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Artificial intelligence and the development of soft skills for employability: A student-centered investigation

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Abstract

The growing implementation of AI in educational settings has significantly influenced the competencies that students need to be employed within the 21st century. While AI is helping with the development of technical skills and analytical competencies, soft skills, including communication, adaptability, collaboration and critical thinking are still required for lifelong career success. This paper examines the attitudes of university students towards the role of AI in fostering soft skills as pertaining to employability. A structured questionnaire was administered to Moroccan university students in business management and law programs to explore their awareness, use, and attitudes toward AI-supported learning tools. Results indicate that students recognize that AI can support the development of cognitive and personal soft skills, but express doubt concerning its effectiveness in fostering interpersonal and emotional capabilities. The findings also emphasize the necessity for a pedagogically supported integration of AI which is guided by human interaction and ethical reflection. AI may complement but not substitute human teaching when it comes to employability-centered soft skills development, according to the study.

Keywords: artificial intelligence, soft skills, employability, higher education, student perceptions

1. Introduction

The job market and work environment are experiencing transformative changes due to rapid developments of Artificial Intelligence (AI) and digital technologies. The move to automation

and smart systems is changing professional roles and redefining the skills required to do well in the knowledge economy. AI is considered one of the most disruptive technological forces of our time, with even wider ranging effects than just efficiency and productivity, effects informed by human creativity, collaboration, and communication (World Economic Forum 2023). In this context, soft skills, the interpersonal, cognitive, and emotional competencies that allow individuals to adapt and interact effectively, have emerged as key determinants of employability. Employers are increasingly indicating graduates do not possess the appropriate soft skills to effectively function in multidiscipline and technology-enhanced settings. Though higher education institutions have started to bring in digital and AI tools into instruction, they are often focusing on cognitive or technical competence. Therefore, there is increasing skepticism as to whether AI enhanced-learning environments have the potential to truly cultivate human-centered competences on which employability is contingent (OECD, 2022).

Notwithstanding the ongoing growing academic focus, students' views, the main user of AI-based learning tools, remain underexamined. Examining how students understand the relationship between AI, soft skills and employment is crucial to designing effective educational interventions and policy. The present study aims to address this gap by investigating university students' awareness, attitudes, and experiences regarding AI's contribution to soft skill development.

The current study aims (1) to examine students' awareness and use of AI tools in their learning; (2) to explore their perceptions of AI's capacity to foster employability related soft skills; and (3) to assess their overall attitudes toward integrating AI in higher education. These objectives are driven by the following research questions:

1) What is the level of students' awareness and use of AI tools in their studies?
2) How do students perceive the role of AI in fostering their soft skills?
3) What are students' attitudes toward using AI to improve their chances for employability?

2. Literature Review

Artificial Intelligence (AI) is rapidly transforming the educational and professional landscapes, fundamentally reshaping the competencies required for success in the labor market. As the Fourth Industrial Revolution advances, employers no longer prioritize solely technical expertise but increasingly demand soft skills, communication, teamwork, creativity, adaptability, and

emotional intelligence, that complement the automation of routine tasks. Higher education institutions, therefore, face the challenge of integrating AI technologies in ways that promote these human-centered capabilities rather than diminish them. This literature review synthesizes key theoretical and empirical works on the intersections of AI, soft skills, and employability, emphasizing pedagogical implications and the gaps that motivate the present research.

AI has reached almost every educational level, from data-driven evaluation platforms to intelligent teaching systems. AI in higher education mainly serves to individualize learning using adaptive algorithms that can identify and evaluate students' strengths and limitations, claim Zawacki-Richter et al. (2019). Students may study at their own pace and in their own way thanks to this individualization, which also fosters self-regulation, metacognitive reflection, and autonomy, all of those qualities are strongly associated with employability. Similarly, Holmes et al. (2019) note that AI-based learning environments offer mentorship-like feedback loops that let students continuously revise, reflect, and improve. These interactive systems reflect learning in the workplace, where flexibility and ongoing skill development are essential.

However, the influence of AI on the development of soft skills is not straightforward. While AI can facilitate cognitive growth and digital literacy, emotional, ethical, and interpersonal skills are less easily cultivated through automation. Chan et al. (2023) argue that although AI enhances task efficiency and self-directed learning, it risks weakening empathy, collaboration, and ethical judgment when overused. This tension underscores the twofold nature of AI: it can either empower or displace essential human capacities, depending on how it is pedagogically used.

As technology has changed, so too has the idea of employment. Employability, which was formerly limited to finding a job, today encompasses a wide range of social and personal skills that enable people to deal with change and uncertainty (OECD, 2022). According to the World Economic Forum (2023), the most important competencies that employers require in the future are analytical thinking, curiosity, resilience, and empathy, skills that are naturally resistant to automation. These insights suggest that rather than focusing solely on preparing students for immediate jobs, higher education should also foster creativity, lifelong learning, and ethical reasoning.

There is an increasing body of literature that investigates how AI can promote these competences. AI-enhanced learning environments support active engagement and learner autonomy, which respectively trigger intrinsic motivation and reflective thinking, contend Al-Samarraie et al.

(2020). Perifanou and Economides (2025) found that students who used AI-supported project-based learning environments were more assured in professional communication and better at leadership and teamwork. Similarly, students can develop their language proficiency and produce more coherent written communication, an important employability skill, using conversational agents and writing tools like ChatGPT or Grammarly. However, if students use these technologies passively rather than reflectively, as cautioned by some researchers, they are more likely to result in dependency and surface learning (Zhai et al., 2024).

Growing agreement in the literature is that pedagogical use of AI should be marked by human–AI complementarity, and not by substitution. This is called the augmentation paradigm by Brynjolfsson and McAfee (2014), in which technology supplements human capability but not at the expense of human agency. Employability here is defined as the capacity to work responsibly and creatively with AI tools. To support the important evaluation of AI outputs by learners, questioning algorithmic power, and the creation of ethical awareness, teachers play a central role as brokers. Holmes et al. (2019) argue that teachers need to move from being providers of knowledge to mentors and facilitators who help learners think critically about AI-offered insights and relate them to professional practice scenarios.

At the same time, ethical concerns are increasingly central to the discussion. Scholars such as Holmes et al. (2022) warn that AI may reinforce societal biases if data and algorithms are uncritically adopted. Issues of transparency, accountability, and data privacy complicate the use of AI in learning analytics and assessment. The need for AI literacy, the competence to understand, evaluate, and ethically interact with AI systems, is now recognized as a component of employability itself. Without these critical literacies, students risk becoming passive consumers of AI outputs rather than active co-creators of knowledge.

Contextual and cultural factors further shape how AI supports employability. Research from developing regions shows that limited infrastructure, digital divides, and linguistic barriers hinder effective AI integration (Chan et al., 2023). In the Moroccan and broader MENA context, AI remains a largely emerging practice in higher education, often restricted to pilot initiatives. Yet the potential benefits are significant: AI could democratize access to quality education, support multilingual learning, and help align university training with market needs. By enabling data-driven feedback and personalized learning at scale, AI can help overcome systemic challenges such as large class sizes and teacher shortages.

Equally important are the psychological and motivational effects of AI on students. Studies reveal ambivalence: while AI enhances motivation and engagement through instant feedback and interactivity, it may simultaneously reduce social interaction and empathy. Holmes et al. (2019) found that students appreciate AI's objectivity but still value human feedback for emotional support and contextual understanding. This indicates that AI should complement, not replace, the interpersonal dimension of education. The cultivation of soft skills, particularly communication, collaboration, and ethical sensitivity, still depends on meaningful human relationships.

In response to these complexities, researchers advocate for human-centered AI pedagogy, which positions technology as a co-educator serving human development goals. Such a model encourages critical reflection, dialogue, and ethical decision-making alongside technical proficiency. It aligns with contemporary theories of transformative learning, which emphasize the integration of cognitive, affective, and behavioral domains. Within this paradigm, AI tools can be leveraged to simulate workplace scenarios, assess interpersonal performance, and provide adaptive challenges that stimulate creativity and resilience. The aim is not to automate learning but to amplify human potential through well-designed interaction with intelligent systems.

Empirical studies, however, remain scarce and fragmented. Most research examines attitudes toward AI or perceived usefulness rather than measurable skill development. Zawacki-Richter et al. (2019**)** note that the evidence base is still in its infancy, especially regarding the impact of AI on non-technical competencies. Moreover, cross-cultural studies are rare, and few address the perspectives of students in developing countries. This gap calls for exploratory, context-sensitive investigations into how learners perceive the role of AI in fostering soft skills relevant to employability.

In conclusion, the literature highlights a paradoxical relationship between AI and soft skills: while AI offers opportunities for personalization, creativity, and feedback, it simultaneously poses challenges to empathy, collaboration, and ethical engagement. The future of employability education depends on how effectively institutions balance these dynamics. Universities must design curricula where AI serves as a partner in learning, empowering students to think critically, act ethically, and communicate effectively in technologically mediated workplaces. The present study addresses this need by examining how university students perceive AI as a catalyst for soft skill development and employability enhancement within the Moroccan higher education context.

3. Materials and Methods

3.1. Research Design

A quantitative descriptive research design was used to collect data from university students through a structured questionnaire. The instrument aimed to measure awareness, use, and perceptions of AI's role in developing soft skills related to employability.

3.2. Participants

The sample consisted of 120 university students enrolled in business and law programs at the Poly-disciplinary faculty of Taza. Participants were selected using convenience sampling to ensure accessibility and diversity of responses. All participants voluntarily agreed to take part in the study.

3.3. Research Instrument: Students' Questionnaire

The questionnaire contained 20 closed-ended items on a 5-point Likert scale (from Strongly Disagree = 1 to Strongly Agree = 5), organized into three main sections, and 3 open-ended questions (Table 1). The questionnaire was distributed in class to ensure clarity and avoid ambiguity. A pilot test was conducted with 10 students to ensure clarity and reliability.

Table 1. *The questionnaire's sections*

Section	Focus	Example Items
A. Awareness and Use of AI	Measures familiarity with AI tools and applications	"I regularly use AI-based platforms (e.g., ChatGPT, Grammarly) to support my studies."
B. AI and Soft Skill Development	Explores perceived contribution of AI to soft skills	"AI helps me improve my communication and writing skills."
C. Attitudes Toward AI and Employability	Examine beliefs about AI's role in job readiness	"AI enhances my employability by improving my problem-solving and adaptability."

Descriptive statistics, mean scores and percentages, are used to summarize responses. Open-ended comments were qualitatively analyzed to identify emerging themes.

4. Results and Discussion

A total of 120 undergraduate students participated in this study: 60 majoring in Business Management and 60 in Law. Data were analyzed quantitatively using descriptive statistics (frequencies, percentages, means, and standard deviations). The mean (M) represents the average level of agreement (1 = strongly disagree to 5 = strongly agree), while the standard deviation (SD) indicates response variation. Qualitative responses are analyzed thematically.

4.1. Section A: Demographic Information

The demographic characteristics of the participants, including gender, age, and field of study, are summarized in Table 2.

Table 2. *demographic information of the participants*

Variable	Categories	Frequency (n)	Percentage (%)
Gender	Male	48	40.0%
	Female	72	60.0%
Age	Under 20	20	16.7%
	20-24	80	66.6%
	25-29	20	16.7%
Field of Study	Business Management	60	50.0%
	Law	60	50.0%
Used AI-based tools before	Yes	90	75.0%
	No	30	25.0%

Most respondents were female (60%) and aged 20–24 which is a typical range of undergraduate students. Half of the participants came from Law and the other half from Business Management, ensuring disciplinary balance. A significant majority (75%) had already used AI tools such as ChatGPT, Grammarly, or Duolingo, reflecting a high level of exposure to AI-assisted learning.

4.2. Students' Perceptions of Artificial Intelligence in Learning

The findings reveal that students demonstrated an overall positive attitude toward AI, with a mean score of 4.21 (SD = 0.68), indicating strong agreement that AI is an essential tool in modern education. Most students agreed that AI platforms make learning more interactive and personalized. This finding aligns with recent studies (e.g., Moya et al., 2024) suggesting that adaptive AI platforms enhance learner motivation and performance. Law students appreciated AI's role in developing analytical thinking and legal reasoning through simulated case analyses, whereas business management students emphasized AI's contribution to decision-making and strategic problem-solving.

Figure 1 shows that the majority of participants (over 70%) either agreed or strongly agreed that AI tools are useful for improving their learning efficiency and confidence.

Only a small proportion (10%) expressed disagreement or uncertainty, reflecting a generally favorable perception across disciplines.

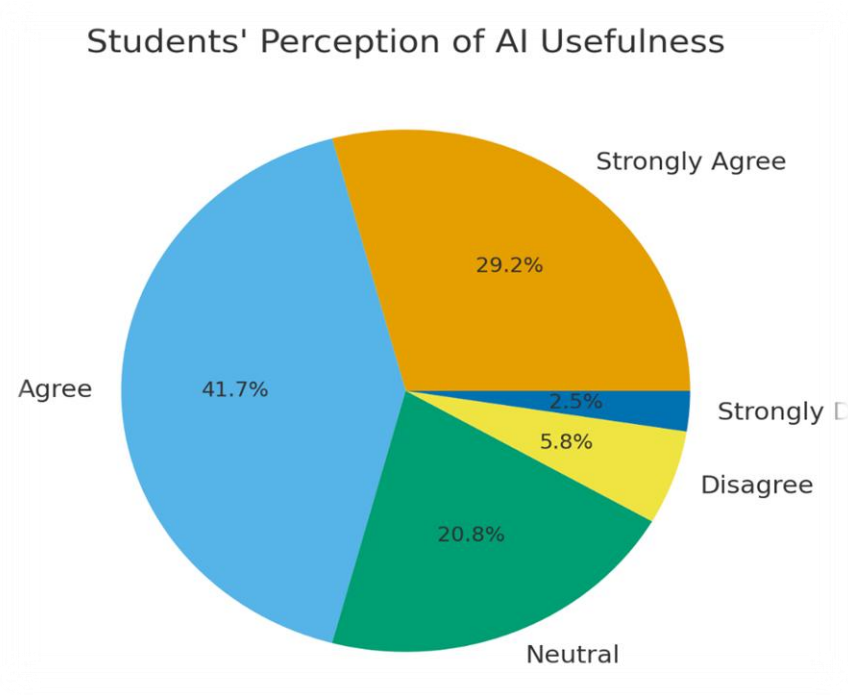

Figure 1. *Students' perceptions of AI usefulness*

4.3. The Role of AI in Developing Soft Skills

The second section assesses how students perceive AI's contribution to developing key soft skills such as communication, teamwork, creativity, and critical thinking. As detailed in Table 3, the results indicate that students perceive AI as effective for problem-solving but less for teamwork.

Table 3. *Students' Perceptions of the role of AI in fostering soft skills*

Statement	Mean	SD
AI improves communication skills.	3.8	0.7
AI promotes teamwork through collaboration.	3.5	0.8
I have developed problem-solving skills using AI.	4.1	0.6
AI enhances creativity.	4.2	0.5
I have become more adaptable due to AI tools.	4.0	0.7

According to table 3, the mean score of 4.05 (SD = 0.70) indicates that students recognize AI as an effective support tool, though not a substitute for human interaction. AI-powered

applications such as chatbots, virtual debate platforms, and writing assistants were reported to enhance communication and collaboration skills. However, both law and business students noted that AI remains less effective in fostering emotional intelligence, a skill often developed through real-world interpersonal contexts rather than technological simulation. These findings are consistent with the work of González-Rico and Lluch Sintes (2024), who found that while AI improves technical and cognitive aspects of soft skills, it falls short in replicating the empathy and adaptability required in professional settings.

4.4. AI and Employability Prospects

Table 4 presents the participants' attitudes toward AI's role in employability. The data reveals a high mean score (M=4.5) for digital literacy acquisition.

Students' views on AI's role in employability were also strongly positive, with a mean score of 4.09 (SD = 0.67). Participants emphasized that familiarity with AI technologies enhances their adaptability, digital literacy, and problem-solving abilities, which are increasingly demanded in the job market.

Table 4. *Participants' views on the role of AI in employability*

Statement	Mean	SD
AI helps me acquire digital literacy.	4.5	0.4
AI enhances my critical thinking.	4.1	0.6
Employers value graduates familiar with AI tools.	4.4	0.5
AI prepares me for future jobs.	4.2	0.5
AI can increase my chances of employability.	4.3	0.5

Law students noted that AI tools support legal research efficiency and familiarity with predictive analytics, while business students highlighted the growing need to analyze big data, automate reports, and communicate findings clearly, skills that directly boost employability. These findings confirm prior research by Tee et al. (2024), who reported that digital and AI-related competencies, combined with soft skills, significantly predict employability outcomes

4.5. Challenges and Limitations in Using AI

Despite the positive outlook, students expressed moderate concern about the potential risks of AI overuse, reflected in a mean score of 3.66 (SD = 0.75).

The most frequently cited challenges included:

- Dependence on AI for assignments and decision-making,
- Reduced creativity and critical self-reflection,
- Ethical concerns related to plagiarism and data privacy.

These issues were slightly more emphasized by law students, given the ethical dimension of their field, whereas business students focused more on competitiveness and fairness in AI-assisted recruitment tools. The data reinforce the findings of Zhai et al. (2024), who argue that while AI enhances learning efficiency, it risks promoting passive learning habits and cognitive dependency if not guided by human mentorship and reflective pedagogical design.

4.6. Comparative Analysis

To illustrate the relative strength of students' perceptions across domains, Figure 2 presents a comparative view of the mean values across the four questionnaire sections.

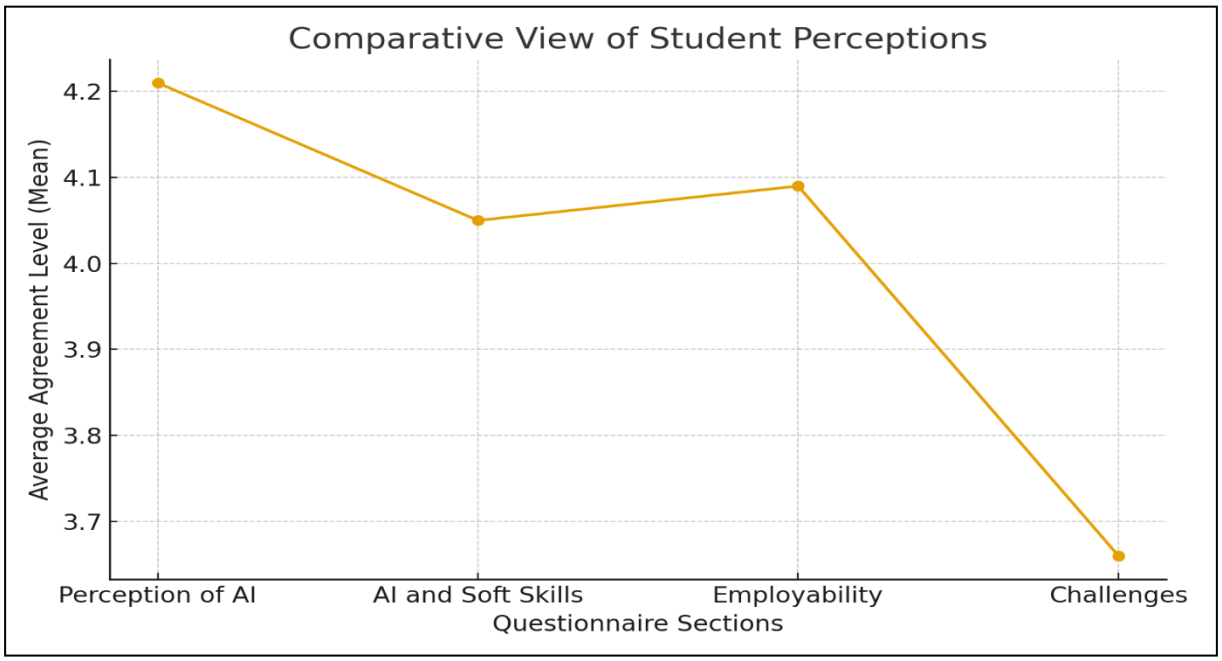

Figure 2. *Comparative view of students' perceptions of AI*

Figure 2 shows that students rated AI perception and employability highest, followed closely by soft skill development, with challenges rated the lowest. This pattern suggests that students value AI's contribution to professional readiness more than they worry about its drawbacks. Overall, the results confirm a balanced yet optimistic perception among Moroccan university students: AI is viewed as an enabler of employability and a facilitator of soft skills, provided its use remains ethical and human centered.

5. Conclusion

The present study examined the perceptions of law and business management students regarding the integration of Artificial Intelligence (AI) in the development of soft skills and employability competencies. Findings from the questionnaire revealed an overall positive perception of AI's educational role, with students acknowledging its effectiveness in improving communication, collaboration, and analytical thinking. Participants recognized that AI-powered tools facilitate autonomous learning, problem-solving, and decision-making, all of which are central to future professional success.

However, despite the optimism surrounding AI's pedagogical potential, students also expressed measured concerns about its limitations. They noted that excessive dependence on AI may reduce creativity, limit emotional intelligence, and diminish interpersonal engagement, skills that remain indispensable for human interaction and leadership. These findings emphasize that while AI can enhance employability, it cannot replace the human dimension of education and professional growth.

Overall, the results confirm that AI should be viewed not as an alternative to human capability but as a complementary instrument that supports skill development when used ethically and critically. Both law and business management students in Moroccan higher education appear ready to embrace AI as a strategic educational partner, provided that its use is guided by clear pedagogical objectives and ethical frameworks.

Based on the findings, several recommendations are proposed for educators, institutions, and policymakers:

1) Curriculum Integration of AI-Based Pedagogies

Universities should design curricula that integrate AI-supported learning environments into core courses, particularly those focusing on communication, critical thinking, and teamwork. This would allow students to develop practical digital fluency alongside traditional academic competencies.

2) Emphasis on Human-Centered Learning

Educators should ensure that the use of AI remains balanced with interpersonal learning experiences. Group projects, debates, and simulations should complement AI-driven exercises to maintain the development of empathy, creativity, and ethical reasoning.

3) Continuous AI Literacy Training

As table 4 indicates, students strongly agreed that AI helps acquire digital literacy. Therefore, both students and instructors need regular training sessions on the ethical and practical use of AI tools. Workshops on data privacy, academic integrity, and algorithmic bias would equip learners with the critical awareness necessary for responsible AI use.

4) Institutional Support for Employability-Oriented Skills

Higher education institutions should collaborate with employers to map soft skill requirements in the labor market and tailor AI-assisted learning tools accordingly. This alignment ensures that graduates possess not only theoretical knowledge but also market-relevant digital and interpersonal skills.

Further research should explore how AI influences discipline-specific soft skills (e.g., negotiation in law, leadership in business) using mixed-methods designs. Longitudinal studies could assess how sustained AI exposure impacts actual employability beyond perception-based evidence.

This study reinforces the notion that the integration of AI in higher education represents both technological advancement and pedagogical responsibility. To maximize its benefits, institutions must foster human-AI synergy, one that values critical thought, creativity, and empathy as much as digital competence. Only through such balance can AI truly serve as a catalyst for sustainable employability and holistic human development in Moroccan and global educational contexts.

Disclosure Statement

The authors declare that there is no conflict of interest regarding the publication of this article. No financial, personal, or professional relationships have influenced the research, analysis, or conclusions presented in this work.

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