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On the Systematic Cultivation of AI Literacy Among Higher Vocational College Students Through the "2025 College Students' AI+ Information Literacy Competition"

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Abstract: Against the backdrop of the nation's vigorous promotion of Digital China development and the digital transformation of vocational education, the "2025 College Students' AI+ Information Literacy Competition" emerged. It innovatively constructs a three-dimensional competency model integrating "information literacy → digital literacy → AI literacy." This paper analyzes the systematic enhancement of students' AI literacy capabilities through this competition framework. The competition not only solidifies students' foundations in traditional information literacy, but also proactively integrates digital survival skills in an omni-media environment, alongside the application of intelligent tools and ethical reasoning capabilities in the AI era. This effectively facilitates students' transformation from passive knowledge recipients to active problem solvers and lifelong learners.

Keywords: Information Literacy; Digital Literacy; AI Literacy; Three-Dimensional Integration

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1. Introduction: The Questions of the Era and the Answers of the Competition

The "Overall Layout Plan for Digital China Construction" issued by the CPC Central Committee and the State Council in 2023 clearly states the need to "build a digital literacy and skills development system that covers the entire population and integrates urban and rural areas." For higher vocational education, which bears the responsibility of cultivating master craftsmen and technical experts, how to respond to this era's challenge has become a key issue.

Traditional information literacy education can no longer meet the evolving demands of the intelligent era. Modern skilled professionals must not only be able to search for information, but also think critically, apply knowledge effectively, innovate, and engage in reasoned analysis. Students need to develop comprehensive competencies to accurately identify problems in complex information environments, efficiently integrate resources, skillfully utilize intelligent tools, and adhere to ethical standards[1].

The "2025 College Students 'AI+Information Literacy Competition", guided by the Ministry of Education's Higher Education Institutions Library and Information Work Steering Committee, has provided a resounding answer through forward-looking top-level design. The competition innovatively proposed a three-dimensional literacy model integrating

"Information Literacy → Digital Literacy → AI Literacy", further subdivided into 11 modules as follows:

Module 1: Basic Concepts of Literature Information;

Module 2: Principles of Literature Information Retrieval;

Module 3: Information Retrieval Theory and Technology;

Module 4: Literature Information Retrieval Systems;

Module 5: Common Chinese Commercial Databases;

Module 6: Government Open Information Resources;

Module 7: Practical Learning Resources;

Module 8: Academic Writing;

Module 9: Knowledge Management Tools;

Module10: Research Tools;

Module 11: AI Literacy.

This paper will elaborate on how the competition, through its scientific, systematic, and cutting-edge design, forges students' fifteen core skills in an all-round and in-depth manner.

2. The Dimension of "Information Literacy": Consolidating the Cognitive Foundation for the Intelligent Era

Information literacy is the cornerstone of digital literacy and AI literacy. The first ten modules in the competition content jointly build this solid foundation.

2.1. The Awakening of Information Awareness: From Passive Reception to Active Exploration

Information awareness is the soul of information literacy. It concerns an individual's sensitivity to the value of information, their insight into information needs, and their intrinsic motivation to actively seek solutions.

2.1.1. Skill Enhancement One: Keen Problem-Defining Ability

Module 1 and Module 8 both imply the requirement for problem-defining ability.

For example, in academic writing, a clear, specific, and research-worthy problem statement is the starting point of the entire text. When students can accurately distinguish between "I want to know what AI is" (vague) and "I want to explore the logical vulnerabilities of generative AI in intelligent code generation" (specific), their information awareness has made its first qualitative leap. This ability directly corresponds to the key step of "defining problems" in the workplace and is the basic skill of excellent technical personnel.

2.1.2. Skill Enhancement Two: Efficient Information Need Analysis Ability

The core of Module 2 and Module 3 lies in teaching students how to transform a real-world problem into a searchable query statement[2]. This requires mastering retrieval techniques such as Boolean logic, wildcards, truncation, and field limitation.

For example, requiring students to search in specific fields of a particular book trains their understanding of the structure of information sources and their refined control over search strategies. This ability enables students to quickly determine: "What type of information do I need to solve this problem? Where might this information exist, in which databases or platforms?" This structured way of thinking is a prerequisite for efficient work.

2.2. The Systematization of Information Knowledge: Building an Individual Cognitive Map

Discrete pieces of knowledge are insufficient to meet complex challenges; only by weaving them into a network can a powerful cognitive force be formed.

2.2.1. Skill Enhancement Three: The Ability to Build a Systematized Knowledge Framework

When preparing for the competition, students need to learn a large number of national first-class online open courses. The value of these courses lies not only in imparting skills but also in helping students build systematic cognition. From document identifiers to the underlying logic of databases, from CNKI to VIP, from intellectual property to trademark moats, ... these pieces of knowledge form a complete knowledge framework. Armed with this "cognitive map," students, when confronted with a vast amount of information, are no longer lost travelers but confident navigators who can quickly judge the source, authority, and applicability of information.

2.2.2. Skill Enhancement Four: The Ability to Integrate Interdisciplinary Knowledge

Modules 5, 6, and 7 cover a wide range of information sources, from academic databases such as CNKI and Wanfang, to government data platforms like the National Bureau of Statistics and the Ministry of Industry and Information Technology, and to ubiquitous learning resources such as MOOCs and Bilibili's knowledge zone. The competition requires students to be able to switch and integrate information from different types and fields of sources according to the task requirements[3]. For example, when studying an image recognition algorithm optimization project, it may be necessary to combine the algorithm model from academic journals (Module 5), the special report on the development of artificial intelligence technology released by the Ministry of Science and Technology (Module 6), and practical cases from online courses (Module 7). This cross-boundary integration ability is essential for solving modern complex engineering problems.

2.3. The Refinement of Information Skills: The Transition from Theory to Practice

The value of knowledge lies in its application. The competition tests students' ability to transform theoretical knowledge into practical operations.

2.3.1. Skill Enhancement Five: The Ability to Accurately Acquire and Screen Information

The competition directly examines students' ability to capture and distinguish information details. In the era of information explosion, finding information is not difficult; the challenge lies in finding the right information. The competition trains students to be like detectives, judging the authenticity and relevance of information through subtle clues, such as differences in ISBN versions and characteristics of reference formats. This ability can effectively guard against the spread of online rumors and false information, which is a fundamental quality of digital citizens.

2.3.2. Skill Enhancement Six: The Ability to Organize and Express Information in a Standardized Manner

Module 8 and Module 9 both point to the output end of information. Academic writing trains students to express their ideas in a rigorous logic and standardized format, such as the correct use of terminology and references. Knowledge management tools like EndNote, XMind, and even Excel teach students how to efficiently collect, classify, label, and associate fragmented information, internalizing it as personal knowledge assets. The combination of these two skills enables students not only to "input" information but also to "output" knowledge of high quality, thus forming a personal brand and professional influence.

2.4. The Adherence to Information Ethics: The Moral Compass in the Digital World

Technology is neutral, but those who use it must have ethical guidelines.

2.4.1. Skill Enhancement Seven: Profound Awareness of Academic Integrity and Intellectual Property

The spirit of information ethics permeates the entire competition content. The academic writing module inevitably involves issues such as plagiarism, copying, and fair use. Understanding unique identifiers such as DOI also strengthens respect for original works. Through subtle means, the competition makes students understand that free access to information does not mean unrestricted use. Respecting the intellectual achievements of others is not only a legal requirement but

also a professional code of conduct. This is especially important for vocational students who may engage in research and development, design, and other creative work in the future.

3. The Dimension of Digital Literacy: Forging the Ability to Survive and Develop in the Age of All-Media

If information literacy is the foundation, then digital literacy is the lush branches and leaves that grow on this foundation. It concerns how individuals can thrive in the digital environment.

3.1. The Cultivation of Digital Thinking: The Leap from Linear to Networked

The core of digital literacy is first and foremost a transformation of thinking patterns.

3.1.1. Skill Enhancement Eight: Computational Thinking and Data-Driven Decision-Making Ability

Using data analysis software such as SPSS and Python basic libraries in Module 10, as well as interpreting government open data in Module 6, are all aimed at cultivating a habit of thinking based on data. Students learn to break down complex problems, identify patterns, abstractly model, and design algorithms to solve problems. This computational thinking is a fundamental mode of thinking required for all future positions.

3.1.2. Skill Enhancement Nine: Connected Thinking and Collaborative Innovation Ability

The digital world is a highly interconnected network. The collaborative functions in Module 9, such as CNKI's research and study, and the online community interactions in Module 7, are all aimed at cultivating students' connected thinking, teaching them how to use digital platforms to share information with others, divide labor, and co-create. This ability breaks the limitations of physical space, making cross-regional and cross-disciplinary team collaboration possible and greatly improving innovation efficiency.

3.2. The Application of Digital Technology Tools: The Transition from Consumer to Creator

Mastery of tools is the most intuitive manifestation of digital literacy.

3.2.1. Skill Enhancement Ten: Multi-Media Content Creation and Expression Ability

Digital literacy is not just about "reading," but also about "writing" and "creating." Students ultimately need to be able to produce digital content. Whether it is writing an illustrated research report or making a short video to showcase research results, the corresponding digital creation tools need to be mastered. The information integration and expression ability cultivated by the competition is the foundation of multi-media creation. In the future, vocational students will benefit from this in scenarios such as corporate promotion, product introduction, and technical training.

3.2.2. Skill Enhancement Eleven: The Ability to Build High-Performance Digital Workflows

The various tools involved in Modules 9 and 10, such as reference management, note-taking software, data analysis, project management, etc., ultimately aim to help students build their own efficient digital workflow. This workflow can automate repetitive tasks, reduce cognitive load, and allow creativity to be fully unleashed. For example, using Zotero to automatically manage references, using Notion to build a personal knowledge base, and using Trello to track project progress. This self-management ability is an important part of personal career competitiveness.

3.3. The Awareness of Digital Social Responsibility: Being a Responsible Digital Citizen

With great power comes great responsibility.

3.3.1. Skill Enhancement Twelve: Critical Thinking and Cybersecurity Protection Ability

In the all-media environment, the authenticity of information is hard to discern, and network risks are omnipresent. The competition's repeated emphasis on the authority of information sources and the reliability of information content is essentially a way to temper students' critical thinking. They have learned to question: "Who released this information? What is his motive? Is the evidence sufficient?" At the same time, the promotion of formal databases and government open platforms indirectly educates students to stay away from illegal and high-risk information channels, thereby establishing a basic awareness of network security.

4. The Dimension of AI Literacy: The Key to Embracing the Future of the Intelligent Era

AI literacy is the most forward-looking and revolutionary part of this competition, pointing directly to the future.

4.1. Basic Understanding of AI: Dispelling Myths and Establishing a Scientific Understanding

It is crucial to maintain a clear understanding in the midst of the AI boom.

4.1.1. Skill Enhancement Thirteen: Rational Understanding of AI Principles and Boundaries

Module 11 first requires students to understand what AI is and what it is not. They need to know that the current mainstream AI, especially generative AI, is based on big data and probabilistic statistics for pattern matching, rather than true intelligence or consciousness. This understanding can help students avoid two extremes: one is blind worship, thinking that AI can do anything; the other is to refuse to use any AI tools because of a few negative experiences. Only use based on scientific understanding is safe and efficient.

4.2. The Application of AI Tools: The New Productivity of Human-Machine Collaboration

AI is not about replacing humans, but about enhancing them.

4.2.1. Skill Enhancement Fourteen: The Ability to Apply Intelligent Tools in Specific Scenarios

The competition encourages students to explore how to integrate AI tools into existing information processing workflows. For example, using AI to draft the initial manuscript of a literature review, using AI to conduct sentiment analysis on a large number of user comments, and using AI to generate preliminary plans for data visualization. This is not about turning students into AI developers, but rather into smart AI users. This ability will greatly enhance their work efficiency and creativity, making them stand out in the future workplace[4].

4.3. AI Ethical Standards: Safeguarding the Bottom Line of Technology for Good

This is the most central part of AI literacy and also the part that is most easily overlooked.

4.3.1. Skill Enhancement Fifteen: Profound AI Ethical Reasoning and Compliance Application Ability

AI has brought a series of ethical challenges such as bias, privacy, copyright, and unemployment. Module 11 explicitly lists "AI ethical standards education" as a key point. The competition guides students to think about issues such as: Who owns the copyright of content generated by AI? How should we deal with gender or racial biases in AI models? In what scenarios should we not rely on AI to make decisions? This ability to reason ethically ensures that while students enjoy the benefits of technology, they can also uphold the bottom line of morality and law, becoming a force that promotes the use of technology for good[5].

5. The Fusion Effect of the "Three-Dimensional Integration": Synergistic Enhancement Where 1+1+1>3

The three dimensions of "Information → Digital → AI" are not isolated but are interwoven and empower each other, generating a powerful synergistic effect.

• **Information literacy provides "fuel" for digital and AI literacy:** High-quality information is the foundation for digital content creation and AI model training.

• **Digital literacy provides a "vehicle" for information and AI literacy:** All information processing and AI interactions take place on digital platforms.

• **AI literacy provides an "engine" for information and digital literacy:** AI tools greatly expand the boundaries and efficiency of information processing and digital creation.

For example, when completing a development task for a "campus second-hand book trading platform":

• **Information literacy:** Students need to look up information on the functional design of second-hand trading platforms, relevant laws and regulations, as well as case studies and user reviews of similar apps that others have developed.

• **Digital literacy:** Students need to use programming tools to write code, use databases to store book and user information, and create a clickable mobile interface.

• **AI literacy:** Students can use AI tools to analyze which books are the most popular or to recommend books that users might be interested in based on their browsing history.

This process perfectly illustrates the integration of the three dimensions. The absence of any one dimension would significantly compromise the completion of the task.

6. Conclusion: Learning through Competition, Empowering the Future

The "2025 College Students AI + Information Literacy Competition" is by no means a simple knowledge contest. It is a meticulously designed, future-oriented educational system. Through the three-dimensional integrated literacy model, the competition systematically enhances the fifteen core skills of vocational and specialized college students, including problem definition, information verification, knowledge integration, digital creation, human-machine collaboration, and ethical reasoning.

Looking to the future, with the continuous evolution of AI technology, the connotation of information literacy will surely continue to enrich.

Disclosure statement

The author declares no conflict of interest.

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