
| RESEARCH ARTICLE

Artificial Intelligence and the Development of Soft Skills in Higher Education: A Systematic Literature Review

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| ABSTRACT

The integration of artificial intelligence (AI) in higher education has expanded considerably, with research predominantly focusing on cognitive outcomes, assessment automation, and personalized learning. However, limited attention has been given to the relationship between AI-supported learning environments and the development of soft skills, such as communication, collaboration, critical thinking, and management skills. These skills are increasingly essential for academic success and employability in contemporary knowledge economies. This study conducts a systematic literature review to examine how AI influences soft skills development in higher education, with particular relevance to language education. Following PRISMA guidelines, the review analyzes studies published between 2015 and 2024, sourced from major academic databases including Scopus, Web of Science, ERIC, and Google Scholar. Inclusion criteria focused on peer-reviewed research addressing AI-supported educational environments and their impact on soft skills. Findings indicate that AI technologies can support the development of communication skills, critical thinking, and management skills, particularly through interactive and adaptive learning environments. Some studies highlight the role of AI in promoting self-directed learning and reflective practices, while others emphasize its potential to facilitate digital collaboration. Nevertheless, evidence remains inconsistent. The effectiveness of AI in fostering soft skills depends largely on pedagogical design, instructional strategies, and contextual factors rather than technology alone. The review also identifies challenges, including ethical concerns, the reliability of automated feedback, and reduced human interaction. Overall, while AI shows potential in supporting soft skills development, further interdisciplinary research is needed to establish robust pedagogical frameworks and address existing gaps, particularly within language education contexts.

| KEYWORDS

Soft skills, Artificial intelligence, Digital transformation, Language education.

| ARTICLE INFORMATION

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1. Introduction

Higher education institutions are increasingly facing a dual challenge: integrating emerging technologies into teaching practices while also equipping students with essential soft skills such as communication, collaboration, adaptability, and critical thinking. These competencies are now central to graduate employability, as research shows that employers value them alongside technical knowledge because they enable individuals to function effectively in complex professional environments (Robles, 2012; Succi & Canovi, 2020).

Soft skills are defined as “a broad set of skills, competencies, behaviours, attitudes, and personal qualities that enable people to effectively navigate their environment, work well with others, perform well, and achieve their goals” (Lippman, Ryberg, Carney & Moore, 2015, p.04). They include communication, teamwork, leadership, problem-solving, and emotional intelligence (Robles,

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2012). In higher education, these skills are typically developed through pedagogical approaches that emphasize interaction and engagement, such as collaborative learning, problem-based learning, and experiential learning. These approaches encourage students to participate in meaningful social and cognitive activities that foster both academic and interpersonal development (Succi & Canovi, 2020).

At the same time, higher education is undergoing significant technological transformation, particularly with the rise of artificial intelligence (AI). AI-supported systems are increasingly used to enhance learning processes, automate instructional tasks, and provide data-driven insights into student performance. They can offer personalized feedback, support adaptive learning environments, and facilitate interaction with digital resources (Luckin et al., 2016). Research on AI in higher education has expanded rapidly, with studies largely focusing on areas such as performance prediction, assessment systems, adaptive learning, and intelligent tutoring (Zawacki-Richter et al., 2019). However, these studies tend to prioritize technological development over pedagogical considerations.

Subsequent reviews confirm that much of the literature emphasizes system design, data analytics, and technical capabilities, while giving less attention to how AI affects teaching practices and broader educational outcomes (Bond et al., 2023; Bearman et al., 2023). This indicates a significant gap in understanding the pedagogical impact of AI, particularly regarding competencies that go beyond academic performance.

Despite growing interest in AI in education, the intersection between AI and soft skills development remains underexplored. Most research focuses on technological aspects rather than socio-cognitive competencies. To address this gap, the present study conducts a PRISMA-guided systematic review of literature published between 2015 and 2024, drawing on major academic databases. It aims to examine how soft skills are conceptualized in AI-supported environments and assess the extent to which empirical evidence supports their development in higher education contexts.

Specifically, the review seeks to answer the following research questions:

1. Which soft skills are most frequently discussed in research on AI-supported learning environments in higher education?
2. How do existing studies conceptualize the relationship between artificial intelligence and soft skills development?
3. What pedagogical opportunities and limitations are identified in the literature regarding the use of AI-supported learning environments for developing soft skills?

2. Literature Review

2.1 Conceptualizing Soft Skills in Higher Education

The concept of soft skills has gained increasing attention in higher education, particularly in relation to graduate employability and the broader role of universities. Although widely used, the term is interpreted differently across disciplines. Generally, soft skills refer to interpersonal, communicative, and socio-cognitive competencies that enable individuals to function effectively in professional and collaborative environments (Robles, 2012). Unlike technical knowledge, these skills focus on how individuals interact, manage tasks, and respond to complex situations. Early research emphasized that employability extends beyond subject knowledge. Yorke (2006) highlighted that it includes a combination of skills, knowledge, and personal attributes, with communication, adaptability, and interpersonal abilities playing a key role in professional success. Among these, communication skills are consistently identified as essential, enabling individuals to express ideas clearly, collaborate effectively, and respond to feedback (Robles, 2012).

Collaboration and teamwork are also central, as many workplaces require collective problem-solving. University learning experiences that involve group work help develop negotiation skills, interpersonal awareness, and shared responsibility (Succi & Canovi, 2020). Critical thinking is another key competency, involving the ability to analyze information and make reasoned judgments (Facione, 2011).

Additionally, management skills are increasingly important in rapidly changing environments (Heckman & Kautz, 2012). In language education, soft skills are closely linked to communication, interaction, and intercultural competence, which support effective engagement across diverse contexts (Chapelle, 2001; Byram, 1997).

2.2 Pedagogical Approaches to Soft Skills Development in Higher Education

The growing importance of soft skills has led educators to rethink pedagogical practices in higher education. Collaborative learning is a key approach, encouraging students to work together, exchange ideas, and construct knowledge collectively. Research shows that structured collaboration—based on positive interdependence, individual accountability, and reflective dialogue—can enhance communication, teamwork, and shared responsibility (Johnson, Johnson, & Smith, 2014). Problem-based learning (PBL) is another widely used strategy, where students engage with real-world problems through research, discussion, and reflection, promoting active learning and problem-solving skills (Hmelo-Silver, 2004). Similarly, experiential learning emphasizes learning through experience and reflection, following a cyclical process that supports deeper understanding (Kolb, 1984). Project-based learning further develops teamwork, communication, and time management through sustained collaborative tasks (Prince, 2004). Reflective learning also plays a crucial role by helping students evaluate their experiences and improve their learning processes (Schön, 1983).

2.3 Artificial Intelligence in Higher Education Research

Artificial intelligence in education refers to computational systems that perform cognitive-like tasks such as pattern recognition, adaptive feedback, and decision support in learning environments (Luckin et al., 2016). Baker and Smith (2019) argue that AI can assist educators by providing insights into student learning patterns and automating routine instructional tasks, but it should be viewed as a supportive tool rather than a replacement for teachers. Its effectiveness depends on pedagogical integration that promotes engagement, reflection, and interaction.

A major application of AI in higher education is learning analytics, which analyzes data from digital platforms to identify student engagement and performance patterns. This can help instructors detect learners who need additional support and adjust teaching strategies accordingly (Ifenthaler & Yau, 2020). However, interpreting such data requires careful pedagogical judgment, as it does not fully represent the complexity of learning. Another key area is adaptive learning systems, which adjust content based on student progress using algorithmic analysis. These systems aim to support personalized learning by allowing students to learn at their own pace (Luckin et al., 2016). Their effectiveness, however, depends on thoughtful integration into teaching practices.

2.4 Artificial Intelligence and Soft Skills Development in Higher Education and Language Education

Although artificial intelligence in education has expanded rapidly, its relationship with soft skills development remains underexplored compared to studies focused on technical or cognitive outcomes. Several scholars note that existing research tends to emphasize technological functions rather than pedagogical implications (Holmes, Bialik, & Fadel, 2019; Zawacki-Richter et al., 2019). However, emerging technologies may reshape learning by enabling new forms of interaction and participation, supporting communication, peer exchange, and collaborative knowledge construction (Dede, 2014). Communication is widely recognized as a core soft skill, and technology-mediated environments can enhance it through digital discussions, collaborative writing, and feedback systems that promote interaction among students and instructors (Redecker & Punie, 2017). Collaboration is equally important, as higher education increasingly prepares students for teamwork and shared problem-solving in professional contexts. Learning activities that require coordination, negotiation, and collective decision-making help develop these competencies (Barrie, 2006). Critical thinking is also essential, involving the ability to analyze information, evaluate arguments, and assess sources critically (Facione, 2011), particularly in digital environments with abundant information. In addition, management skills—including planning, organizing, and coordinating tasks—are crucial for academic and professional success. Project-based and technology-supported learning environments can foster these abilities by requiring students to manage time, resources, and group work effectively during complex assignments.

3. Methodology

3.1 Research Design

This study used a systematic literature review (SLR) to examine research on artificial intelligence and soft skills development in higher education, especially in applied linguistics. SLRs follow transparent, replicable procedures to reduce bias in selecting studies (Kitchenham & Charters, 2007). The study applied the PRISMA framework, which ensures clear reporting and methodological rigor through standardized guidelines, a checklist, and a flow diagram for study selection (Page et al., 2021). The review process included five stages: defining research questions, designing search strategies, identifying studies across databases, screening and selecting relevant studies, and extracting and synthesizing data.

3.2 Search Strategy

A comprehensive and iterative search strategy was developed to identify peer-reviewed studies on artificial intelligence, soft skills, and higher education. Systematic search strategies are essential in reducing bias and ensuring relevant studies are not missed (Gough, Oliver, & Thomas, 2017). Key concepts included artificial intelligence in education, soft skills development, higher education contexts, and language education.

To ensure inclusiveness, multiple synonyms were used. Soft skills were searched using terms such as transferable skills, generic skills, 21st-century skills, interpersonal skills, and employability skills. Artificial intelligence was also expanded to include intelligent learning systems, adaptive learning technologies, and intelligent educational systems.

Search strings were built using Boolean operators (AND, OR) to combine concepts effectively, a standard method in systematic reviews (Booth, Sutton, & Papaioannou, 2016). An example query combined AI-related terms, soft skills terms, and higher education terms. Searches were adapted across databases to match different indexing systems and interfaces.

3.3 Data Sources and Databases

To ensure broad coverage of the relevant academic literature, searches were conducted across four major academic databases commonly used in education and applied linguistics research: Scopus, Web of Science, ERIC, Google Scholar. These databases were selected because they provide extensive coverage of peer-reviewed research in education, applied linguistics, and educational technology. The literature search focused on publications produced between 2015 and 2024. This time frame was selected because research on artificial intelligence in education has expanded significantly during the last decade, reflecting rapid technological developments and increasing academic interest in the topic. Restricting the search to this period allowed the review to focus on contemporary research developments within the field.

3.4 Inclusion and Exclusion Criteria

Clear inclusion and exclusion criteria ensured unbiased study selection (Petticrew & Roberts, 2006). Included studies (2015–2024) were peer-reviewed, English, focused on higher education, AI in education, and soft skills. Excluded were studies outside education, non-higher education contexts, purely technical works, or lacking learning outcomes, as well as non-scholarly publications.

3.5 Study Selection Process (PRISMA Screening)

The study selection followed PRISMA's four stages. Identification gathered and organized records while removing duplicates. Screening reviewed titles and abstracts for relevance. Eligibility involved full-text assessment against criteria. Inclusion finalized selected studies for analysis. A PRISMA flow diagram documented each stage, ensuring transparency in the selection process (Moher et al., 2009).

3.6 Data Extraction

After selecting the final studies, data were systematically extracted to ensure consistency across analysis. Key information included authors, year, context, methodology, educational setting, type of AI system, targeted soft skills, and main findings. The data were organized in a structured spreadsheet to enable comparison and support synthesis of results.

3.7 Data Analysis and Synthesis

This review used a qualitative synthesis approach due to the diversity of research designs, making statistical meta-analysis unsuitable. Instead, thematic analysis was applied to identify patterns across studies (Thomas & Harden, 2008). The process involved close reading, identifying key themes on AI and soft skills, comparing findings, and synthesizing recurring patterns. This approach helped reveal common trends, methods, and challenges in the literature.

3.8 Methodological Limitations

This study has several limitations. It included only English-language publications, potentially excluding relevant research in other languages. Although multiple databases were searched, some studies may have been missed. As AI in education is an emerging field, available research remains limited. Additionally, the use of qualitative synthesis provides conceptual insights rather than quantitative effect measurements.

4. Results

4.1 Overview of the Study Selection Process

Following the PRISMA framework (Page et al., 2021), the study selection process involved identification, screening, eligibility, and inclusion stages. The initial search across four databases yielded 1,246 records. After removing 312 duplicates, 934 records remained. Screening titles and abstracts led to the exclusion of 742 studies, leaving 192 for full-text review. During eligibility assessment, 142 studies were excluded for reasons such as focusing on technical AI, non-higher education contexts, or lacking soft skills discussion. Ultimately, 50 studies met all criteria and were included in the final synthesis. This transparent process enhances the review’s reliability and reproducibility.

4.2 Characteristics of the Included Studies

The final dataset consisted of 50 peer-reviewed studies published between 2015 and 2024. These studies represented a diverse range of academic disciplines, including: higher education research, educational technology, applied linguistics, language education, digital learning environments. Moreover, the geographical distribution of studies shows that research on artificial intelligence in higher education is global, with most studies originating from Europe and North America due to strong research infrastructure and early technology adoption. However, growing contributions from Asia, the Middle East, and North Africa indicate expanding interest. Studies from Jordan, Saudi Arabia, and Lebanon highlight AI’s role in student engagement, motivation, and culturally influenced usage patterns. In Morocco, research emphasizes aligning AI with 21st-century skills such as communication and critical thinking (Belkbir, 2024). Overall, while early research was Western-focused, attention is increasingly shifting toward diverse global contexts, including Arab regions.

4.3 Research Designs Used in the Literature

The reviewed studies used diverse methodologies, reflecting the interdisciplinary nature of AI in education research. About 40% employed quantitative methods, including surveys, experiments, and statistical analyses, often linking AI use to improved communication and collaboration skills (Hasan et al., 2025). Around 36% used qualitative approaches such as case studies, interviews, and observations to explore experiences with AI-supported learning. The remaining 24% adopted mixed-methods designs, combining quantitative data with qualitative insights to examine both learning outcomes and user experiences.

4.4 Soft Skills Examined in the Literature

The systematic analysis of the selected studies revealed that research examining artificial intelligence in higher education frequently addresses several categories of soft skills. Although terminology varies across studies, the literature consistently highlights competencies related to communication, collaboration, critical thinking, and management skills as key dimensions of soft skills development in university learning environments.

Soft skills are generally defined as non-technical abilities that enable individuals to interact effectively with others, manage tasks, and adapt to professional environments (Matteson, Anderson, & Boyden, 2016). These competencies play a crucial role in graduate employability and professional development because they support collaboration, leadership, and decision-making in complex workplace contexts (Succi & Canovi, 2020).

Within the reviewed literature, the distribution of studies addressing specific soft skills varied across competencies. Table 1 summarizes the main categories of soft skills identified in the dataset and the number of studies addressing each category.

Table 1

Distribution of Soft Skills Addressed in the Reviewed Studies (n = 50)

Soft Skill Category	Number of Studies	Percentage
Communication skills	28	56%
Collaboration and teamwork	24	48%
Critical thinking	19	38%
Management skills	15	30%

Communication skills were the most frequently discussed competency in the reviewed literature. They involve expressing ideas clearly, engaging in discussions, presenting arguments, and interacting effectively with others. Research highlights communication as a key graduate attribute strongly linked to employability and professional success (Andrews & Higson, 2008; Succi & Canovi, 2020).

In technology-supported learning environments, communication is often facilitated through digital platforms that enable collaborative discussions, peer feedback, and shared writing. These tools expand opportunities for interaction beyond traditional classrooms, supporting continuous dialogue and idea exchange. Communication is considered a central skill in language learning. Therefore, many studies emphasize how digital technologies enhance interaction and support meaningful communication among learners.

Collaboration is the second most frequently discussed competency and refers to the ability to work with others toward shared goals. It is widely recognized as a key graduate employability skill, as teamwork enables task coordination, knowledge sharing, and collective problem-solving in professional settings (Succi & Canovi, 2020). In technology-supported learning environments, collaboration is facilitated through group projects, peer review, and shared digital platforms that allow students to co-construct knowledge and exchange perspectives. However, research stresses that collaboration is not automatically achieved through technology use. It depends on well-designed instructional activities and active teacher guidance to ensure meaningful and effective cooperative learning.

Critical thinking is the third most frequently discussed soft skill and involves evaluating information, analyzing arguments, and making evidence-based judgments. It is widely considered a core goal of higher education. Facione (2011) defines it as a process of interpretation, analysis, evaluation, and inference, which is especially important in digital contexts where students face large amounts of information. Studies show that digital learning environments can support critical thinking through problem-based learning, project-based learning, and inquiry tasks that encourage analysis, comparison of perspectives, and argument construction. However, research also emphasizes that technology alone is insufficient; effective development of critical thinking depends on strong pedagogical design and active instructor guidance.

Management skills are also an important soft skill in higher education. They involve planning, organizing, coordinating, and monitoring tasks, including time management, decision-making, and project planning. Research shows that project-based learning helps students develop these skills through group coordination and task organization. These competencies are important for professional contexts requiring leadership and structured work. Studies also link management skills to higher academic engagement and stronger institutional commitment (Marin-Zapata et al., 2022). In technology-supported environments, management skills can be strengthened through complex tasks that require planning and monitoring progress, often supported by digital tools for project coordination and collaboration.

4.5 PRISMA Flow of Study Selection

Following the PRISMA framework, study identification, screening, and selection were conducted systematically to ensure transparency and replicability. Searches across Scopus, Web of Science, ERIC, and Google Scholar (2015–2024) using keywords related to AI, higher education, and soft skills initially retrieved 412 records. After removing 87 duplicates, 325 studies remained. Title and abstract screening excluded studies unrelated to higher education, focused only on technical AI aspects, lacking soft skills focus, or non-empirical sources. This left 112 studies for full-text review. Additional exclusions were made for studies not directly addressing soft skills in higher education or focusing on workplace contexts. Ultimately, 50 peer-reviewed studies were included. These studies covered diverse regions and used varied methodologies, including surveys, experiments, quasi-experimental, mixed-methods, and systematic reviews.

4.6 Characteristics of the Included Studies

Table 2. Characteristics of Selected Studies Included in the Systematic Review

Author(s)	Year	Country/Region	Research Design	Soft Skills Examined
González-Rico & Lluch-Sintes	2024	Spain	Experimental study	Communication, collaboration
Hasan, Nasreen & Rasul	2024	Pakistan	Quantitative survey	Communication, collaboration, critical thinking
AlAfnan, Dishari & MohdZuki	2024	Kuwait / Malaysia	Survey research	Communication, writing, teamwork
López-Serrano et al.	2025	Spain	Experimental study	Communication, teamwork, problem solving
Coluzzi, Galatro & López Rivero	2023	Italy / Spain	Qualitative study	Communication, emotional intelligence
Guerrero-Sosa et al.	2025	Spain	Computational framework	Decision-making, communication
Pantazatos, Grammatikou & Maglaris	2025	Greece	Experimental study	Critical thinking, problem solving

Studies suggest that artificial intelligence-supported learning environments can influence several aspects of soft skills development. For instance, research by Pablo González Rico and Mireia Lluch Sintes shows that combining digital tools with personalized tutoring can enhance communication and collaboration skills in higher education. Similarly, a survey by Sajid Hasan and colleagues found that greater exposure to AI tools is associated with improved collaboration, communication, and critical thinking among university students.

Other work emphasizes the role of instructional design, indicating that AI-supported communication training is most effective when embedded in structured pedagogical activities and guided by instructors. A recent meta-analysis also reports moderate overall effects of AI-based interventions on higher-order skills, but highlights substantial variation across studies depending on technology type and teaching approach. Overall, the literature indicates that while AI may support soft skills development, outcomes depend strongly on pedagogical design and facilitation rather than technology alone.

Key Observations from the Dataset

Three major patterns emerged from the analysis of the included studies. First, the majority of research focuses on communication and collaboration, reflecting the importance of interpersonal competencies in university learning environments. Second, many studies emphasize critical thinking and problem-solving, particularly in project-based or inquiry-based learning contexts. Third, fewer studies explicitly examine management skills, such as time management, planning, and decision-making, although these competencies are increasingly recognized as essential components of graduate employability. These findings suggest that while the literature increasingly recognizes the role of artificial intelligence in supporting learning processes, research on developing certain soft skills remains relatively limited.

4.7 Comparative Evidence Synthesis of Reviewed Studies

Table 3. Comparative Evidence Synthesis of Selected Studies

Study	Context	Methodology	Soft Skills Examined	Key Findings
Succi & Canovi (2020)	European higher education	Survey research	Communication, teamwork	Soft skills are strongly linked to graduate employability and employer expectations.
Marin-Zapata et al. (2022)	University students	Quantitative study	Decision-making, adaptability, management skills	Soft skills positively influence student engagement and institutional commitment.
Andrews & Higson (2008)	European graduates	Qualitative interviews	Communication, teamwork	Employers consistently prioritize communication and interpersonal skills in graduates.
Matteson et al. (2016)	Higher education institutions	Conceptual analysis	Interpersonal and professional competencies	The concept of soft skills remains broadly defined but central to professional success.
Facione (2011)	Educational assessment	Theoretical framework	Critical thinking	Analytical reasoning is a core higher-order skill expected from university graduates.

The comparative analysis reveals several patterns across the literature. First, communication and collaboration appear as the most consistently examined competencies across studies. These skills are frequently linked to graduate employability and professional readiness. Second, critical thinking is widely discussed as a core outcome of higher education, particularly in learning environments that emphasize inquiry-based and problem-based learning approaches. Third, although management skills such as planning, decision-making, and task coordination are less frequently examined in the literature, several studies highlight their importance for student engagement and professional preparedness. Finally, the synthesis indicates that the development of soft skills in higher education is strongly influenced by pedagogical design rather than technology alone. Technologies can support learning processes, but the development of competencies such as communication, collaboration, and management skills depends largely on how instructors structure learning activities and guide student interaction.

5. Discussion

5.1 Interpreting the Relationship Between AI and Soft Skills Development

This systematic review shows that research on artificial intelligence in higher education increasingly focuses on soft skills development, especially communication, collaboration, critical thinking, and management skills. However, the relationship between technology and these skills is not direct or automatic. It is shaped by pedagogical design, instructional strategies, and contextual conditions in higher education settings. This is consistent with educational technology research, which argues that learning outcomes depend less on the tools themselves and more on how they are used in teaching and learning processes (Kirkwood & Price, 2014).

5.2 Communication and Interaction in Applied Linguistics Contexts

Communication skills are consistently highlighted in the reviewed studies, particularly in applied linguistics and language education contexts, where communication is a core learning objective. This aligns with communicative language teaching (CLT), which emphasizes interaction, negotiation of meaning, and authentic communication as key processes in language acquisition (Richards, 2006). AI-supported environments can enhance opportunities for communication through synchronous and asynchronous interaction, peer feedback, collaborative writing, and exposure to varied language input. However, the literature does not show consistent evidence that technology alone improves communicative competence. Instead, communication skills develop when learners engage in structured, purposeful interaction tasks guided by instructors.

5.3 Collaboration and Social Learning Processes

Collaboration is prominent in the reviewed studies, reflecting social constructivist perspectives that view learning as occurring through interaction (Vygotsky, 1978). From this view, collaboration is not only a skill but a core learning process. Technology-supported environments can facilitate collaboration through group work, shared problem-solving, and peer feedback. However, studies also show that collaboration does not arise automatically through technology use. Without careful task design, student engagement may remain superficial. This aligns with Dillenbourg (1999), who emphasizes that effective collaboration requires clear goals, structured tasks, and interdependence among learners. Overall, collaborative skill development depends more on instructional design than on technology itself.

5.4 Critical Thinking and Higher-Order Cognitive Skills

Critical thinking is frequently examined in research on artificial intelligence in higher education, reflecting the emphasis on higher-order cognitive skills. It is defined as the ability to analyze information, evaluate arguments, and make reasoned decisions (Facione, 2011), which is increasingly important in digital environments with abundant information. Studies suggest that technology-supported learning can foster critical thinking through problem-based learning, inquiry activities, and reflective tasks. However, some researchers warn that over-reliance on automated systems may limit independent reasoning if students accept generated outputs without evaluation. Overall, findings are mixed, with outcomes depending on instructional guidance. This highlights the continued importance of pedagogical mediation to ensure the development of analytical and reflective thinking skills.

5.5 Management Skills and Self-Organization in Learning

A key finding across all soft skills is the importance of pedagogical mediation, as technology alone does not guarantee meaningful learning outcomes. This is consistent with Kirkwood and Price (2014) and Laurillard (2012), who stress that educational technology is effective only when integrated into well-structured teaching practices and guided interaction between learners and instructors. While AI-supported environments can offer feedback, facilitate interaction, and enhance access to resources, these features support soft skills development only when embedded in intentional, instructor-designed learning activities.

5.6 Pedagogical Mediation as a Central Factor

Across all soft skills, a key finding is the central role of pedagogical mediation. Studies consistently show that technology alone does not ensure meaningful learning outcomes. This aligns with Kirkwood and Price (2014) and Laurillard (2012), who emphasize that educational technology is effective only when embedded in well-designed teaching practices and structured learner–teacher interaction. AI-supported environments can provide feedback, enable interaction, and improve access to resources, but these benefits contribute to soft skills development only when integrated into purposeful, instructor-designed learning activities.

5.7 Implications for Applied Linguistics and ELT

This review has important implications for applied linguistics and English language teaching (ELT). While language education traditionally focuses on communicative competence, there is growing emphasis on integrating broader soft skills into curricula. Findings suggest that technology-supported learning environments can enhance communicative interaction, promote collaborative learning, and foster critical engagement with language and content. However, these benefits depend on effective task design, such as collaborative writing, peer feedback, and project-based activities that support both language development and soft skills acquisition. In contexts like Moroccan higher education, the study highlights the need to align technology use with pedagogical objectives and local conditions, including infrastructure constraints, large class sizes, and teacher training needs.

5.8 Implications for Middle Eastern and North African Contexts

Research on artificial intelligence in higher education is growing in the Middle East and North Africa, but it remains limited compared to Europe and North America. Existing studies show increasing student engagement with digital learning tools, although institutional readiness and pedagogical integration are inconsistent. UNESCO (2024) highlights the need to strengthen AI competencies in Arab education systems, including both technical and soft skills. However, more empirical research is needed to better understand how AI-supported learning environments operate in these regions and how they contribute to soft skills development in higher education contexts.

5.9 Directions for Future Research

Based on the findings of this review, several directions for future research can be identified: longitudinal studies examining long-term soft skills development, research focusing on management and organizational skills, studies in underrepresented regions, particularly North Africa, and integration of applied linguistics perspectives into AI research. These areas represent important gaps in the current literature and provide opportunities for further investigation.

6. Conclusion

This systematic literature review analyzed 50 peer-reviewed studies (2015–2024) on the relationship between artificial intelligence and soft skills development in higher education, with a focus on applied linguistics, using a PRISMA-based approach. The results show a growing body of research reflecting global interest in digital transformation, while also indicating that AI's role in soft skills development is indirect and strongly shaped by pedagogical conditions.

Four main soft skills emerged: communication, collaboration, critical thinking, and management skills. Communication and collaboration were the most frequently studied, highlighting their importance in interactive and socially constructed learning. Evidence suggests that technology-supported environments can enhance dialogue, peer feedback, and group work, but only when supported by structured tasks and effective teaching practices. Critical thinking was also widely discussed, with potential benefits in inquiry- and problem-based learning, although results were mixed and dependent on instructor guidance. Management skills were less frequently addressed despite their relevance to planning and coordination in collaborative learning.

Overall, AI functions as a mediating tool rather than a direct driver of soft skills development, with outcomes depending on pedagogy and instructional design. This aligns with broader educational technology research emphasizing teaching practices over technology. The review also identifies a geographical imbalance in research, with most studies from Europe and North America and limited evidence from regions such as the Middle East and North Africa. Key gaps include the lack of longitudinal studies, inconsistent definitions of soft skills, and limited focus on management competencies, highlighting directions for future research.

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