Research on Organizational Mechanisms and Preparation Strategies for Higher Vocational College Student Associations to Enhance Competitiveness in AI+ Information Literacy Competitions

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Abstract: *With the rapid expansion of the scale of the competition in the past two years, the Jiangsu division is moving towards large-scale competition which makes it imperative to explore the condition of organized support. Based on the community learning theory taking Wisdom Union—student association from a higher vocational college as a case, by combining division data with analysis of competency demands according to the question-design structure, this paper examines the organization mechanism of Wisdom Union. It shows that the mechanisms of division of labor and collaboration, resource sharing, dynamic updating, and mentoring and transmission convert individual's experience into community capacity; the competitiveness of Wisdom Union increases faster than the expansion of the division; the impact of organized competition preparation on conversion into competition participation and competency continuity can be observed. We then propose the strategies of modular key-problem tackling, principle-based instruction, tiered training, and institutionalized transmission, offering an analytical framework and practical reference for the competition preparation of associations in higher vocational colleges.*

Keywords: *higher vocational colleges; Wisdom Union; AI+ Information Literacy; organizational mechanisms; competition preparation strategies*

Introduction

The scale of participating in the competition increases several-fold over the past two years with both competition density and question design complexity[1] in the Jiangsu division increasing simultaneously. There exists structural limitation in fragmented individual preparation about knowledge coverage and platform tracking; organized support condition becomes an influencing factor affecting competition performance. Discussions mainly focus on individuals' knowledge reserves and test-taking skills but lack systematic investigation on the action of student association's organization mechanism acting upon generating competitiveness. Taking Wisdom Union as a case based on community learning theory, we establish a four-dimensional model: coverage, proficiency, timeliness, and depth of understanding, combining division data and question-design structure analyzing competency demand, and distilling organized competition-preparation mechanisms such as division of labor and collaboration, resource sharing, dynamic updating, and mentoring and transmission. The study transfers competitiveness analysis from aggregating individual abilities towards optimizing community participation structures providing an analytical framework and strategic reference for organizing competitions in higher vocational colleges.

1. Theoretical Framework and Literature Review

1.1 Situated Learning and Community Learning Theory

According to the situated learning theory by Lave and Wenger, learning happens when participating in communities of practice which take you from observing and auxiliary tasks to "full participation" via "legitimate peripheral participation"[2] there are three main components of a community according to Wenger: shared enterprise, mutual engagement, and a shared repertoire, all of them being necessary for maintaining the community and reproducing knowledge[3]: The shared enterprise of Wisdom Union is

competition participation and literacy improvement, regular meetings, training and modular division of labor is the carrier of mutual engagement, concept cards, question banks, and tool comparison materials constitutes the shared repertoire – it has the typical structure of a community of practice. Transforming generating competition competitiveness from aggregating individuals' abilities into an optimization problem about the participation structure of a community, we can get a theoretical anchor to study the relation between the organization mechanism of student associations and the quality of competition preparation.

1.2 Competition-Promoted Learning and Peer-Assisted Learning

Effectiveness of competition-promoted learning stems from the authenticity, time-limited and comparable characteristics of competition tasks (stimulation of learning motivation through competition goals), emphasizing peer-assisted learning with small cognitive gaps among peers (explanation, demonstration, and mutual evaluation) in order for their explanations to be close to novices' confusions and another channel besides teacher guidance for knowledge transmission. The two mechanisms integrate together within the context of students' association: Competition standards become executable learning tasks via modular division of labor; Peer assistance becomes regular training arrangements via mentoring and transmission and paired guidance. Wisdom Union's three-tier training system and module leader system reflects this kind of integration whose theoretical significance lies in understanding the competition preparation as a continuous learning organization process meditated by competition events rather than short-term cramming.

1.3 Construction of the Four-Dimensional Model of Competition Competitiveness

The majority of existing studies focus only on individuals' knowledge reserves and test-taking skills but ignore the source structure of competitiveness in organized competition preparation conditions. Based on the features demonstrated by our 2026 question design[1] such as practical retrieval, broad platform coverage, dynamic timeliness, and precise techniques, we deconstructed the competition competitiveness into four aspects including coverage (blind-spot-free mastery of knowledge points and platform tools), proficiency (speed and accuracy of timed responses on real platforms), timeliness (timely mastery of platform iterations and tool changes) and depth of understanding (mastery of retrieval principles and ability to transfer methods to unfamiliar platforms). The four dimensions are structurally connected; the first dimension is the foundation of breadth, the second one guarantees speed, the third one ensures practical validity, and the last one determines transferability when adjusting question design. Our model closely relates to community theory since improvement from these four dimensions depends on resource repository development, division of labor and collaboration, and experience transmission mechanisms which provides us an observable frame for case analysis.

2. Competition Context and Competency Demands of Question Design

2.1 Data Trends at the National Level and in the Jiangsu Division

In terms of the scale of registrants and participants: An upward trend can be observed at the national level over the past two years[4]; The participation rate is stable, the proportion of non-participation among registrants increases synchronously with it; The scope of competitions and participation base continues to expand but changes according to the scarcity and recognition of awards (as shown in Table 1) In terms of the Jiangsu division, the number of registrants and participants has characteristics of staged leaps; The participation rate exceeds the national average; The proportion of those registrants who do not participate still occupies a certain proportion; The competitive landscape of this division changes from small-scale participation to large-scale competition (as shown in Table 2), the proportion of registrants and participants in the total numbers of the division at the national level as well as the comparison between the annual growth rate of participants compared to that at the national level indicates that the expansion rate of the division is faster than the national average (as shown in Table 3). Structural changes in the division's scales put higher demands on preparing organized competition; Efficiency of registration to actual participation become one of the basic variables affecting the competition performance by institutions; There is obvious room for effect of association-based organizations to increase the participation conversion rate and the effectiveness of competition preparation.

Table 1 Registration and Participation at the National Level

Indicator	2025	2026	Increase	Growth rate
Number of registrants	130564	281306	150742	115.5%
Number of participants	93900	200822	106922	113.9%
Participation rate	71.9%	71.4%	A decrease of 0.5 per centage points	—
Number of registrants who did not participate	36664	80484	43820	119.5%

Table 2 Registration and Participation in Jiangsu Province

Indicator	2024	2025	2026
Number of registrants	Not obtained	5,410	14,950
Number of participants	248	4,107	11,097
Participation rate	—	75.9%	74.2%
Number of registrants who did not participat e	—	1,303	3,853

In terms of the number of registrants, from 2025 to 2026, the number increased by 9,540, a growth of 176.3%.

The change in the number of participants has three stage characteristics:

From 2024 to 2025: the number increased by 3,859, approximately 16.6 times that of the previous year,

From 2025 to 2026: the number increased by 6,990, a growth of 170.2%,

From 2024 to 2026: the number in 2026 was approximately 44.7 times that in 2024.

Table 3 Comparison of Main Indicators between Jiangsu and the National Level

Indicator	2025	2026
Proportion of Jiangsu's registrants in the national total	4.1%	5.3%
Proportion of Jiangsu's participants in the national total	4.4%	5.5%
Jiangsu's participation rate	75.9%	74.2%
National participation rate	71.9%	71.4%
Extent to which Jiangsu's participatio n rate exceeds the national rate	4.0 percentage points	2.8 percentage points
Annual growth rate of participants (Ji angsu/national)	—	170.2% / 113.9%

2.2 Question-Design Module Structure and Platform-Tool Map for 2026

2026 Question Design Based on the three-dimensional literacy of information literacy, digital literacy, and AI literacy; Eleven modules with different numbers of knowledge points assigned for each module; Varying levels of knowledge density and technical difficulty (Table 4); Technical core: The principles of document information retrieval and theories and techniques of information retrieval are involved in most retrieval type test questions; The open information resources module has the largest number of knowledge points involving multiple resource systems; Number of knowledge points in AI literacy module does not match actual volume examined, designated tool list and scenario subdivision makes actual coverage exceeds the apparent scale implied by number of knowledge points. Features: Practical retrieval, Broad platform coverage, Dynamic timeliness, Precise techniques, AI frontiers, Value guidance; Most sample question analysis indicates operational path and result verification on specific system; Platform-tool map covers Chinese and foreign academic resources, commercial databases, various types of intelligent tools; Platform functions and tool versions constantly updated; Timeliness verification of competition preparation materials is a regular step when answering the question design.

Table 4 Question-Design Module Structure for 2026

Module	Name	Number of Knowledge Points	Key Examination Points and Typical Platforms
M1	Basic Concepts of Document Information	4	Concepts of information literacy, types and levels of literature, ISBN and DOI, information ethics and security
M2	Principles of Document Information Retrieval	5	Retrieval languages, retrieval approaches, recall and precision, AI-enhanced retrieval, Chinese Library Classification
M3	Theories and Techniques of Information Retrieval	7	Retrieval syntax, advanced retrieval, Boolean logic, truncation, exact and fuzzy matching, field limitation, result filtering
M4	Document Information Retrieval Systems	5	Web indices, industry portals, academic search, library holdings queries, open access and preprints
M5	Commonly Used Chinese Commercial Databases	5	CNKI, VIP, Wanfang, examination-related databases, Chaoxing Huiya
M6	Government Open Information Resources	10	Ideological and political education, statistics, law, standards, patents, trademarks, anti-fraud, medical and health, culture and education, certificates
M7	Practical Learning Resources	3	Open courses, enterprise information queries, Q&A communities
M8	Academic Writing	5	Paper structure, writing assistance tools, submission process, GB/T 7714, academic ethics
M9	Knowledge Management Tools	4	Reference management, mind mapping, note-taking software, questionnaire surveys
M10	Research Tools	4	Data processing, academic evaluation, literature and data visualization, literature tracking
M11	AI Literacy	3	AI fundamentals and ethics, commonly used AI tools and prompts, office/research/multimodal/agent scenarios

2.3 Correspondence between Competition Competency Requirements and the Four-Dimensional Elements

The Question Design Features requires certain competition competencies corresponding to the four aspects of coverage, proficiency, timeliness, and depth of understanding respectively: Coverage corresponds with the requirements of broad platform coverage and full module coverage which point at blind-spot-free mastery of knowledge points and tool entry points; Proficiency corresponds with the requirements of practical retrieval and precise techniques which point at the speed and accuracy of timed operations on real platforms; Timeliness corresponds with the requirement of dynamic timeliness which point at timely tracking of platform function iterations and tool version changes; Depth of understanding corresponds with the requirements of AI frontiers and transfer to unfamiliar platforms which point at the level of mastery of retrieval principles and technical logic. The four elements mutually constrain each other in the context of question design – insufficient coverage magnifies the marginal cost of proficiency, lack of timeliness undermines the practical validity of existing proficiency, and depth of understanding defines a feasible space for competency transfer when adjusting question design. This correspondence provides an ability dimension analysis base for modular division of labor, allocation of training priorities, and development of resource repositories during association-based competition preparation.

3. Wisdom Union Case and Competitiveness Formation Mechanisms

3.1 Development Stages and Performance Evolution

The Wisdom Union's competition journey has been divided into three stages: initial stage, leap stage, and consolidation stage with different combination of division scale, award level, and stage

characteristics as shown in Table 5. The initial stage features small numbers of participants in the division, organizational work undertaken by the faculty advisor during the second half of 2024, few preparation periods, and participation and winning awards in that year – which indicates that the combination of professional guidance and student association organization can produce basic competitiveness within a relatively short period of time. During the leap phase, the number of participants in the division greatly expands, the competition density increases, the award level of the association also improves at the same time but the speed of competitiveness improvement surpasses the rate of division expansion; therefore, we cannot attribute the change in performance due to the factor of division scale. The consolidation stage sees continued expansion of the scale of the division, increased ratio of first-time participants, and the association entering a stage of maintaining its performance while facing the limit of diminishing marginal utility for existing experience and materials. We see the evolutionary process of an organized competition-preparation system going through from initial establishment to continuous improvement across three stages, where the asynchronous relationship between performance evolution and division expansion becomes the key observation point of this case.

Table 5 Wisdom Union's Competition Journey

Stage	Time	Number of participants in Jiangsu	Award	Stage characteristics
Initial stage	2024	248	Jiangsu Provincial Second Prize	The faculty advisor took over in the second half of the year, and the association organized participation and won an award in the same year.
Leap stage	2025	4,107	Jiangsu Provincial Special Prize	The division scale expanded by approximately 16.6 times, and the award level rose to the highest level.
Consolidation stage	2026	11,097	To be announced	The division scale was approximately 2.7 times that of the previous year, and the association entered the title-defense stage.

3.2 Operational Mechanisms of Organized Competition Preparation

Wisdom Union's competition preparation is achieved through four kinds of mechanisms — division of labor and collaboration, resource sharing, dynamic updating, and mentoring and transmission that form an organized structure. The division of labor and collaboration mechanism based on module grouping in which each group carries out knowledge organization, platform exploration, and intra-group tutoring under the module leader system transforming the question design scope into specific training tasks; resource sharing mechanism by establishing a unified knowledge base in which central concept cards, self-compiled question banks, and tool comparison tables are iteratively updated every year turning individual experiences into reusable resources; dynamic update mechanism by setting up timeliness verification steps for platform function iterations and tool version changes reducing risk of materials becoming invalid; mentoring and transmission mechanism by award-winning members acting as junior mentors offering paired guidance to new members connecting with the three-tier training system creates a growth path from peripheral participation to undertaking module tasks. Four mechanisms transform fragmented individual accumulation of competition preparation into organizing capacity at community level whose role is to alleviate the pressure of personnel turnover and experience discontinuity caused by the short duration of higher vocational programs.

3.3 SWOT Analysis and Identification of Key Issues

Strengths include accumulated competition results, professional guidance, organization form, and disciplinary background. Teachers of software major can explain principles level of retrieval techniques, data processing, and AI technologies; Student association mechanism is suitable for division of labor and collaboration and experience transmission. Weaknesses include relative weakness in academic retrieval, relatively short turnover cycle of personnel, limited access to some resources, and lack of familiarity with resources in other fields. Opportunities arise from increasing impact of the competition, public release of question-design plans with clear orientation, enough learning resource available, and increase of willingness to participate on campus. Challenges include maintenance of performance pressure, rapid expansion of division scale, invalidation of materials because of platform iterations, and

insufficient experience coverage because of question-design adjustment. Cross-examining these four kinds of factors shows that there are three key problems about conversion of stage-specific performance into sustained organizational capacity, maintaining continuity of knowledge assets under the condition of personnel turnover, preservation of room for competency transfer amidst dynamic changes in question design – which become the starting point for our subsequent strategy design.

4. Competitiveness Enhancement Strategies and Quality Assurance

4.1 Competitiveness Enhancement Strategies

Competitiveness Enhancement Strategy Based Upon Four-Dimensional Model Modular group-based key problem tackling includes knowledge points and platform tools; Module leader system converts design scope for questions into specific training tasks. Query language is used as frame teaching retrieval techniques explain the use of Boolean logic, truncation, and field limitation from logical layer, matching layer, and field layer, cultivate cross-platform transferability. Promote AI literacy at three levels: cognition, application, and development transform concept cards into a retrievable knowledge base using same-question tool comparison and agent construction. Online courses, concept cards, and authentic literature practice targeting weaknesses in academic retrieval, expand familiarity with non-specialist resources by cross-disciplinary collaboration. Tiered training through the three-tier training system and on-campus selection contest, include question-by-question review and establish error records. Institutionalize transmission of knowledge assets through competition preparation white paper and shared knowledge base, reduce the risk of experience discontinuity due to personnel turnover.

4.2 Organizational Guarantee and Quality Monitoring

Organizational guarantee: Responsibility for overall planning and professional quality control (faculty advisor), Daily organization and progress management (association president) and Module material development and intra-group tutoring (module leaders). Weekly regular meetings ensure a training rhythm. Resource guarantee: Access channels and designated training venues in databases adjust according to the scale of participation. Incentive guarantee: Linking student association points with awards and selection, integrating competition awards into comprehensive quality evaluation and the second-classroom credit system. Quality monitoring: Control the quality of question banks throughout the process of question drafting, review, field testing, and finalization; Calculate stage-specific accuracy by module and adjust training priorities accordingly; Verify timeliness of materials before competitions; Track data dashboards to correct competition-preparation strategies so that competition-preparation activities can be kept running even if there's personnel turnover or adjustment in questions design.

References

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