alshaye et al., 2024), the learning could be triggering students' motivation. Such engaging situations seemingly stimulate students to participate in learning. Student participation plays a crucial role in increasing the learning atmosphere and efficiency when using technology. As reported by Mumba & Sultana-Muchindu (2024), a favorable attitude among students regarding learning with technology matters greatly since it allows for effective instruction.

The aspect of confidence was also facilitated by technology infused into learning. Yahiaoui et al. (2022) included this confidence aspect in motivation and claimed this aspect to be highly affected by technology. Recent research has admitted that technology implementation has significantly improved students' confidence with respect to experiential learning that connects theory to real-world tasks (Best et al., 2024).

7) Digital assessment

In general and wide use, technology infusion into ESP classes, for example, videos, is claimed to provide assessment for multimodal literacy (Beltrán-Palanques, 2024). Specifically, the research of Pudyastuti et.al. (2023) highlighted the facilitation of technology to provide immediate feedback for students' assignments. They demonstrated that the feedback could be conveyed directly and tailored to students' needs. This will help lecturers to effectively and efficiently work on assessing students' tasks. Current research has proven many digital tools can be integrated into classroom learning for efficient learning including feedback delivery, such as using social media (Alshaye et al., 2024). The more efficient platforms offered, the more exposure students might get.

However, some aspects should be taken into account. In addition to choosing proper digital platforms to meet the student's needs, the way feedback is delivered (Nieminen et al., 2023), types and quality of feedback (Dai et al., 2024) should be the top priority for lecturers to consider. By integrating these aspects, learning evaluation is predicted to be effectively reflected and better curriculum planning could be developed.

8) Academic skills and performance

Another element that is facilitated by technology is the increase in academic skills and performance. Girón-García & Fortanet-Gómez (2023) showed evidence that technology such as videos could be used to assist students with listening comprehension, as well as media to access content and language in ESP classrooms. Besides receptive skills, productive skills such as ESP students' speaking skills could be enhanced by the infusion of technology (Syakur et al., 2022). Another element of language skills that could be fostered by technology is vocabulary, as Sa'diyah (2022) proved in her study, that the application used in her classroom assists students in vocabulary enrichment. In general, Etfita et al. (2023) claimed that the platform integrated into their classroom had received good acceptance by the students to improve their performance in ESP classes.

When lecturers try to equip students with particular language skills such as vocabulary, integrating technology for its enrichment is highly advised. Many tools categorized as TELL (Technology Enhance Language Learning) could be alternatively incorporated into ESP classes such as Kahoot (Wang & Tahir, 2020), and Dialogflow (Qasem et al., 2023). More particularly, since ESP students should also be exposed to technical vocabulary, utilizing technology cannot be neglected. Respecting the students' performance, the elevation of learning performance offered by technology is fundamentally dependent on how students use the technology. Guided use provided by lecturers and wise use applied by students shall have an influential impact on students' learning performance. When students



utilize the integrated technology appropriately, what could be impacted will not be solely about performance, but also about rules or policies at schools (Timotheou et al., 2023).

9) The 21st-century skills

Technology integration was regarded as encouraging the learning of 21st century skills and capabilities such as reported in the reviewed articles. Sa'diyah (2022) and Sholikhi (2020) found out that technology used in the classroom could enhance students' creativity. Pudyastuti et.al. (2023) and Sukmawati et.al. (2023) agreed that technology could also accommodate collaboration among students. Sholikhi (2022) also noticed those two aspects and added that technology could also promote the problem-solving skills of students.

The findings conform with current research discoveries. The research of Ramaila and Molwele (2022) discovered that technology integration serves to build the development of skills such as communication, critical thinking, collaboration, problem-solving, and computational thinking. Another research reported by UNESCO demonstrated that technology impacts students' digital literacy (Claro & Castro-Grau, 2023). They contend that strengthening higher-order cognitive skills is necessary for critical and creative thinking in digital environments with high circulation of information and data.

ESP lecturers' digital competence supporting student learning

Three articles were reviewed to address the second research question. The findings are outlined in Table 5.

Table 5. Contributions of ESP lecturers' digital competence on students learning

Studies	Lecturers' digital competence contributions	Categorization
Fauzi et al (2023)	Efficient lesson delivery and enhanced access to learning content	Instructional effectiveness
Nugroho et al (2022)	Improved student engagement and interaction Students' engagement	Engagement and interaction
Ramadhani et al (2022)	Real-time feedback provision and increased student motivation	Feedback and motivation

From the data listed in Table 5, three key categorizations were identified: instructional effectiveness, engagement and interaction, and feedback and motivation. The discussion of each category is elaborated as follows.

1) Instructional effectiveness

In a study focused on behavioral learning, Fauzi et al. (2023) emphasized that the digital competence of teachers enhances both the availability and the dissemination of content. The study stated that teachers who are digitally skilled can enhance learning materials and make them more available for the students, aiding the students in getting extra content and resources and understanding the subject matter in a better way. Such findings were similarly reported by Timotheou et al. (2023), who noted that training on digital platforms improved teacher delivery and enhanced the learning experience for the students.

2) Engagement and interaction

Nugroho et al. (2022) argued that teachers' ability to work with digital devices is a contributing factor. It has also been noted in the study that teachers who are proficient in using digital platforms have the potential to design engaging lessons targeted at students. Similar studies reported that making appropriate use of technology by course teachers promotes active learning processes and enhances the learning atmosphere (Velandia



Rodriguez et al., 2022). Thus, this engagement is very pertinent in ESP classrooms where content comprehension and application are the main concerns.

3) Assessment and motivation

According to Ramadhani et al. (2022), the digital competence of teachers is crucial for ensuring feedback is provided instantly and motivation levels are boosted. Such teachers are those who make use of digital assessment tools effectively and can provide quick relevant and student-motivating feedback. These findings are consistent with the findings of Nieminen et al. (2023), who found that appropriate and timely feedback provision, which is enhanced by the use of digital devices, inspires students and arouses their interest in learning.

Conceptually, the findings reflect technology's transformational impact on ESP learning. The infusion of educational technology into language instruction has redefined language learning efficiency, beginning with the mode of learning, material accessibility, and evaluations and progressing to learning flexibility, engagement, interactivity, and even developing 21st-century skills. The study additionally recognizes the relevance of lecturer technological expertise in providing ESP students with learning effectiveness, engagement, and classroom interaction, as well as digital competence in delivering assessments while encouraging students. Practically, this study draws attention to the technological, pedagogical, and content knowledge of lecturers and university curriculum developers, as well as university management in this context, intending to equip students with the advantageous and feasible use of educational technology to nurture their balanced skills of using English and surviving with specific contents as demanded by the current business environment.

Conclusion

The findings of this research concluded that digitalization in ESP classes offers several benefits for student learning, including learning content accessibility, assignment efficiency, flexibility, engagement, interaction, motivation, academic skills, and performance improvement, and promoting some of the 21st-century skills. Lecturers' digital competence is also trusted to contribute to students' learning, covering instructional effectiveness, engagement, interaction, assessment, and motivation. To summarize this study, developing a supporting digital environment for higher education learning is strongly recommended by selecting appropriate digital tools, properly infusing the tools into the curriculum and learning with the caveat that all parties involved be adequately trained, and considering students' long-term engagement in the digital environment. Related issues to technology, such as bandwidth and students' technological fatigue, should also be a matter of concern.

Recommendation

Based on this research's findings, educators and university management are encouraged to explore and integrate digital tools that engage students and foster their performance in the context of ESP learning. At the same time, there is a need for both educators and curriculum developers to find ways to apply these tools in the lesson plans, taking into consideration the likelihood of lack of access to technology or other resources and differences in the digital literacy of teachers and students. Moreover, research can explore the effect of continuous ICT training of ESP instructors on students' engagement and retention over time. Other conditions that can facilitate the grounding effect of technology in the teaching of ESP should include problems such as poor network connectivity or low support from the institution regarding technology. Moreover, future studies should address the issue of digital fatigue concerning



students' engagement in constructive activities throughout lessons, which is necessary to reach a healthy stability with the use of learning technologies.

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