

Discussing ChatGPT in the Landscape of Students' Soft Skill Fostering: A Bibliometric Content Analysis

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Abstract

Since its launch, ChatGPT has prompted an extensive debate among scholars and educators regarding its benefits and impediments to the development of students' soft skills. Aiming to provide a comprehensive overview of this dynamic, this study performed a dual approach, combining bibliometric and content analysis. A total of 136 peer-reviewed articles from Web of Science and Google Scholar published between 2022 and April 2025 were analyzed. The bibliometric analysis revealed a rapid growth in this field, with significant research originating from China, Taiwan, Saudi Arabia, and the United States. Content analysis of 102 empirical studies then delved into research subjects, methods, and key themes. A significant gap in research on K-12 students was discovered, as the majority of studies targeted higher education stakeholders. Moreover, while there was a focus on the impacts of ChatGPT on students' academic communication abilities and high-order thinking skills, the review identified a growing recognition of digital literacy as an essential soft skill in the age of AI. The paper concludes by offering extensive implications and pedagogical strategies, derived from the empirical studies, to guide the integration of ChatGPT in educational settings for the growth of soft skills. This study is among the first to combine bibliometric and content analyses in this research landscape.

Keywords: ChatGPT, soft skills, students, bibliometric analysis, content analysis

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Introduction

The 21st century has witnessed a powerful wave of advancements in technology that is continuously reshaping human life in various ways, from the emergence of wireless Internet to the introduction of artificial intelligence (AI). In a short time, humanity has to adapt and find ways to tackle the challenges presented by these rapid changes.

Under these circumstances, soft skills (SS) are gradually gaining attention from policymakers, educators, and businesses. They are considered essential tools that empower individuals to navigate their personal development and, consequently, cope with uncertain environments and increase perseverance (International Labour Organization, 2021; United Nations Children's Fund [UNICEF], 2019). What's fascinating is that AI innovations are now assisting people in practicing these inherently human SS; among them is ChatGPT.

Within the first two months after its launch, Chat Generative Pre-trained Transformer (ChatGPT) quickly gained beyond one hundred million users (Hu, 2023) and has been recognized as a promising non-human assistant in educational settings since then, particularly in the aspect of personalization and expanding learning resources for learners (Qadir, 2022). The fact that ChatGPT can support human-like tasks, such as learning and decision-making, has opened up new directions for education (Kasneci et al., 2023).

However, researchers express concerns about ethical issues (Mhlanga, 2023), misinformation, and bias (ElSayary, 2023), as well as the risk of students misusing the tool or lacking critical analysis towards the AI-generated content (Kazley et al., 2024; Tseng et al., 2025). Besides, the reliability and consistency of ChatGPT responses can differ depending on the language used by the user, which is often higher when using English than when using other languages (Yoon et al., 2024). This can be a significant barrier for teachers and students in countries where English is not their native language.

Until April 2025, systematic studies have extensively explored the general impact of ChatGPT in education (e.g., Grassini, 2023; Tang & Chaw, 2024), challenges and opportunities of ChatGPT in classroom settings (e.g., Farrokhnia et al., 2023; Mai et al., 2024), and its influence on students' skill acquisition (e.g., Asad & Ajaz, 2024; Sardi et al., 2025). Although these studies shed light on many aspects of ChatGPT's use and its effect on learning outcomes, there is a need for comprehensive reviews for educators who want to thoughtfully integrate ChatGPT in classrooms. Alvarado-Bravo et al. (2024) recently conducted a bibliometric study to examine AI as a potential tool for SS development. However, they did not clearly indicate the impact of AI on students' SS or the models tested for AI integration.

To address this gap, this review adopted a bibliometric-content analysis approach, aiming to shift the focus from 'what' ChatGPT does to 'how' educators can intentionally implement pedagogical strategies with ChatGPT to develop SS in students. By analyzing 136 English-language journal articles and proceeding papers from 2022 to 2025, the researcher sought to synthesize the following:

- 1) Impacts of using ChatGPT on students' SS in educational settings;
- 2) Suggestions for ChatGPT integration to foster SS development.

Literature Review

Definition of Soft Skills

The role of SS in an individual's development has been acknowledged extensively. From the years spent in school to adulthood, their influence spans across all phases of human life and helps people overcome crises (Feraco et al., 2024; Martínez et al., 2021). However, in what ways are SS defined?

In 1998, Goleman suggested that SS is closely related to emotional intelligence, classifying it into self-awareness, self-regulation, motivation, empathy, and other social skills (Goleman, 2006). Many researchers, educational practitioners, and politicians in the 1990s described SS as a set of non-academic abilities and recognized its contribution to students' academic success (Chamorro-Premuzic et al., 2010).

Stepping into the 2000s, the concept of SS moved beyond interpersonal communication to encompass a skill set that helped individuals gain a profound understanding of themselves. In 2019, UNICEF acknowledged SS, interchangeably called transferable skills, as having the ability to act as a bridge and support system for foundational, digital, and job-specific skills. Therefore, they are considered essential skills for children and adolescents to succeed in school, life, and work, owing to their characteristic of being 'central magic glue' (UNICEF, p. 1, 2019).

As the 21st century reaches its 25th year, SS is commonly described as a broad set of non-technical and personal attributes that help individuals organize their lives, communicate with others, and adapt successfully to uncertainty.

Approaches to Soft Skills Education

In institutional settings, SS is cultivated both formally and informally. Students can learn and strengthen their SS by enrolling in compulsory courses (formal) and non-credit extracurricular activities (informal). One approach supported by many educators and scholars is to integrate SS into existing curricula rather than treating them as separate subjects. In this approach, teachers are encouraged to blend SS into class activities and assignments, even while delivering specialized knowledge and technical training (Otermans et al., 2023; Widad & Abdellah, 2022).

To date, SS training regularly involves a range of interactive, student-centered instructional methods that reflect real-world experiences. In other words, it should be oriented and customized to students' needs.

Digital Transformation in Teaching Soft Skills

As discussed, introducing SS into the curriculum does not equate to adding new topics or activities. This can be conveyed through what has already been done. Teaching SS by doing has been shown to work in many fields (e.g., Molek-Winiarska & Kawka, 2022; Vázquez-Calatayud et al., 2024), and with the assistance of advanced digital tools, it can be executed in innovative ways. For instance, digital games and simulations (Garcia et al., 2020), online educational platforms and flipped learning (Medvedeva et al., 2022; Moundy et al., 2022), and microlearning using mobile devices or social networks (Romanenko et al., 2023).

ChatGPT has been offering various innovative possibilities for teaching and learning experiences thanks to its ability to answer queries, generate learning material at different difficulty levels, and provide feedback (Memarian & Doleck, 2023). In a study by Wang (2025), students from non-English-speaking countries using ChatGPT-4 reported improved proficiency and gained greater confidence in their English communication. Recognizing the value added by ChatGPT, many scholars have started experimenting with this tool for training in other areas. In communication courses, ChatGPT has been reported to assist students in answering theory-based questions, generating ideas, and practicing application-based communication tasks (AlAfnan et al., 2023). Furthermore, teachers can use ChatGPT responses as examples for classroom discussions, encouraging students to think critically about their communication skills and improve them (AlAfnan et al., 2023). In healthcare training, ChatGPT helps trainees practice patient communication skills tailored to their expertise (Bonfitto et al., 2024).

Nevertheless, students are advised to be aware of AI's limitations when it comes to its unethical use and potential harm to their critical and analytical thinking (Ogunleye et al., 2024). Relying too much on AI tools in general, and ChatGPT in particular, could threaten cognitive development (Dron, 2023). Another factor that could hinder the advantage of ChatGPT in education is the digital divide caused by limited infrastructure and other socioeconomic constraints, which would deepen the gaps between individuals from different regions (Hussein et al., 2025).

The emergence of ChatGPT in academic settings, though has promoted digital transformation in education towards personalized learning environments, requires careful consideration of ethical issues and how to integrate the tool effectively.

Methodology

The present study used a dual approach combining bibliometric and content analyses to examine previous research on the use of ChatGPT and its influence on students' SS. While bibliometric analysis provides empirical grounds for the topic under research, content analysis helps gain comprehensive insights into the publications (Maral, 2025).

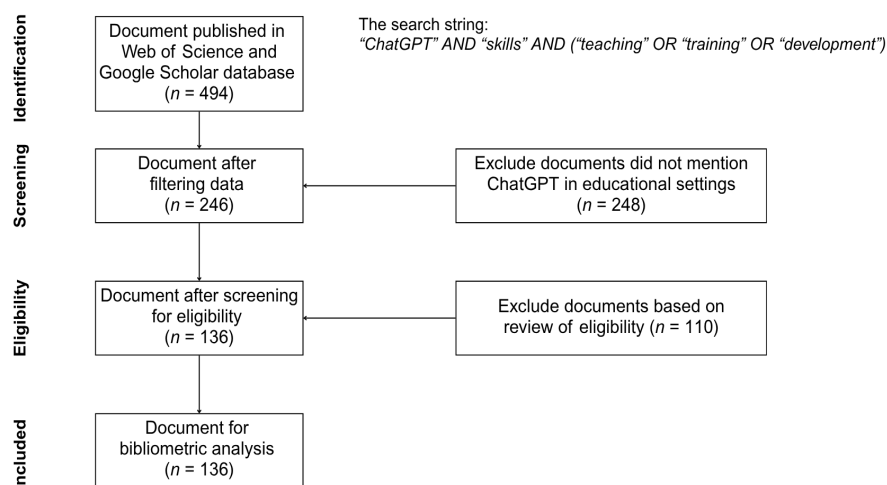
Data Collection

Search Criteria

A literature search was conducted using the Web of Science (WoS) and Google Scholar databases. The researcher used relevant keywords and their combinations and Boolean operators "ChatGPT" AND "skills" AND ("teaching" OR "training" OR "development") to search within the titles, abstracts, and keywords of publications. The selection criteria included English language, peer review (articles, conference proceedings, review papers), and publication dates from January 1, 2022, to April 30, 2025.

Article Screening

The researcher followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to search for documents, as shown in Figure 1. The initial search yielded 494 documents, of which 248 were excluded because they did not refer to ChatGPT in the educational context.

Figure 1*Flowchart of Document Selection Using PRISMA Guidelines*

Subsequently, the titles and abstracts of the remaining 215 documents were read to determine their relevance to SS. At this stage, the researcher used the following research questions as guidance for selection:

- *Research Question 1 (RQ1):* What were the most discussed impacts of ChatGPT on students' SS development?
- *Research Question 2 (RQ2):* What pedagogical approaches are recommended for educators to leverage the use of ChatGPT in fostering students' SS?

After an additional 110 documents were eliminated, the total document count was 136.

Data Analysis

The metadata of the 136 articles, such as paper title, paper source, author names, affiliations, keywords, and citations, were imported into an Excel file. The Excel file was uploaded to OpenRefine for data cleaning and preparation. Then, the VOS Viewer and Displayr were used to perform descriptive statistical analyses.

To gain further insights, the researcher employed content analysis on empirical studies to extract information such as research subjects, methods, main findings, and research implications. By doing this, the researcher was able to focus on identifying what problems exist and what benefits arise in the context of ChatGPT and the development of students' SS, as well as the recommended approaches for educators that directly address the study's research questions.

Results

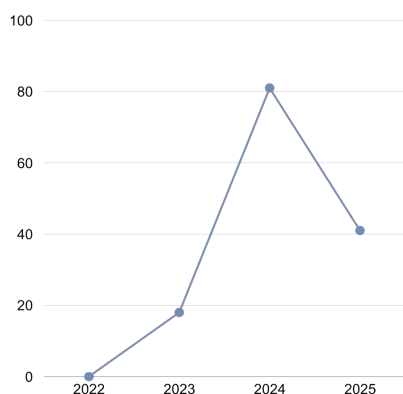
Volume and Growth Trajectory

The number of articles on ChatGPT in relation to SS in the period 2022–2025 is presented in Figure 2. Because ChatGPT was not released until November 2022, no publication was reported in this year.

Starting with 18 publications in 2023, the number of publications was multiplied approximately five times by the end of 2024. This rising trend implies not only interest among scholars regarding the intervention of ChatGPT in educational contexts but also indicates the importance of this field for stakeholders, that is, researchers, educators, and students. In the second quarter of 2025, 41 papers were published, signaling a rapid pace of research in this area moving forward.

Figure 2

Number of Publications per Year From January 2022 to 30 April 2025

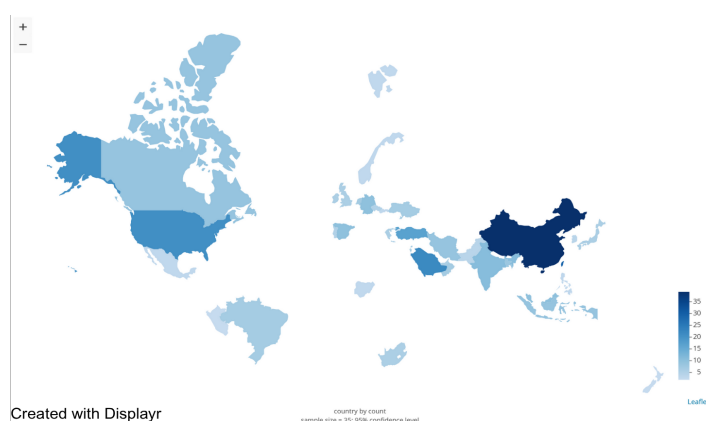


Geographic Distribution

A total of 136 ChatGPT-SS-related documents were published by scholars from 35 countries (Figure 3), including Bangladesh, Brazil, Canada, China, the Czech Republic, Germany, Greece, India, Indonesia, Iran, Ireland, Israel, Japan, Malaysia, Mexico, the Netherlands, New Zealand, Nigeria, Norway, Oman, Pakistan, Peru, the Philippines, Portugal, Saudi Arabia, Slovakia, South Africa, South Korea, Spain, Taiwan, Turkey, Ukraine, the United Arab Emirates, the United Kingdom, and the United States of America (USA).

Figure 3

Choropleth Map Illustrating Geographical Distribution of Studies



Scholars from China were the most productive in this research domain ($n = 38$; 13.72%). Taiwan ranked second ($n = 28$; 10.11%), followed by Saudi Arabia ($n = 21$; 7.58%). These three countries, together with the USA ($n = 20$; 7.22%), Turkey ($n = 16$; 5.78%), and India ($n = 10$; 3.61%), comprise the top six countries in the number of publications.

The fact that ChatGPT was developed by OpenAI, an American technology company, makes the lead of China in this matter surprising. However, if we look at how the Chinese government made AI development plans a national strategic priority in 2017, this was to be expected. As of 2022, China had registered four times as many AI-related patents as the USA and was closing the gap in top-tier research output thanks to the groundwork laid years earlier (Kuo, 2025).

Along with China, the appearance of Saudi Arabia on this list has prompted closer attention. Traditionally known for its high dependency on oil, Saudi Arabia's ambition began pursuing economic diversification in 2019, shifting its major financial allocation towards AI infrastructure development (Global AI Summit, 2024).

Taken together, the involvement of these nations suggests widespread interest in AI, particularly ChatGPT, which surpasses geographical boundaries. Moreover, this interest did not stop as an abstract concept but as one that led to transformation in national strategies.

Most Frequent Keywords

To understand the evolution of literature from 2023 to 2025, keyword analysis was performed using keyword co-occurrence overlay visualization through VOS Viewer (Figure 4). Out of 559 keywords, only 43 keywords were included, since the condition for running the analysis was that the keyword had at least three co-occurrences. The most frequently used keywords included ChatGPT (125 co-occurrences), artificial intelligence (46), higher education (21), generative artificial intelligence (20), education (18), and critical thinking (13).

Figure 4 shows several interconnected clusters indicating the research themes. At the center of the network, "ChatGPT" acted as a focal point of research in the analyzed papers. From there, the rest were grouped into five major thematic clusters.

Cluster 1: ChatGPT and Technical Aspects

In the first cluster, ChatGPT was studied in a broader term: a generative AI-based technology. This cluster consists of nine keywords focusing on ChatGPT application in computational practice, for example, "prompt engineering," and its recognition as an AI conversational agent.

Cluster 2: ChatGPT and Language Learning

This cluster pinpoints the use of ChatGPT by English as a Foreign Language (EFL) learners and teachers. The keyword "chatbot" in this cluster further emphasized ChatGPT's capability to produce human-like dialogues, serving as a helpful aid for practicing language skills (Alshammari, 2024).

Cluster 3: ChatGPT and Skills

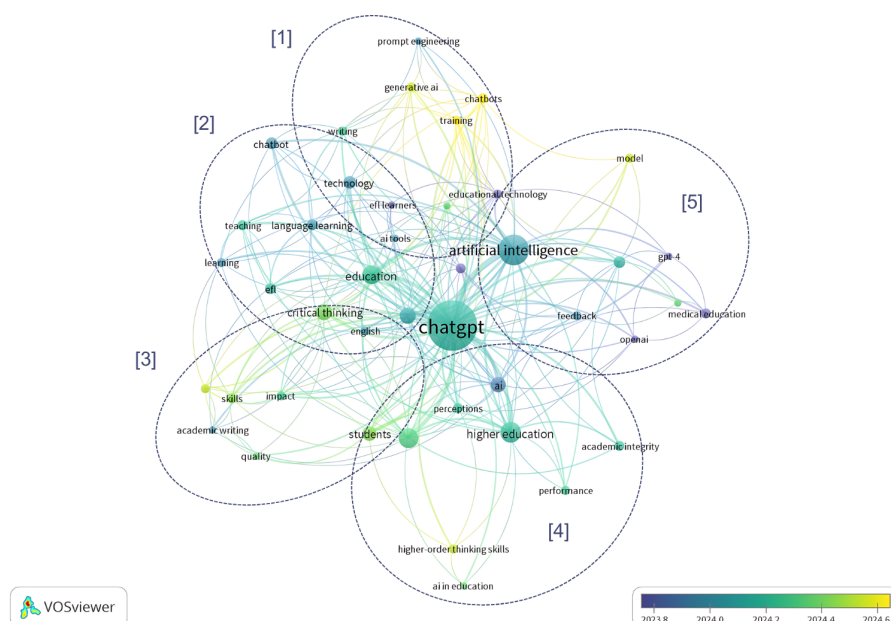
Built around keywords such as "critical thinking," "quality," "skills," and "impact," the third cluster delves into the benefits and challenges towards skill development posed by the emergence of ChatGPT. The inclusion of "academic writing" implies a focus on how ChatGPT influences skills in formal contexts, particularly writing skills.

Cluster 4: ChatGPT and Higher Education (HE)

This cluster specifically targets the implications of ChatGPT in HE. Scholars' attention has been drawn to its impact on students' higher-order thinking skills (HOTS). Alongside its potential, academic integrity, such as plagiarism and ethical usage, is a key concern for stakeholders (Aghaee et al., 2024).

Figure 4

Network Analysis of Keywords With at Least Three Co-occurrences in Papers Published 2023–2025



Cluster 5: ChatGPT and Medical Education

The last cluster attends to the contribution of ChatGPT to the niche area of health care education. The appearance of GPT-4 in this cluster indicates the focus of research on the application of ChatGPT's advanced models to enhance learning outcomes. Among these, ChatGPT-generated feedback, although not fully replacing experts' input, might be a potential alternative during medical practitioners' training, especially in improving clinical reasoning skills (Çiçek et al., 2024).

Content Analysis

Of the 136 papers, 34 were review and conceptual papers, and 102 were empirical studies. The researcher focused only on empirical content analysis. These papers were read and labeled based on their research subjects and methods. The details of this are described in the following sections.

Research Subjects

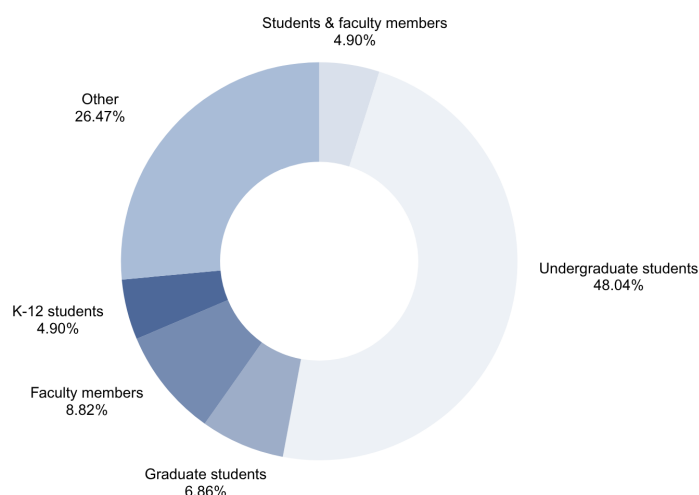
The majority of 102 empirical studies targeted current students and faculty in institutions. Figure 5 presents the proportion of each research subject group. Within the sample, only five publications studied K-12 students (4.90%), whereas 56 studied HE students (54.90%). This

skewed attention in research was highlighted by Yusuf et al. (2024) in their review paper, noting that studies in ChatGPT-SS seemed to focus more on college students.

A significant number of research subjects in these empirical studies were categorized as “Other” ($n = 27$; 26.47%). Within this segment, pre-service teachers were the most frequently studied group ($n = 11$), followed by EFL learners ($n = 6$) at universities.

Figure 5

Research Subjects of Empirical Studies

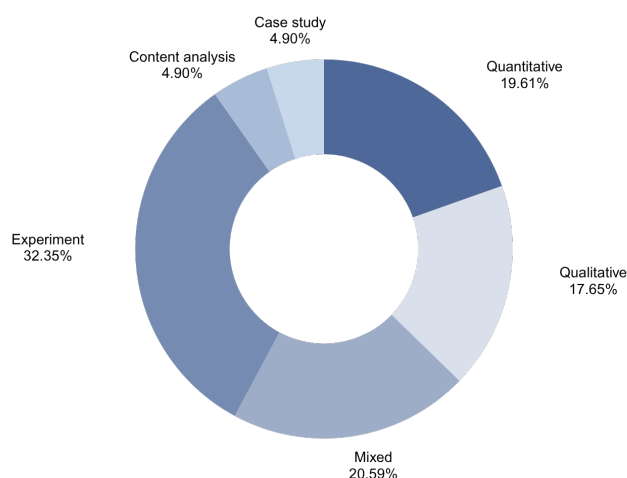


Methods

Various methods were used in the empirical studies examined (Figure 6). Most empirical studies have been conducted using traditional quantitative and qualitative methodologies, such as surveys and interviews ($n = 38$; 37.25%). The second most widely used was experiments, with 33 papers (32.35%), followed by mixed methods, with 21 papers (20.59%). Additionally, a few papers employed case studies ($n = 5$; 4.90%) and content analysis from social media and news ($n = 5$; 4.90%) as methodologies.

This variety of research methods highlights the wide range of methodologies used by scholars in this domain. Traditional methods have been used to investigate stakeholders' perceptions and correlational relationships. Meanwhile, adopting experimental approaches and other innovative techniques has assisted scholars in examining the causal effects of ChatGPT on particular SS and testing frameworks.

Figure 6
Research Methods Adopted in Empirical Studies

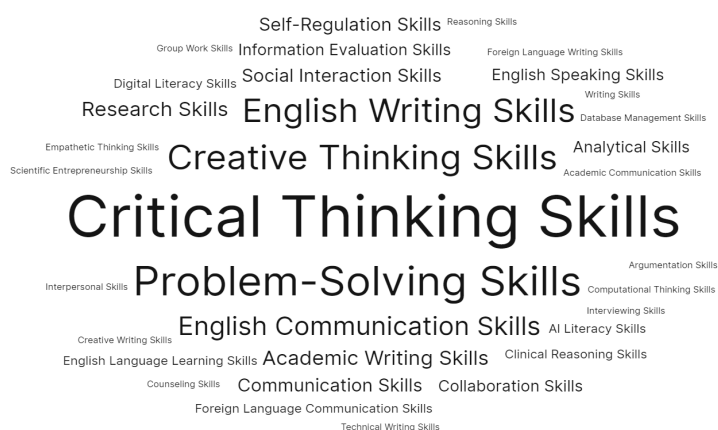


Most Researched Soft Skills

Figure 7 illustrates the word cloud of the dominant SS within papers published between 2023 and 2025. “Critical thinking” (n = 39) is the most frequent keyword in the word cloud, indicating its prominence in research related to ChatGPT and SS in educational contexts. Other HOTS that were under the interest of researchers include “problem-solving” (n = 20) and “creative thinking” (n = 14). This focus on various cognitive skills suggests a significant concern regarding how ChatGPT affects students’ fundamental intellectual competency. In the field of language learning and academic communication, “English writing skills” (n = 13) are highly studied within the context of English as a Foreign Language (EFL) learning, followed by “English communication skills” (n = 8).

Additionally, the visibility of “academic writing skills” (n = 5) in the word cloud reflects the ongoing debate among researchers on the efficacy of ChatGPT in improving students’ writing abilities (Li & Ironsi, 2024). Among interpersonal competencies, many studies have focused on “social interaction skills” (n = 4) alongside “collaboration skills” (n = 3) of HE students, implying their significant perceived importance in the context of ChatGPT's influence or use.

Figure 7
Word Cloud Visualization of Skills From Papers Published 2023–2025



Notably, there is growing interest in competencies that are crucial in the digital world, such as information evaluation skills ($n = 3$), digital literacy skills ($n = 2$), and AI literacy skills ($n = 2$). Collectively, they highlight a recognition among scholars that, in the constantly changing state of AI, simply possessing traditional skills is not enough. Instead, students should also be equipped with updated AI literacy skills to utilize the potential of ChatGPT (Naamati-Schneider & Alt, 2024).

Content Analysis of Key Papers From Research Questions

The papers were grouped based on the identified SS, revealing four distinct themes: HOTS, language learning and communication skills, and interpersonal skills. Within each thematic group, the maximum of the five most-cited papers was selected for a more in-depth analysis (totaling 13 papers). The researcher then extracted data on key findings related to the impact of SS (addressing RQ1) and recommendations for educators and institutions (addressing RQ2). Table 1 presents the results.

Theme 1. ChatGPT and HOTS. This cluster comprises 56 studies investigating ChatGPT in relation to HOTS, with a high concentration on critical thinking, creative thinking, and problem-solving. Five studies were selected for the content analysis.

Theme 2. ChatGPT and Language Learning and Communication Skills. This cluster contains 43 papers discussing the impact of ChatGPT on the language learning process of college students and how it influences their academic communication practice. Among the five studies chosen for content analysis, two were experimental.

Theme 3. ChatGPT and Interpersonal Skills. Cluster 3 includes papers mentioning ChatGPT and its influence on students' interpersonal skills, such as social interaction and collaboration with others. As there were only three studies addressing this topic, the researcher recruited all of them into the content analysis.

Discussion

Final Remarks About the Research Landscape Regarding ChatGPT and Soft Skills

Together with existing literature reviews, this study adds to the body of research on ChatGPT in educational settings (e.g., Grassini, 2023; Yusuf et al., 2024), especially its influence on SS (e.g., Daniel et al., 2025), and further enriches the story.

First, this study reported rapid growth in the research landscape of ChatGPT-SS, attracting researchers worldwide, especially from China, Taiwan, Saudi Arabia, and the US. This indicates that the topic of ChatGPT and its role in the development of SS is indeed a global phenomenon. Second, upon examining the most frequently used keywords in publications, we observed a significant concentration on how ChatGPT can improve and impede SS, specifically academic writing and critical thinking skills. This was followed by ethical concerns regarding potential harm to academic integrity within the HE context.

Regarding research subjects, the majority of empirical studies targeted HE stakeholders rather than those in K-12 settings. This suggests that the prominent focus of ChatGPT's impact and integration strategies was largely centered around university-level learners, even though ChatGPT has been commonly used among teen students (Beshay, 2025) and presented both

opportunities and challenges for their SS development (Zhang & Tur, 2023). This gap calls for more research to examine this phenomenon in earlier educational stages.

In terms of research methodologies, there has been an increase in experimental research, in addition to a significant number of studies that used surveys and interviews to gather information about the perceptions and attitudes of faculty and students towards ChatGPT. This could be considered an effort of scholars transitioning from examining correlation relationships to investigating the causal effects of ChatGPT on specific SS. Considering the widespread usage of ChatGPT in academic environments, more rigorous research designs are crucial to test pedagogical strategies and provide stronger evidence for effective AI integration.

Finally, the analysis of the research on SS revealed that HOTS (i.e., critical thinking, problem-solving, and creative thinking) was the main concern among stakeholders. How ChatGPT influences fundamental language competencies has also been under the research interests of many scholars, underscoring an ongoing discussion of AI adoption in improving students' language use and communication skills. There has been growing recognition among researchers of digital skills as a crucial requirement for the age of AI, implying that traditional SS alone is not enough.

Table 1
Content Analysis of Most-Cited Papers Addressing the Research Questions

Title	Author	Method	RQ1	RQ2
Theme 1: ChatGPT and high-order thinking skills				
Exploring the influence of ChatGPT on student academic success and career readiness	Dahri et al. (2024)	Quantitative	- ChatGPT's high-quality output improves student cognitive skills (info processing, problem-solving). - Stronger cognitive skills lead to more effective and frequent ChatGPT use. - Over-reliance can hinder critical thinking.	- Tailor content using ChatGPT's high-quality, personalized outputs. - Train students to critically evaluate AI content, preventing over-reliance and misinformation.
ChatGPT-enhanced mobile instant messaging in online learning: Effects on student outcomes and perceptions	Huang et al. (2025)	Experiment	ChatMIM significantly improved HOTS by reducing cognitive load and providing instant info/feedback.	- Prioritize integrating AI features that reduce cognitive load. - Integrate AI into familiar platforms for high user acceptance and minimal learning curve. - Balance AI support with fostering independent thought and human interaction.
Exploring decision-making competence in sugar-substitute choices: A cross-disciplinary investigation among chemistry and sports and health students	Dindorf et al. (2024)	Quantitative	- Study highlights ChatGPT risks: bias, misinformation, reduced interaction, and critical thinking harm from over-reliance. - ChatGPT's diverse viewpoints may homogenize student perspectives, reducing original group divergence.	- Encourage interdisciplinary learning to boost problem-solving, critical thinking, and decision-making. - Use deep learning to analyze arguments, revealing patterns and improving decision-making.
ChatGPT challenges blended learning methodologies in engineering education: A case study in mathematics	Sánchez-Ruiz et al. (2023)	Quantitative	- ChatGPT enhanced students' problem-solving comprehension by offering step-by-step solutions, not just answers, for math problems. - Students' over-reliance on ChatGPT for problem-solving and knowledge acquisition could impede critical thinking and independence.	- Rethink assessments to ensure work reflects genuine knowledge, given ChatGPT's impact. - Use ChatGPT as a supplementary tool; monitor its use and promote critical evaluation.
A ChatGPT-AIPSS approach for SDGs: Classroom engagement and collective efficacy of students with different levels of critical thinking	Li et al. (2025)	Experiment	- High critical thinking students benefited more from ChatGPT, using it for exploration leading to richer discussions and group problem-solving. - Low critical thinking students showed no significant benefit, passively accepting AI info rather than engaging deeply.	Design differentiated instruction based on student critical thinking levels: - Offer challenging tasks to students with high critical thinking to advance their skills. - Provide explicit guidance to low critical thinking students for better engagement with LLMs and problem understanding.
Theme 2: ChatGPT and language learning and communication skills				
A study on the efficacy of ChatGPT-4 in enhancing students' English communication skills	Wang (2025)	Experiment	- ChatGPT-4 users showed significant English communication skill improvement over traditional instruction. - ChatGPT-4's personalized, adaptive environment boosted student comfort and confidence, aiding language acquisition.	- Integrate ChatGPT-4 strategically into English curricula, tailoring it to student and school needs. - Policymakers should make informed choices about integrating ChatGPT-4 as an additional tool. - Encourage collaboration between ChatGPT-4 developers and teachers for individualized materials.
Enhancing academic writing skills and motivation: Assessing the efficacy of ChatGPT in AI-assisted language learning for EFL students	Song and Song (2023)	Mixed method	- Students in AI-assisted classes demonstrated higher motivation and better academic writing performance. - Participants worried over-reliance on ChatGPT could hinder creativity and critical thinking.	- EFL learners should actively use AI writing tools for immediate, targeted feedback and improvement. - Educators should establish AI-supported writing classes and train learners on effective AI tool usage.
The impact of integrating ChatGPT with teachers' feedback on EFL writing skills	Asadi et al. (2025)	Mixed method	Students receiving ChatGPT feedback showed statistically significant, large improvements across all writing areas (task achievement, coherence, vocabulary, grammar, and overall score).	- Use ChatGPT for personalized, prompt, and adaptive writing feedback, especially in argumentative essays. - Guide students to critically engage with AI feedback to foster independent thinking. - Institutions must update academic integrity policies for AI and ensure teacher professional development in responsible AI use.
To resist it or to embrace it? Examining ChatGPT's potential to support teacher feedback in EFL writing	Guo and Wang (2023)	Experiment	- ChatGPT focused equally on all writing areas; teachers prioritized language and content over organization. - ChatGPT's feedback was significantly more voluminous and faster, but 18% was misaligned or off-task. - ChatGPT could not directly annotate essays and lacked contextual awareness (student background, course goals).	- Leverage ChatGPT for high-volume writing feedback, reducing teacher workload and allowing focus on nuanced guidance. - Teachers should review, modify, and integrate ChatGPT's feedback with their own context-specific insights before sharing with students.
Using generative artificial intelligence/ChatGPT for academic communication: students' perspectives	Liu et al. (2024)	Mixed method	- ChatGPT saved time, identified improvement areas, and helped students learn academic communication skills. - ChatGPT was beneficial for vocabulary, grammar, and reading comprehension, but students doubted its potential for speaking/listening. - ChatGPT was more helpful for writing assignments than general communication.	- Incorporate LLM chatbots into teaching and self-regulated learning (e.g., for writing feedback, vocabulary). - Redesign assessments and course objectives to reflect AI tool integration. - Institutions must develop clear policies and provide training on ethical AI use, including assessment guidelines.

Title	Author	Method	RQ1	RQ2
Theme 3: ChatGPT and interpersonal skills				
Integration of AI into the distance learning environment: Enhancing soft skills	Borkovska et al. (2024)	Mixed method	- ChatGPT was effective for developing SS like communication, teamwork, empathy, and collaboration in distance learning. - ChatGPT couldn't mimic in-person interactions or emotional bonds, limiting its ability to fully replicate crucial human interaction for SS.	Employ strategies to enhance learning and improve students' critical thinking, communication, teamwork, and creativity. For example: (1) Students write a description, then compare it with ChatGPT's; (2) Highlight and compare student-used phrases/constructions with ChatGPT's; (3) Use chat features to introduce new descriptive constructions.
Generative AI in higher education: Educators' perspectives on academic learning and integrity	Aghaee et al. (2024)	Qualitative	- ChatGPT use might influence student interaction, potentially affecting soft and cognitive skill development like collaboration and group learning. - Some respondents worried about ChatGPT's impact on SS, while others believed it depended on individual motivation, digital skills, and tool usage.	- Develop clear digital technology guidelines, provide educator/student workshops, prioritize critical thinking, and promote ethical AI use. - Educate students on AI tool benefits and risks instead of banning them.
Exploring the impact of ChatGPT on improving 21st-century skills for future English teachers during lesson planning	Yildiz (2024)	Case study	- ChatGPT aided pre-service teachers (PST) in structuring ideas for peer sharing, supporting collaboration skills, and making brainstorming more efficient. - ChatGPT helped PST adapt their communication style with different ages of students, which was beneficial for lesson planning.	- Integrate ChatGPT into teacher training to bridge teaching methods and enhance pedagogical/technological fluency. - Systematically develop 21st-century skills (4Cs) across lesson planning, implementation, and assessment.

Suggestions for Educator Practice

Prepare Students for Effective Usage of ChatGPT

One of the main concerns of both teachers and students when using ChatGPT is that they, the students, will become overly reliant on this AI tool, which could hurt their development in SS (Aghaee et al., 2024; Klimova & De Campos, 2024) and expose them to misinformation risks (Dahri et al., 2024; Mohamed, 2023). In response, numerous researchers have emphasized the need for educators to enhance students' digital competencies (e.g., Alshammari, 2024; Kurt & Kurt, 2024) and provide them with knowledge about AI literacy (e.g., Dindorf et al., 2024; Naamati-Schneider & Alt, 2024) before introducing ChatGPT into the classroom. Asadi et al. (2025) suggested that educators should assist students in evaluating ChatGPT's feedback and encourage them to critically challenge the content created by ChatGPT. Meanwhile, Li et al. (2025) and Naamati-Schneider and Alt (2024) urged training students to effectively interact with LLMs like ChatGPT through prompting skills. This means not only understanding its language, strengths, weaknesses, and biases but also learning how to customize queries to obtain the desired responses. For this reason, a comprehensive digital competency curriculum that addresses the necessary AI knowledge and technical and communication skills is essential. From there, educators can customize digital skills aligned with the learning objectives of each subject and tailor their guidelines to support students in evaluating ChatGPT-generated content.

Leverage ChatGPT's Strengths for Soft Skill Development

Many students across empirical studies (e.g., Dahri et al., 2024; Song & Song, 2023; Wang, 2025) have stressed that ChatGPT tailors its feedback and offers personalized support to their needs, thus contributing to their SS development. Students' SS development can also benefit from ChatGPT's potential to act as a support system for self-regulated learning. However, for students to maximize these benefits and avoid over-reliance, it is important to promote their proactivity as autonomous learners and strategically integrate the tool into academic activities while adopting a critical approach to its use.

For example, according to Li et al. (2025), educators should take into account the diversity in their students' thinking skills when developing teaching materials. To further foster HOTS in students with profound SS, educators can gradually increase the difficulty of their assignments. With students who are at the early stage of critical thinking skills, Li et al. (2025) suggested providing more explicit guidance (such as breaking down problems), encouraging students to ask questions, and instructing them on how to communicate effectively with ChatGPT. In their study, Cahill and McCabe (2024) mentioned that using ChatGPT as a tutor in classrooms can enhance student learning. By interacting with ChatGPT, students can understand why their answer to a quiz is incorrect or learn the reasoning behind a mathematical solution (Cahill & McCabe, 2024). Resonating with this idea, Liu et al. (2024) recommended employing ChatGPT as a guiding tool for brainstorming ideas and helping students uncover areas for improvement. As ChatGPT tends to provide responses that contain ideas from various fields, Dindoff et al. (2024) encouraged educators to take advantage of this feature to adopt interdisciplinary learning, which is beneficial for students' problem-solving, critical thinking, and decision-making competencies.

A core principle of ChatGPT integration in SS development is to adopt it purposefully and in a timely manner. Huang et al. (2025) advised incorporating AI features into structured post-class discussions, especially in information-dense learning environments, where cognitive overload is a common challenge. Specifically, their experiment with ChatMIM revealed that not only can ChatGPT allow students to quickly obtain information without interrupting their learning flow, but it also improves the quality of student collaboration. Guo and Wang (2023) emphasized utilizing both personal touch and ChatGPT-driven personalization during writing courses for its ability to rapidly provide a large quantity of feedback. With ChatGPT, educators can focus on more complex issues, tailor feedback based on student and class contexts, and provide more informative and individual-based guidance to their students. Borkovska et al. (2024) proposed employing strategies like having students write a brief answer on paper before using ChatGPT and then comparing them with the tool's to identify weaknesses. This comparison process is helpful in improving both writing and language skills. It also draws students into a thorough evaluation process involving critical thinking.

Build a ChatGPT-Ready Educational Environment

As ChatGPT has become widely used among students, it calls for well-defined policies and guidelines to ensure effective and responsible AI integration in educational settings. First, clear policies and guidelines are required to ensure the ethical use of AI in education (Alshammari, 2024; Liu et al., 2024). These guidelines must consider concerns, such as data privacy, academic integrity, and fair access, to establish standards for the appropriate use of ChatGPT and similar AI tools. Many sources have stated that regulations should also adapt to diverse contexts, for instance, different institutional priorities and different stakeholders (e.g., postgraduates and undergraduates) (Liu et al., 2024; Zhang & Tian, 2025). Furthermore, educators and institutions should look upon inclusivity and cater to the guidelines for students from all backgrounds, particularly those from disadvantaged communities, to reduce educational inequalities (Zhang & Tian, 2025).

Second, it is crucial to revise the teaching materials, course objectives, and learning outcomes to reflect this emergence. Besides monitoring student work to ensure that they genuinely acquire knowledge (Sánchez-Ruiz et al., 2023), educators should consider redesigning assessments and exploring alternative options that incorporate the use of ChatGPT and AI tools (Liu et al., 2024). As ChatGPT has strikingly transformed the educational landscape, reviewing

curricula and instruction methodologies plays a critical role in navigating ChatGPT-assisted learning and equipping students with guidance for autonomous knowledge acquisition.

Finally, along with educating students about the benefits and risks of these tools towards their SS development, teacher training is equally important (Yıldız, 2024). Equipping faculty members with the requisite digital skills to effectively embrace technological advancements during their mentorship of students is a critical step (Asadi et al., 2025). Eventually, the role of educators is to help students navigate their learning process autonomously, maximize AI's potential, and ensure its responsible and ethical use.

Conclusion

Although the methodology employed in this study was helpful in achieving its research objectives, it had certain limitations. First, as the study only included peer-reviewed papers and conference proceedings written in English, it may have missed influential works that were published in other languages. Therefore, to better understand the impact of ChatGPT on students' SS from different cultural backgrounds, especially when this LLM-based chatbot may perform variably across various language practices (Ando et al., 2024; Fang et al., 2023)—a future literature review covering a wider range of languages would be helpful. Second, since the content analysis relied on a purposeful sample of papers based on their citation count, instead of all 102 initial papers, it risks leaving out influential younger publications that often have less exposure than older ones (Teplitskiy et al., 2022).

Despite these limitations, this study describes the overall research landscape. The results of the literature review show that even though there is debate among scholars and experts about the benefits of ChatGPT in the SS acquisition process, threats exist. Therefore, all stakeholders should be actively involved in the emergence of AI tool usage in the classroom. Key recommendations from the literature include updating regulations to maintain academic integrity and ensure digital equity, tailoring AI integration strategies instead of absolute prohibitions, and providing clear AI guidance and digital literacy training for both educators and students.

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