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Research on the Paradigm Reconstruction of General Education in Artificial Intelligence

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Abstract: Current general education Artificial Intelligence (AI) courses in universities for non-computer science majors are commonly trapped in the misguided positioning of being a "simplified version of computer science major courses," focusing on Python programming and machine learning algorithm principles. This leads to a severe disconnect between teaching content and students' actual needs [4] . This study proposes a paradigm shift from "transmitting technical principles" to "cultivating AI user literacy." The core lies in constructing an "AI User Literacy" framework and designing a "Three-Tier Application-Oriented" curriculum model, including: a Cognitive Foundation Tier (20% of class hours) using metaphors to establish necessary concepts; a Tool Application Tier (50% of class hours) using workshops to master mainstream AI tool usage; and an Intelligent Reflection Tier (30% of class hours) using case debates to foster critical thinking. Teaching implementation adheres to the "no-code" principle, driven by a scenario library and "Smart Toolkit" projects. The assessment system focuses on abilities in tool selection, application process, and ethical reflection. This study provides a systematic solution for addressing the "disconnect between learning and application" dilemma in AI general education[2].

Keywords: Artificial Intelligence General Education, AI User Literacy; Paradigm Reconstruction, Generative Artificial Intelligence, Application-Orientation

1. Introduction

As artificial intelligence technology becomes a fundamental social productive force, the majority of undergraduate institutions in China have established general education courses related to AI. However, current courses commonly exhibit the characteristics of a "simplified version of computer science major courses," focusing on Python programming and machine learning algorithm principles, leading to a disconnect between teaching content and student needs[1].

Interviews and surveys with enrolled students reveal a dual "disconnect" in course effectiveness:

Disconnect between Knowledge Acquisition and Skill Cultivation: Students spend effort memorizing algorithms and syntax but fail to develop the ability to apply AI tools to solve problems in their own fields.

Disconnect between Course Content and Student Needs: Students most desire to learn about AI application cases and risk prevention, but there is a significant gap between this demand and the actual course content.

The root cause lies in a logical mismatch in course design: the supply side follows the logic of disciplinary knowledge transmission, while the demand side follows the logic of problem-solving and literacy development. This traps courses in a vicious cycle of being "difficult to teach, difficult to learn, and useless after learning." To break this cycle, a fundamental paradigm reconstruction is necessary, shifting from "how to teach AI knowledge" to "how to cultivate AI literacy" [3] .

2. Course Paradigm Reconstruction: The "AI User Literacy" Framework

Addressing the current predicament, this study proposes "AI User Literacy" as the core concept for course reconstruction. It focuses on the core needs of ordinary users in the intelligent era, referring to an individual's comprehensive ability to use AI tools and services effectively, safely, and responsibly, and to think critically about their societal impact[5].

The framework comprises five competency dimensions:

(1)Tool Selection Ability

(2)Prompt Engineering Ability

(3)Workflow Integration Ability

(4)Critical Evaluation Ability

(5)Scenario Innovation Ability

This framework marks a fundamental shift in course objectives from "cultivating novice AI developers" to "cultivating informed AI users." Learning theories such as situated learning theory support this shift, emphasizing that learning should occur in authentic or simulated application contexts.

Based on this, the course is repositioned as providing non-computer science majors with a methodology for AI tool application, an experiential field for scenario practice, and a thinking space for ethical reflection. This new positioning involves three core shifts:

(6)From "Principle Knower" to "Tool Master"

(7)From "Knowledge Receiver" to "Scenario Explorer"

(8)From "Technology User" to "Ethical Thinker"

3. Course Design: Three-Tier Application-Oriented Curriculum Model

3.1 Overall Architecture

To translate philosophy into practice, this study constructs a "Three-Tier Application-Oriented Curriculum Model." The model adopts a pyramid structure, from bottom to top: Cognitive Foundation Level, Tool Application Level , and Intelligent Reflection Level (integrated throughout the Tool Application Level), with corresponding class hour ratios of 20% : 50% : 30%. This allocation fundamentally overthrows the traditional course structure dominated by technical principles, embodying the design principle of "application-led, reflection-guided."

No.	Level	Content
1	Cognitive Foundation Level	Introduction to AI
2		Prompt
3	Tool Application Level + Intelligent Reflection Level	Natural Language Processing
4		Computer Vision
5		Speech Recognition
6		Intelligent Search
7		Project Practice

3.2 Cognitive Foundation Level

This level occupies 20% of class hours, aiming to construct the necessary knowledge and conceptual framework. Design Principle: Adhere to the criterion of "minimum necessary knowledge," using metaphors, analogies, and real-life cases to explain, helping students build a basic conceptual map for understanding the AI world.

Core Content Modules:

Introduction to AI （3 Class hours）	AI History
	Multiple Understandings of Intelligence
	How AI "Learns," AI Capabilities and Limitations

Prompt（3 Class hours）	Definition of Prompt
	Prompt Framework: How to Design a Good Prompt?

3.3 Tool Application Level

This is the main body of the course, following the thread of "tool categorization - practical application." It employs a combination of individual practice and group assignments, allowing students to master core usage skills of mainstream AI tools through real tasks.

Application Design and Teaching Arrangement:

	Reference Tools	Core Competency Cultivation	Practical Tasks
Natural Language Processing （ 4 Class hours）	Deepseek	Prompt design, conversation management, information verification	Generate simple content based on requirements
			Generate content with Q&A format
			Generate and optimize a short drama script
Computer Vision（6 Class hours）	Deepseek, Doubao, JiMeng, Keling	Prompt design, style control, iterative optimization	Generate images/videos based on requirements
			Generate images/videos with Q&A format
			Generate a complete video (e.g., short drama)
Speech Recognition （4 Class hours）	iFlyTek	Prompt design, iterative optimization	Add audio to the short drama
Intelligent Search （4 Class hours）	Deepseek	Problem transformation, prompt design	Generate a thesis related to professional content
Project Practice （6 Class hours）	All of the above	Scenario identification, process design	Generate a web-based game
			Generate an interactive HTML courseware

3.4 Intelligent Reflection Level

This level is integrated throughout the Tool Application Level, cultivating students' critical thinking. Above the tools, it embeds deep reflection on social, ethical, and future dimensions. Main topics include: Work Transformation and Career Future (mapping personal competitiveness in the AI era), Information Ecology and Trust Crisis (debate on deepfake identification). Teaching methods primarily include case studies and debate competitions.

4. Teaching and Assessment Innovation

4.1 Scenario-Driven and "No-Code" Practice

Teaching is driven by an "Interdisciplinary Scenario Library" covering real application cases from fields like

Humanities & Social Sciences, Economics & Management & Business, Science & Engineering & Medicine & Agriculture, and Art & Design. The core practice is the "Smart Toolkit" Personal Project, requiring students to use AI tools to solve a real problem, and go through the complete process of "problem definition - tool selection - implementation iteration - effect evaluation," adhering to the "no-code" principle throughout.

4.2 Competency-Oriented Assessment System

Assessment focuses on "knowing how to use" rather than "understanding principles," divided into three levels:

Module	Content	Assessment Weight
Basic Cognition	Open-book test on the understanding and application of core concepts.	20%
Tool Operation	On-site, time-limited completion of specified tool tasks, assessing operational proficiency and process optimization.	40%
Project Practice	Comprehensive scoring based on the report and defense of the "Smart Toolkit" project, from multiple dimensions like problem identification, tool selection, implementation process, and depth of reflection.	40%

5. Implementation Challenges and Countermeasures

5.1 Challenges

Challenge 1: Existing instructors mostly have computer science backgrounds, proficient in technical principles but lacking interdisciplinary application knowledge.

Challenge 2: AI tools have significant updates monthly. Instructors face immense lesson preparation pressure, and teaching content easily lags.

Challenge 3: A single classroom accommodates students from dozens of majors, from liberal arts to engineering, with huge background differences.

Challenge 4: Insufficient institutional emphasis and resource investment in general education courses (currently only 4 full-time teachers).

5.2 Countermeasures

Given the above challenges, it is recommended to adopt a "small steps, quick iterations" approach, prioritizing the categorization of one major field (e.g., Humanities & Social Sciences) from the original foundation, communicating with relevant department faculty about major-specific application content, and integrating it into the AI classroom.

6. Conclusion and Outlook

This study reveals that the root of the AI general education predicament lies in the deviation of course positioning and proposes a comprehensive reconstruction plan targeting "AI User Literacy" with the "Three-Tier Application Model" as the pathway. This paradigm shifts the educational focus from "technical principles" to "empowering people," emphasizing the cultivation of comprehensive literacy in tool application, risk identification, and ethical judgment within authentic scenarios. In the future, with the rapid development of generative AI, course content requires continuous iteration. This reform is not only about a single course but also represents a profound reflection of higher education returning to its essence of educating people and cultivating responsible citizens adapted to the future society in the intelligent era.

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