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The Core Competency Requirements of University Students in the Age of Artificial Intelligence and the Direction of Educational Reform

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Abstract: Artificial intelligence (AI) is transforming the job market, challenging college students' competencies and higher education systems. This study employs a literature review, 155 questionnaires, and 16 semi-structured interviews to assess students' competency needs and their alignment with educational offerings in the AI era. Findings reveal AI's dual impact: 72% and 46% of respondents note improved efficiency and new jobs, while 66.67% and 61.9% express concerns over job displacement and skill demands, with 48.61% lacking programming knowledge and 66.67% lacking adaptability. The proposed "Five Forces Model" (thinking, learning, expression, creativity, perception) advocates curriculum reform, school-enterprise collaboration, and practical projects. An 84% employment rate from a job-seeking training camp confirms this approach's viability. Despite limitations in sample scope and qualitative depth, the study offers a theoretical and practical framework for AI-era talent development, urging education to align with market needs to boost student competitiveness.

Keywords: AI empowerment era, core competence of college students, five forces model, education reform, employment market

1. Introduction

1.1 Research background and significance

Artificial intelligence (AI), a pivotal force in the fourth technological revolution, is reshaping the global labor market. AI applications have extended from technical domains to industries like education and healthcare [1]. In September 2024, OpenAI's o1 series model outperformed human doctoral-level reasoning, signaling a technological leap and raising challenges for education and professional skills[2]. Concurrently, DeepSeek's innovations accelerate these changes, heightening workforce skill demands. College students, future labor market participants, experience AI's dual impact: it creates new roles, such as generative AI system applicators, while displacing traditional jobs and intensifying competition[3]. Research indicates AI-driven employment shifts affect students' job-seeking mentality, balancing technological optimism with adaptability concerns[4]. This study examines AI's impact on college students' core competencies, offering data to optimize higher education curricula and enhance employability. It also informs government education policies to promote high-quality employment [5], holding both academic and practical significance for socioeconomic development.

1.2 Research objectives and methods

This study investigates college students' AI-era competencies and proposes higher education reforms to address AI's

job market impact. It analyzes AI's effects, develops an empirical competency framework, and suggests reforms. Using mixed methods—a literature review, 155 Shanghai student questionnaires (Cronbach's Alpha=0.850, KMO=0.626) , and 16 interviews —it identifies competency needs and supports systematic training for workplace adaptability.

2. Core ability needs of college students in the AI era

Artificial intelligence (AI) is reshaping the global employment market, challenging college students' core competencies. AI's expansion from technology to tertiary industries has dual effects: it boosts efficiency and creates new roles, but also displaces traditional jobs and raises skill demands, intensifying employment competition. As future workforce leaders, college students must develop capabilities to adapt to these changes and remain competitive. This study analyzes empirical data to assess students' competency gaps in the AI era and proposes a systematic training framework to guide educational reform and personal development.

2.1 Impact of AI on the employment market

AI's employment market impact has dual effects. Surveys show 72% of students see improved efficiency, 46% recognize new roles, and 52% note career opportunities (Figure 1) , but 66.67% fear job displacement and 61.9% see retraining needs (Figure 2) . With 62.7% noting high-skilled role demand, the AI-era market presents opportunities and challenges, requiring enhanced student competencies.

Figure1 Positive Impacts of AI Technology on Current Job Prospects

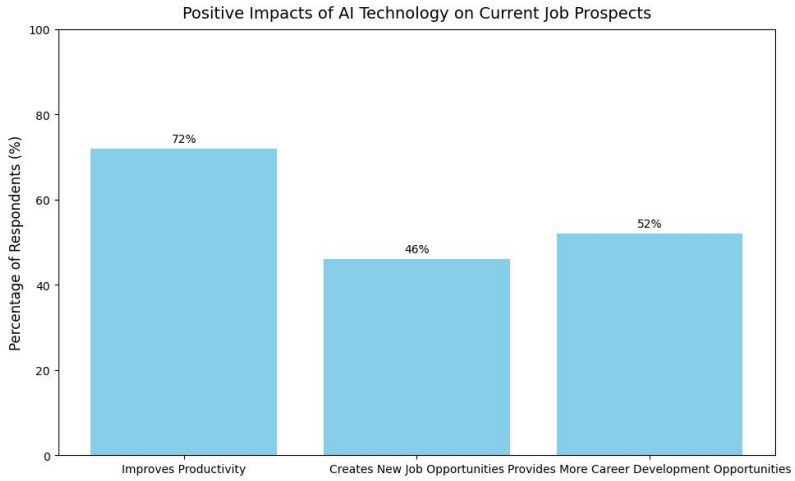
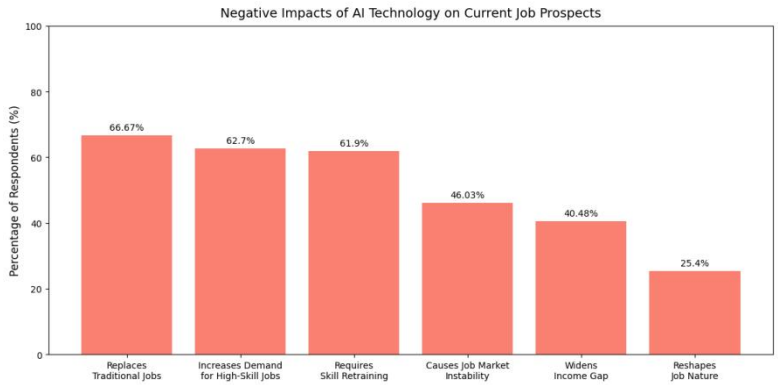


Figure2 Negative Impacts of AI Technology on Current Job Prospects



2.2 Insufficient core competencies

AI's transformation of the job market highlights college students' core competency gaps. Survey data indicates that among students viewing employment as grim, 48.61% lack programming and algorithm knowledge, and 33.33% lack data analysis skills (Table 1) , undermining competitiveness in tech-driven roles. Soft skill deficiencies are notable: 66.67% lack adaptability, 58.33% report weak stress resistance, and 47.22% struggle with emotional management (Table 1). Additionally, 61.93% perceive a grim employment situation, reflecting anxiety over mismatched skills.

Interviews confirm students' unpreparedness for AI-driven skill changes, underscoring traditional education's failure to meet AI-era demands.

Table 1: Relationship Between University Students' Perception of Job Market and Self-Assessed Ability Deficiencies

Perception of Job Market	Adaptability (%)	Lifelong Learning (%)	Teamwork (%)	Stress Resistance (%)	Emotional Management (%)	Programming & Algorithms (%)
Very Severe	66.67	37.5	37.5	58.33	45.83	45.83
Severe	38.89	44.44	27.78	44.44	47.22	48.61
Moderate	32.61	32.61	32.61	43.48	32.61	43.48
Relaxed	58.33	33.33	16.67	41.67	8.33	25.0
Very Relaxed	100.0	0.0	100.0	0.0	0.0	0.0

2.3 Proposal of the Five Forces Model

This study proposes the "Five Forces Model" to foster college students' core competencies in the AI era, encompassing critical thinking, learning, expression, creativity, and perception Critical thinking addresses AI's limitations in complex analysis; learning promotes interdisciplinary knowledge and lifelong learning; expression enhances interpersonal and AI interaction skills; creativity leverages AI for innovation; and perception fosters adaptability and market awareness. Survey data underscores the model's relevance: 61.11% of students have fragmented AI understanding, indicating weak learning ability, while job-hunting pressures highlight needs for perception and critical thinking. Integrating hard and soft skills, the model offers systematic guidance for students to thrive in AI-driven workplaces.

3. Current inadequacies of higher education

3.1 Resource and course limitations

The scarcity of AI-related resources and courses in universities hinders students' competency development. A survey revealed that among students perceiving a severe employment situation, 37.5% found AI-related resources and courses "not enough," and 16.67% deemed them "completely insufficient." Many AI courses lack depth, with limited practical project opportunities, impeding the conversion of theoretical knowledge into skills. Additionally, rapid AI advancements require updated curricula, yet university teaching plans often lag. Although 61.11% of students have only a fragmented understanding of AI, universities fail to offer systematic training, leaving students unprepared for the AI-driven job market.

3.2 Disconnection between student capabilities and market demand

The AI-era job market reveals gaps in college education, with 61.93% of students viewing employment as severe. Only 20.83% value AI skills training, while 66.67% lack adaptability and 48.61% lack programming knowledge (Table 1). Interviews show unpreparedness for skill shifts due to theory-heavy education, failing to produce competitive, versatile talent.

4. Direction of education reform

4.1 Reform suggestions based on the five-force model

The five-force model guides higher education reform to meet AI-era competency needs. Critical thinking is fostered through multi-angle analysis courses and simulations; learning ability is enhanced by introducing AI-related courses and practical training in programming and data analysis; expression skills are improved via speech competitions and AI interactive courses; creativity is stimulated through innovation labs using AI tools; and perception is developed through emotional intelligence and career planning courses to improve adaptability and market insight. These reforms, grounded in the five-force model, address deficiencies in programming (48.61%) and adaptability (66.67%) (Table 1), integrating hard and soft skills to boost students' competitiveness.

4.2 School-enterprise cooperation and policy support

School-enterprise collaboration and policy support are vital for advancing education reform. Universities should enhance industry-education integration by establishing internship bases and joint projects, enabling students to engage in real-world scenarios and improve practical skills, addressing the 37.5% of students who find AI resources "not enough." Concurrently, government policies should provide financial, technical, and data support for AI education projects and industry-university-research platforms. Such collaboration optimizes curricula to align with market demands. Additionally, government-backed job-seeking training camps can boost students' awareness of professional skills, countering the 20.83% who undervalue training, ensuring a seamless education-employment transition.

4.3 Case Verification

The job-seeking ability training camp exemplifies effective education reform. Its six-day intensive program, targeting unemployed graduates, enhances five-force competencies through courses like "Improve My Interview Skills" (expression, perception) and "Discover More Career Opportunities for Me" (learning, creativity). By August 29, 84% of 32 trainees secured employment, with only 5 still jobless, validating the five-force approach. Small-class (≤40 students) and immersive training rapidly boosts core competencies and career clarity. Universities can adopt this model, integrating personalized resources and corporate mentorship to address the 61.11% of students with fragmented AI understanding, offering a practical framework for AI-era talent development.

5. Conclusion

This study underscores the need for college students to enhance critical thinking, learning, expression, creativity, and perception—termed the "Five Forces Model"—to meet AI-era employment challenges. Survey data reveals AI's dual impact: 46% of students recognize new job creation, yet 66.67% worry about traditional job displacement, exposing gaps in programming (48.61%) and adaptability (66.67%). The model addresses these deficiencies, supported by an 84% employment rate from a job-seeking training camp, through curriculum optimization and school-enterprise collaboration, tackling the 37.5% of students citing insufficient resources and 61.11% with fragmented AI knowledge. However, limitations include a Shanghai-centric sample and shallow qualitative analysis, with the model's implementation needing clearer resource details. Future research should diversify samples, deepen AI tool impact analysis, refine model execution, and address ethical job market issues like data privacy, providing strategic support for universities and governments to foster high-quality employment.

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