

BEYOND READING TASKS: FOSTERING MEANINGFUL LEARNING IN ESP READING THROUGH HUMAN-AI COLLABORATION

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Abstract : *Generative Artificial Intelligence (GenAI) is increasingly used in English for Specific Purposes (ESP) reading education, although its impact on meaningful learning through Human-AI Collaboration is unknown. A study examined how Human-AI Collaboration affects ESP reading education and undergraduate learning. The study includes a qualitative case study of one instructor and fifteen Islamic Education Study Program undergraduates. Data was collected through classroom observation, semi-structured interviews, document analysis, and field notes. The interactive model of Miles, Huberman, and Saldaña was used for data analysis. Human-AI Collaboration recast educators as learning facilitators, students as knowledge architects, and GenAI as a cognitive partner for inquiry and interpretation. AI-supported reading activities improved students' academic text comprehension, inquiry, and confidence in evaluating discipline readings. Human expertise with AI support enabled introspective debate, critical questioning, and self-guided learning so students could make meaningful connections between new and old information. GenAI may become an effective ESP reading pedagogy in higher education through Human-AI Collaboration, according to the findings.*

Keywords : *Human-AI Collaboration; ESP Reading; Meaningful Learning.*

Abstrak : *Kecerdasan Buatan Generatif (GenAI) semakin banyak digunakan dalam pendidikan membaca Bahasa Inggris untuk Tujuan Khusus (ESP), meskipun dampaknya pada pembelajaran bermakna melalui Kolaborasi Manusia-AI masih belum diketahui. Sebuah studi meneliti bagaimana Kolaborasi Manusia-AI memengaruhi pendidikan membaca ESP dan pembelajaran mahasiswa. Studi ini mencakup studi kasus kualitatif terhadap satu instruktur dan lima belas mahasiswa Program Studi Pendidikan Islam. Data dikumpulkan melalui observasi kelas, wawancara semi-terstruktur, analisis dokumen, dan catatan lapangan. Model interaktif Miles, Huberman, dan Saldaña digunakan untuk analisis data. Kolaborasi Manusia-AI mengubah peran pendidik menjadi fasilitator pembelajaran, mahasiswa sebagai arsitek pengetahuan, dan GenAI sebagai mitra kognitif untuk penyelidikan dan interpretasi. Aktivitas membaca yang didukung AI meningkatkan pemahaman teks akademik, penyelidikan, dan kepercayaan diri mahasiswa dalam mengevaluasi disiplin ilmu membaca. Keahlian manusia dengan dukungan AI memungkinkan debat introspektif, pertanyaan kritis, dan pembelajaran mandiri sehingga mahasiswa dapat membuat hubungan yang bermakna antara informasi baru dan lama. Menurut temuan tersebut, GenAI dapat menjadi pedagogi membaca ESP yang efektif di pendidikan tinggi melalui Kolaborasi Manusia-AI.*

Kata Kunci : *Kolaborasi Manusia-AI; Membaca ESP; Pembelajaran yang Bermakna.*

INTRODUCTION

The rapid advancement of generative artificial intelligence (GenAI) has transformed higher education by reshaping how students' access, interpret, and construct knowledge. In English language education, AI-powered platforms such as ChatGPT, Gemini, and Copilot have shifted reading activities from conventional text-based comprehension toward interactive knowledge construction, enabling students to ask questions, receive immediate explanations, summarize complex texts, and critically evaluate information (Hacioglu & Gulhan, 2021; Putri, 2024). Such transformation is especially important in the English for Specific Purposes (ESP) because reading is the matter of not just linguistic competency, but also understanding of discipline-specific texts and professional speech (Siegel et al., 2026; Zuaro, 2023). Therefore, ESP reading instruction is expected not only to improve students' ability to understand texts, but also to foster meaningful learning experiences that encourage critical inquiry, reflection, and active construction of knowledge through collaboration with intelligent technologies.

This is especially true in the complex world of Islamic higher learning. According to Mamad & Vigh, (2024), students in Islamic education programs are expected to engage with academic literature from around the world, while also relating scholarly works written in English to their own field-specific knowledge and to Islamic educational perspectives. Students in many Islamic colleges still participate in traditional reading activities like vocabulary exercises, comprehension questions, and translation projects as part of their English for Specific Purposes (ESP) reading pedagogy, which can make them feel like passive recipients of information (Al Shloul et al., 2024; Yoto et al., 2024). All too often, these methods of teaching limit student-teacher communication, reduce students' interest in and understanding of course material, and ultimately fail to provide better results in the classroom. Rather of focusing on general language education, Khosravi et al., (2023) state that ESP classes should be based on students' real-world academic and occupational requirements. Pedagogical approaches in today's digital learning environments use this notion, allowing students to actively negotiate meaning through interactions with instructors and intelligent learning technology, going beyond contextual resources.

Recent studies have demonstrated the growing potential of Generative AI in language education. Research has shown that AI can support vocabulary development, provide adaptive explanations, generate reflective questions, and enhance students' reading engagement through personalized feedback (Fajriyah et al., 2026). Other studies have reported that AI-assisted learning encourages learner autonomy and improves students' confidence in navigating complex academic texts (Ali et al., 2024; Özeke-Kocabaş &

Koyuncu, 2023). Meanwhile, ESP research has consistently emphasized the importance of contextualized learning materials that align with students' disciplinary backgrounds (Molefi et al., 2024). In Islamic higher education, studies have explored the development of ESP materials incorporating Islamic educational content and reported positive responses regarding learning relevance (Munif et al., 2023; Nurfazri et al., 2026). Collectively, these studies suggest that contextual learning and AI-supported instruction each contribute positively to language learning; however, they have largely been examined independently.

Such advances have taken place, yet inadequacies of a serious nature still persist. Earlier ESP research has mostly concentrated on the creation of teaching materials, the planning of curricula, or the measurement of learning outcomes, without much attention to how meaningful learning takes place in the classroom interaction. Second, the study on Generative AI has focused on its effectiveness as a tool for instruction rather than its potential as a collaborative learning partner to foster critical interpretation, reflection, and dialogue on discipline-specific materials. Third, there is a lack of empirical evidence showing the transformation of students' reading experiences in ESP classes, particularly in Islamic higher education, due to Human-AI Collaboration. Therefore, there is little understanding of how collaboration among students, lecturers and AI impacts on classroom engagement, aids knowledge development and fosters meaningful learning beyond the completion of reading assignments.

Despite these differences, this study explores the possibility of Human-AI Collaboration in moving ESP reading learning from task-based training to meaningful learning within the framework of an Islamic higher education. This study seeks to investigate the following: 1) the adoption of Human-AI Collaboration in ESP reading classrooms; 2) students' engagement with AI-enabled reading activities during the learning process; and 3) the contribution of such a collaboration to meaningful learning through critical inquiry, active participation, and discipline-based knowledge construction. This study explores the pedagogical interactions between lecturers and students with Generative AI using a qualitative case study approach. Such an approach will enable a holistic assessment of the impact of collaborative learning methods on students' experience of reading beyond the usual comprehension tasks.

The uniqueness of this study lies in the reconsideration of the ESP reading process as collaborative and meaning making rather than a sequence of reading tasks to be done for the sake of testing comprehension. This study points to the potential of Human-AI Collaboration as a new pedagogical framework where lecturers, students, and Generative AI collaborate to construct knowledge through conversation, reflection, and critical

engagement with discipline-specific texts. Earlier studies have dealt with contextual ESP materials or AI-assisted language learning in isolation. This study contributes to the existing ESP pedagogy by extending it beyond technology integration to a collaborative learning approach, which emphasizes meaningful learning, critical literacy, and active knowledge building by treating AI as a pedagogical partner rather than an instructional tool. The results are expected to make a theoretical contribution to the ongoing debates on Human-AI collaborative pedagogy in ESP reading and a practical contribution in the form of an evidence-based framework for the development of future-ready ESP reading instruction that is contextually relevant, intellectually engaging, and pedagogically meaningful in higher education.

METHOD

This study employed a qualitative approach using a case study design to investigate how Human-AI Collaboration fostered meaningful learning in English for Specific Purposes (ESP) reading classes at the Islamic Education Study Program, Faculty of Tarbiyah, Fatmawati Sukarno State Islamic University of Bengkulu. A qualitative case study was considered appropriate because it enables researchers to examine educational phenomena within their real-life contexts and to understand participants' experiences, interactions, and meaning-making processes in depth (Creswell & Poth, 2016). Instead of assessing the efficacy of AI through quantitative measures, this research investigated the collaborative interactions between lecturers and students with Generative AI during ESP reading tasks, the influence of these interactions on classroom engagement, and the emergence of significant learning throughout the educational process. Consequently, the research concentrated on comprehending instructional methodologies and the lived experiences of participants within a defined educational context.

One instructor of ESP and fifteen students of the third semester of the Islamic Education Study Program participated. The participants were purposively selected due to their direct experience in using Generative AI in ESP reading instruction for one academic semester (Assyakurrohim et al., 2022). The selected class implemented AI-assisted reading activities in which students interacted with Generative AI to explore vocabulary, clarify disciplinary concepts, generate summaries, formulate critical questions, and discuss English academic texts under the lecturer's guidance. Prior to data collection, all participants received information regarding the objectives of the study, voluntary participation, confidentiality, and the use of research data solely for academic purposes. Written informed consent was obtained from every participant, and anonymity was maintained throughout the research process in accordance with qualitative research ethics.

Data collection involved classroom observations, semi-structured interviews, document analysis and reflective field notes to gain an in-depth understanding of the Human-AI collaborative learning. Classroom observations were focused on the interactions of students with lecturers, peers and Generative AI during ESP reading tasks, focusing on collaborative conversation, critical inquiry, participation and knowledge production. The participants' impressions of AI-supported reading and their learning experiences, possibilities and problems during the collaborative learning process were studied via semi-structured interviews. Supporting documents such as course syllabi, lesson plans, AI assisted learning tasks, students' reflective assignments and classroom learning artifacts were investigated to complement the observational and interview data. The use of numerous data sources, provided for methodological triangulation, which strengthened the reliability and trustworthiness of the conclusions.

Data analysis followed the interactive model proposed by Miles, Huberman, and Saldaña (2014), comprising data condensation, data display, and conclusion drawing and verification. During data condensation, interview transcripts, observation records, documents, and field notes were coded to identify recurring patterns related to Human-AI interaction, meaningful learning, reading engagement, collaborative knowledge construction, and critical literacy practices. The coded data were then organized into thematic categories and displayed through narrative descriptions to facilitate interpretation. Finally, conclusions were developed through iterative comparison across data sources and verified through member checking and source triangulation to ensure the credibility of the interpretations. The thematic analysis was guided by Braun, (2023), enabling the researchers to construct an in-depth understanding of how Human-AI Collaboration transformed ESP reading beyond conventional reading tasks into meaningful learning experiences within higher education.

RESULT AND DISCUSSION

1. Results

a) Human-AI Collaborative Pedagogy in ESP Reading Classrooms

The application of Human-AI Collaboration in ESP reading learning revealed a significant pedagogical change from teacher-led teaching to collaborative knowledge production involving lecturers, students, and Generative AI. Generative AI was not introduced as a self-contained instructional tool, but as a learning companion to guide students through the reading process. Lecturers remained pedagogical facilitators to facilitate critical inquiry, validate AI-generated responses

and foster reflective discussion. The classroom observations revealed that AI-assisted activities were systematically integrated into reading instruction. The AI-assisted activities were identifying the technical vocabulary, clarifying unfamiliar concepts, summarizing academic texts, generating analytical questions, and comparing multiple interpretations of English reading materials. Therefore, the reading activities were extended beyond answering comprehension questions to collaborative learning experiences in which the students actively interacted with the texts, the lecturers, their peers, and with AI to create understanding.

Table 1: Human-AI Collaborative Pedagogy in ESP Reading Classrooms

Interview / Observation Data	Description	Code
Lecturer: <i>"I do not ask students to accept ChatGPT's answers immediately. Instead, they compare the AI responses with the reading text, discuss them in groups, and explain why certain ideas are acceptable or questionable."</i>	Lecturer facilitates critical evaluation of AI-generated responses rather than direct acceptance.	Guided AI Facilitation
Student 3: <i>"When I found unfamiliar educational terms, I first asked AI for an explanation, but afterward our lecturer explained the context and asked us whether the explanation matched the article."</i>	AI supports initial comprehension while the lecturer validates conceptual understanding.	AI-Supported Concept Clarification
Student 8: <i>"Our group used AI to summarize the article, but then we discussed whether the summary reflected the author's main argument."</i>	Students collaboratively evaluate AI-generated summaries through discussion.	Collaborative Knowledge Verification
Lecturer: <i>"AI helps students begin reading difficult texts, but my responsibility is to encourage them to question the information instead of depending entirely on AI."</i>	Lecturer maintains pedagogical authority by promoting critical inquiry.	Facilitated Critical Inquiry
Classroom Observation: Students alternated between reading academic texts, consulting AI, discussing responses with peers, and presenting their interpretations before receiving lecturer feedback.	Dynamic interaction occurred among lecturer, students, AI, and academic texts throughout the learning process.	Triadic Learning Interaction

Table 1 shows that Human-AI Collaboration in ESP reading learning was not a technology-centered educational technique, but a collaborative pedagogical process in which each participant played complementary functions. The findings show a

variety of connected pedagogical aspects that made reading instruction a more involved learning experience than typical.

First, AI facilitation was oriented towards Collaborative learning. Instead of having students take AI results at face value, teachers crafted exercises that had students cross-check the AI answers with the original academic texts and defend their comprehension in class discussions. The teaching style positioned AI as a conversation starter, not as a provider of unassailable knowledge. So, reading comprehension was transformed into an interpretative process in which students learned to examine evidence, negotiate meaning, and defend their argument with disciplinary references.

Second, AI-assisted idea clarification helped students surmount the language and disciplinary problems sometimes confronted in ESP reading. The observation data showed that students mostly used AI to obtain rapid clarification of unfamiliar vocabulary, complicated ideas, and contextual meanings, prior to engaging in lecturer-led conversation. But these explanations did not come easily. Lecturers urged students to verify the AI responses with the source texts and connect them to the holistic picture of Islamic educational studies. The method enhanced conceptual understanding and decreased students' reliance on information provided by AI.

Third, collaborative knowledge verification was defined as a characteristic part of Human-AI Collaboration. Students did not work by themselves, but they reviewed AI-generated summaries, asked for many ways to understand the content, and together agreed on what was the best interpretation of the reading materials. Peer interaction can enable students to spot contradictions, assess diverse views, and collectively reconstruct knowledge. When engaged in collaborative practices, reading activities become moments of negotiating meaning together. Understanding was constructed through the interaction and not retrieved individually.

Fourth, the facilitated critical investigation revealed that teachers still matter in AI-powered classrooms. The teacher encouraged learners not simply to use AI for their course work, but to check AI answers for faults and make conclusions based on facts. We prompted students to dive deeper into the content and read critically and analytically using questions such as "What makes you agree with the AI's reasoning?" and "Which interpretation is more supported by the text?" In these scholastic attempts, AI as cognitive help was acknowledged, and the instructor was the principal motivator for advanced reasoning.

The triadic learning interaction revealed how educators, students and Generative AI co-created meaningful ESP reading together. Students in the classroom were spotted searching for artificial intelligence (AI), walking around the books, collaborating on ideas, and receiving professor feedback before deciding on their readings. In this cyclical process of learning, classroom activities changed from individual reading tasks to the joint building of knowledge. Rather than displacing human interaction, generative AI provides opportunities for discussion, reflection, and critical engagement, enabling students to become more active participants in the interpretation of academic texts.

Thus, the results suggest that Human-AI Collaborative Pedagogy has redefined the ESP reading teaching as a shared knowledge generation process rather than a teacher-centered information transmission. Lecturers' pedagogical guidance, students' active engagement, and AI's support established a lively learning environment that promoted critical engagement with academic texts and laid a pedagogical foundation for meaningful learning in ESP reading classes.

b) AI-Supported Reading Engagement: From Passive Reading to Interactive Learning

The data showed that Human-AI Collaboration had a substantial influence on students' involvement in ESP reading learning. Before the advent of AI-assisted learning, classroom reading activities were mainly passivized, where students read the book mainly alone, wait for the explanation from the lecturers and only answer when asked direct questions. Generative AI also produced a more interactive learning environment, prompting students to actively interact with novel concepts, ask questions, discuss alternate interpretations, and cross-check material gathered by AI with lecturers and peers. AI was not only a technological tool but an interactive learning companion that aroused students' curiosity and facilitated continual involvement throughout the reading process.

Interview data indicated that students experienced noticeable changes in the way they approached English academic texts. Several participants explained that they were no longer intimidated by lengthy ESP readings because AI enabled them to obtain immediate clarification of unfamiliar vocabulary and complex concepts. One student explained that *before using AI, reading English articles often stopped whenever unfamiliar words appeared, whereas AI helped explain difficult terms instantly, allowing the reading process to continue without losing the overall meaning of the text*. Another student said that the confidence of asking questions grew with AI, because students could explore several explanations themselves before confronting the instructor with them.

Meanwhile, the professor said students were far more involved in voicing their thoughts during classroom discussions as they had prior knowledge from encounters with AI. The classroom observations supported the interview findings. Students were observed taking turns to read the prescribed text, seeking clarification from AI, discussing AI generated comments with fellow group members and asking follow-up questions of the professor during many learning sessions. These interactions created a livelier classroom atmosphere compared to conventional reading sessions which usually involved waiting for the speaker to provide direct explanation.

The results of the interview and observation suggested that a chain of related learning experiences boosted students' involvement in reading, and the reading was turned into interactive learning. The first was active inquiry, which was shown to be an essential indicator of the students' increasing participation. Students were involved in the active process of question creation in connection with the English literature and AI, rather than passively absorbing knowledge from the speaker. Students often asked the lecturer follow-up questions to clarify facts, compare alternate interpretations or deepen their conceptual understanding after the AI-generated explanations. AI was more likely to foster inquiry than replace involvement in classrooms; questioning was a significant aspect of students' reading processes.

The learning process reflected developing confidence in reading academic texts. Many students' first impression was that ESP reading materials were linguistically difficult as they used technical jargon and complex grammatical constructs. AI-assisted explanations helped overcome these first difficulties, allowing students to engage with the academic material more confidently. Importantly, it was not the fact that AI provided them with the answers that gave them confidence, but the feeling that they were being encouraged in their first knowledge which enabled them to participate more actively in the follow-up class discussions.

Classroom observations showed that debates were more dialogic when students compared AI-generated responses with textual evidence and expressed alternative opinions before reaching consensus. The discussion moved beyond the simple confirmation of right answers to become joint studies in which students interrogated each other's interpretations, marshalled evidence from the literature to support their views, and extended their thinking through mutual reasoning. This has led to a shift in the character of classroom engagement from a predominantly lecturer-led communication to a collaborative discussion amongst students, lecturers and AI.

Artificial intelligence helps pupils solve linguistic problems that hinder them from accessing English academic materials. The interview data revealed that students often stopped reading to check unknown words in traditional dictionaries, which impaired their understanding and reduced their interest. The AI offered definitions, contextual explanations, and use examples that helped students keep their reading consistent. The immediate linguistic support allowed pupils to focus more cognitive resources on understanding ideas and arguments rather than simply on language.

Another significant result of AI-assisted engagement was the increased desire to read scholarly material. Students were more inclined to read journal articles and discipline-specific resources since they perceived the reading process to be less scary and more manageable. Additional observational data indicated that students went above the essential educational needs, such as comparing several sources, broadening classroom discussions, and exploring more sections of prescribed books. Such activities highlight the ways in which artificial intelligence improved students' reading skills and raised their interest in reading actual academic material.

The results reveal that Human-AI Collaboration brought about considerable modifications to students' participation in ESP reading learning. The introduction of AI has made students more active participants in the process, rather than passive consumers of textual information, as they questioned, interpreted, discussed, and evaluated academic literature together. AI did not increase dependence on technology, but rather acted as a pedagogical scaffold that enhanced students' confidence, sustained their willingness to read, stimulated critical engagement and created a more engaging learning environment. The findings also show that the meaningfulness of participation in ESP reading is not due to AI per se but to the collaborative interactions between students, lecturers, academic texts and intelligent technologies in the learning process.

c) Beyond Reading Tasks: Human-AI Collaboration Fosters Meaningful Learning

The results showed that Human-AI Collaboration broadened the goal of ESP reading from accomplishing comprehension tests to enriching meaningful learning experiences. Students engaged in higher cognitive processes of critical inquiry, reflective interpretation, and collaborative knowledge building rather than merely recognizing major concepts, solving comprehension questions, or interpreting unfamiliar jargon. Generative AI was used as an intellectual scaffold in the learning process to prompt students to question, compare and analyse knowledge, as well as constant facilitation of reflection and encouraging evidence-based reasoning from

lecturers. Thus, ESP reading grew into an active meaning making process by the ongoing interaction of students with academic books, classmates, lecturers, and AI.

Table 2: Beyond Reading Tasks: Human-AI Collaboration Fosters Meaningful Learning

Interview / Observation Data	Description	Code
Student 4: <i>"AI sometimes gives different explanations from my initial understanding. I usually reread the article and compare both interpretations before deciding which one is more appropriate."</i>	Students critically compare AI-generated responses with evidence from academic texts before accepting information.	Critical Inquiry
Lecturer: <i>"I always ask students to explain why they agree or disagree with AI's response. The important thing is not the answer itself, but the reasoning behind it."</i>	The lecturer facilitates reflective questioning to encourage evidence-based reasoning and analytical thinking.	Reflective Facilitation
Student 10: <i>"During group discussions, we often debate whether the AI explanation really matches the author's ideas. Everyone contributes different arguments."</i>	Collaborative discussions promote active participation and negotiation of meaning among students.	Collaborative Knowledge Construction
Student 7: <i>"Reading is no longer just about understanding English. We also relate the article to concepts in Islamic education, so the discussion becomes more meaningful."</i>	Students connect English academic texts with disciplinary knowledge to construct contextual understanding.	Discipline-Based Learning
Classroom Observation: Students compared AI-generated summaries with the original article, identified inconsistencies, justified their interpretations using textual evidence, and revised conclusions after receiving feedback from peers and the lecturer.	Meaningful learning emerged through iterative cycles of reflection, verification, and collaborative interpretation rather than task completion.	Reflective Meaning-Making

Table 2 presents empirical evidence demonstrating the development of meaningful learning through Human-AI Collaboration in ESP Reading. The findings demonstrate that students actively construct understanding by critiquing AI-generated responses, negotiating meaning through collaborative discussions, reflecting on scientific concepts, and validating their interpretations based on academic texts. The figures presented after this table complement these findings by

providing visual evidence of the learning interaction process that illustrates the pedagogical practices summarized in the table.



Figure 1: Pedagogical Approach Best Fosters Meaningful Learning Through AI

The results in Table 2 and the example provided in Figure 1, indicate that meaningful learning in AI-supported ESP reading was the result of the dynamic interaction of lecturers, students, academic texts, and Generative AI. The image shows the constant interaction of these four aspects in the learning process and the table shows the empirical evidence of the pedagogical techniques seen in the classroom implementation. Rather than approaching reading as an activity to find the right answers, students constructed understanding through questioning ideas, engaging in dialogue with peers, reflecting on alternative perspectives and interpreting disciplinary concepts with the support of lecturers and AI. The exchange reconfigured reading as a process of knowledge construction in which AI was not a replacement for human thought but a cognitive partner. The information from the figure and the table together suggests that meaningful learning proceeded through interdependent educational practices that promoted active involvement, critical inquiry, reflective interpretation, and integration of new knowledge with students' prior understanding.

First, Critical inquiry. The results showed that Human-AI Collaboration made students critical readers rather than passive consumers of knowledge. Rather than adopting AI-generated answers at face value, students compared AI responses to actual academic articles, examined the evidence behind the assertions, and considered various interpretations before arriving at their own findings. This strategy helped learners develop analytical thinking skills and improve their ability to distinguish between information retrieval and evidence-based reasoning. Reading was a process of questioning, of confirming and expanding understanding.

Second, reflective facilitation. To have the learners think about their rationale rather than merely the proper response was the importance of the instructor in the educational process. Through insightful questioning and detailed debate, with students offering textual evidence to back up their opinions, students were asked to indicate their agreement or disagreement with AI-generated responses. This style of facilitation enhanced metacognitive awareness, enabling students to evaluate their cognitive processes and rate the trustworthiness of information provided by AI.

Third, co-construction of knowledge. The classroom conversation was no longer a consumption of knowledge by individuals, but a collaborative deliberation. The students debated, challenged each other's views, and shaped their interpretations together until they reached consensus on their conclusions. Artificial intelligence was an extra well of ideas feeding into the conversation, while teachers kept the joint effort grounded in academic study. This engagement changed reading activities into spaces of collective interpretation and scholarly dialogue.

Fourth, discipline-based learning. The research demonstrates that the English texts served not only as tools for language learning for students but also as a framework for interpreting their knowledge in Islamic education. The students developed an enhanced grasp of the principles and the practical implications of the reading exercises through the integration of topics found in English academic publications, educational theories, and professional contexts. This contextualization integrated language skills and domain literacy, strengthening the core assumption of ESP instruction.

Fifth, reflective significance construction. Several changes in students' perceptions were seen in the classroom because of conversations with their colleagues, professors, and artificial intelligence. This dynamic process of data comparison, feedback giving, and knowledge reconstruction demonstrates that actual learning occurred through continuous reflection rather than memorizing or completing tasks. According to the findings, Human-AI Collaboration increases students' engagement in cognitive tasks, allowing them to develop into introspective, autonomous, and analytical readers capable of collaborative knowledge production.

These findings show that Human-AI Collaboration has transformed ESP reading from a goal-oriented task to a valuable educational experience. A learning environment was created in which students actively engaged with scholarly texts, critically evaluated information, and expanded their understanding through ongoing interaction with instructors, classmates, and Generative AI, incorporating critical

investigation, reflective guidance, collaborative knowledge creation, subject-specific education, and reflective interpretation.

2. Discussion

The results demonstrate that Human-AI Collaboration promotes ESP reading learning via a progressive pedagogical process. These three results show how students learn in an integrated fashion, with lecturers' collaborative pedagogy leading to increased student involvement and, ultimately, meaningful experiences in the classroom. According to Lehl et al., (2021) and Molefi et al., (2024), Generative AI's potential as an educational tool lies less in its ability to answer questions or simplify reading tasks and more in its ability to facilitate collaborative knowledge construction alongside intentional pedagogical guidance. As a result, ESP reading evolves from a comprehension-based lesson into a process that includes inquiry, reflection, conversation, and disciplined meaning-making.

The most important finding is the transformations that occur in the learning process for teachers and students when humans and AI work together. Generative AI is not intended to replace teachers, but to supplement them; teachers will still be needed to guide students in the initial stages of text exploration, and to provide context, fact-check, and encourage critical thinking (Saihi et al., 2024; Zhao & Dang, 2026). This finding aligns with social constructivism, which posits that information is not simply transmitted by teachers to students but rather constructed through interaction (Choi et al., 2026; Freise & Ritz, 2024). Within this context, students collaborate to make sense of the world by interacting with professors, peers, course materials, and artificial intelligence (AI) replies. In the collaborative learning ecosystem, where understanding is socially and cognitively constructed, the role of AI is more than a technological assistance (Dias et al., 2024; Hacioglu & Gulhan, 2022). These results further reflect Vygotsky's notion of scaffolding in which students can attain higher order understanding with appropriate instructional aids. Lecturers provided educational scaffolding by encouraging thought, inquiry, and evidence-based reasoning; artificial intelligence provided adaptive cognitive scaffolding by explaining new ideas and generating alternative explanations.

The collaborative pedagogy in classroom then resulted in significant changes in students' participation in learning. Unlike traditional ESP reading instruction, in which students seem to assume a passive role of information recipients, Human-AI Collaboration encouraged learners to actively participate in questioning, verifying AI-generated information, discussing alternative interpretations, and defending their arguments with textual evidence. The study supports Student Engagement Theory,

where engagement is defined as the interplay of behavioural, cognitive and emotional participation in learning (Caruelle et al., 2024; Velicu et al., 2022). AI eliminated language barriers that had previously prevented students from reading complicated academic materials and allowed them to spend more time on analysing concepts and participating in classroom discussions. Thus, engagement was enhanced not because of the ease of learning with AI but rather because of the increase in students' confidence, curiosity, and readiness to communicate with both academic texts and other participants in the learning process.

The heightened of engagement ultimately cultivated substantial learning, which constitutes the primary contribution of this research. The results suggest that students have shifted their perspective on ESP reading from merely answering comprehension questions to engaging in a process of developing discipline knowledge through critical examination and reflective discussion (Bulut, 2026; Claravall et al., 2026; Xu et al., 2024). This change closely corresponds with Ausubel's Meaningful Learning Theory, which asserts that meaningful learning transpires when new information is actively integrated with learners' pre-existing cognitive frameworks (Abah & Vilakazi, 2026; Pratama et al., 2026). Learners consistently connected English academic literature to principles in Islamic educational studies, assessed AI-generated interpretations with textual support, and reformed their comprehension through cooperative dialogue (Mundiri et al., 2026; Sania et al., 2026). These activities demonstrate that comprehension was achieved through interpretation and reflection instead of rote memorizing, thus broadening ESP reading from linguistic practice to encompass disciplinary and critical literacy. In this context, Generative AI functioned not merely as a source of information but as a stimulus for enhanced cognitive involvement that prompted students to inquire, analyse, and collectively recreate meaning.

These findings both confirm and extend previous studies concerning AI-assisted language learning. Earlier research has consistently reported that Generative AI enhances vocabulary acquisition, reading comprehension, personalized feedback, and learner autonomy. Similarly, ESP research has emphasized that contextualized learning materials improve students' academic relevance and motivation (Bonanati & Buhl, 2022). However, most of the past research has been focused either on AI as an instructional tool or on ESP as a contextual approach to language learning. The current work combines both viewpoints by proposing that meaningful ESP reading occurs because of Human AI Collaboration rather than merely contextual materials or artificial intelligence (AI) technology. Thus, the novelty of this research is the proposal of Human-AI Collaboration

as a collaborative instructional framework in which lecturers, students, AI, and disciplinary texts all engage in knowledge building. This view reframes the present discourse from technological adoption to pedagogical reform, positing that the success of AI is intrinsically tied to its orchestration in collaborative learning contexts.

The findings have implications for the future development of ESP pedagogy in higher education. When integrating generative AI into reading teaching, the intent should not be to increase reading efficiency or speed of comprehension, but rather to create opportunities for critical inquiry, dialogue, and collaborative knowledge building. Lecturers consequently remain important as pedagogical designers who govern AI use, develop critical thinking and guarantee that students assess rather than simply accept AI-generated content. This study, therefore, recommends a pedagogical change from AI-assisted reading to Human-AI Collaborative Meaningful Learning, where technology supports rather than replaces human engagement. This framework provides an innovative and future-oriented form of ESP reading instruction that can promote, at once, disciplinary literacy, critical thinking, collaborative learning, and meaningful involvement in higher education.

CONCLUSION

This study discovered that human-AI collaboration transforms ESP reading education from a task-centered approach to one that delivers meaningful learning opportunities. The results show a shift in education. Instructor-led collaborative learning powered by Generative AI kicks off a human-AI cooperative pedagogy, boosts student reading engagement, and, ultimately, encourages meaningful learning. Generative AI is not a replacement for educators; rather, it is a versatile educational tool that helps clarify ideas, produces critical questions, develops teamwork, and stimulates critical study of academic texts. As a result, ESP reading entails more than just acquiring words and comprehending texts. Students actively examine, evaluate, and contextualize disciplinary texts within their academic settings.

This study advances theory and practice by proposing Human-AI Collaborative Meaningful Learning as a novel framework for teaching English reading for specific goals in higher education institutions. Unlike previous studies, which primarily focused on AI as a teaching tool or ESP as a contextual language learning method, this study shows that integrating AI in ESP classrooms is dependent not only on disciplinary literature, but also on educators' pedagogical support, student engagement, and Generative AI in collaborative educational environments. To better comprehend this framework's capabilities to enable future-oriented language teaching, more research should be performed in the realms of ESP,

educational environments, and AI systems.

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