RESEARCH ON THE CONSTRUCTION OF A HIGHER EDUCATION KNOWLEDGE MANAGEMENT MODEL BASED ON THE INTEGRATION OF SHADOW TEAMS

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Abstract. With the advancement of technology and the development of globalization, higher education institutions are facing increasingly complex knowledge management challenges. Shadow team usually refers to an informal and flexible team, where different departments or fields work together to promote knowledge exchange and integration, and stimulate innovative thinking. In order to enhance the knowledge management capabilities and competitiveness of higher education knowledge management institutions, this study will integrate shadow teams, construct a knowledge management model for higher education training enterprises, and use Analytic Hierarchy Process and Fuzzy Comprehensive Evaluation Method to construct an evaluation model for knowledge management capabilities of higher education training enterprises. The research results indicate that compared with traditional knowledge management models, the knowledge management model of higher education training enterprises integrating shadow teams collects 253 and 164 pieces of intelligence information at the 60th second, respectively; When the intelligence information is 300 pieces, the effectiveness of the analysis of the two models is 87.2% and 39.5%, respectively. An empirical analysis was conducted on a certain postgraduate entrance examination institution, and it was found that compared to students who reviewed independently, most of the students who participated in the training had significantly higher grades than those who did not receive training. The higher education knowledge management model that integrates shadow teams has stronger knowledge management capabilities and higher competitiveness.

Key words: Shadow Teams; Higher Education; Knowledge Management; Competitive Intelligence; Competency Evaluation; Training Companies

1. Introduction. With the development of information technology and the advent of the knowledge economy, competition among modern enterprises has become increasingly fierce, the competitive environment has become more complex, and the means of competition have become more diverse. Therefore, in order for enterprises to survive and develop in competition, they need to continuously improve their competitiveness. Competitive intelligence and knowledge management can promote enterprises to enhance their competitiveness. As a new technology, it is widely used in modern enterprise management and has become an important tool for enterprise management. Currently, higher education institutions are facing increasingly complex knowledge management challenges. With the rapid development of information technology, the amount and types of educational data are exploding, which poses higher requirements for knowledge management systems [3]. However, existing systems are often limited to simple organization and classification of collected data, and have not fully utilized this data to promote the improvement of education quality and optimization of management decisions [4]. Shadow team is a multidisciplinary and collaborative working group dedicated to solving problems in parallel informal environments and collaborating with formal teams. Shadow teams can bring new insights and solutions to organizations, thereby driving innovation and development [5]. The aim of this study is to explore and validate a new knowledge management model that integrates the concept of shadow teams, with the aim of improving the efficiency and innovation capabilities of knowledge management in higher education institutions through this integration. A systematic analysis and evaluation of it will help to better understand the current situation and potential of its knowledge management. Therefore, in order to promote the core competitiveness of higher education and training enterprises such as postgraduate entrance examination institutions, integrate shadow teams, effectively integrate knowledge management with competitive intelligence, construct a higher education knowledge management model, and construct an evaluation model for the knowledge management ability of higher education and training enterprises, to evaluate their knowledge management ability.

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2. Related Works. With the development of our society, knowledge is becoming more and more important, and the importance of knowledge in turn makes it increasingly important for enterprises to carry out knowledge management. For modern enterprises to enhance their knowledge management capabilities and to use knowledge as an intangible asset to create knowledge value in a sustainable manner, thereby enhancing the company's market competitiveness, numerous scholars have launched research on knowledge management.

Enis et al. used a qualitative approach to analyses the relationship between higher education partners based on a knowledge management perspective in order to promote the development of higher education in view of the important role of knowledge management in assisting partnerships to synergies knowledge and strengthen market competitiveness. The findings of the study showed that nurturing is the key to effective knowledge management and that effective knowledge management can facilitate collaboration in the higher education sector [6]. Horban used knowledge management to improve the management model of higher education institutions in order to enhance the quality of higher education, the results of the study showed that adding small additional projects can enhance the quality in higher education management [7]. Jarrahi et al. carried out personal knowledge management and knowledge construction in response to the emphasis of personal knowledge management on individual knowledge workers acquiring knowledge in the organizational environment. practice to analyses personal knowledge management activities, the results of the study showed that shadow information technology can facilitate consultancy management while supporting the construction and practice of personal knowledge base and knowledge management and help organizations to promote a balance between knowledge management strategies and personal knowledge goals [8]. Kranz et al. In order to study the impact information generated by shadow environmental management information systems on the environment in a chemical product in order to study the implementation of shadow strategies in a chemical products company, the results of the study showed that shadow EMIS can contribute to ecological sustainability [9]. Altmay et al. evaluated higher education practices in different countries in order to study the implementation of knowledge management in higher education institutions in distance education, using Nvivo qualitative data to analyses the results of the evaluation, the results of the study showed that knowledge management and sharing, the role of teachers and digital competencies play an important role in distance education [10]. The above studies show that knowledge management plays an important role in educational institutions. This is particularly true for higher education training companies, which are typically knowledge-intensive enterprises. It is also possible to identify from the above studies that shadow strategies also have an important impact on knowledge such as information, so this study will integrate shadow teams, construct a model of knowledge management in higher education and evaluate its knowledge management capabilities.

3. Building a higher education knowledge management model based on fused shadow teams.

3.1. Construction of the shadow team. Shadow teams originate from consulting firms, some of which provide customers with a basis for decision making and obtain information from competitors about strategy choices, thus forming a small team to track, analyze and forecast the situation of competitors required by target customers. The shadow team integrates the existing knowledge resources of the enterprise with the existing knowledge and findings of the enterprise, and organically combines the enterprise's knowledge management system with the competitive intelligence system, thus providing a strong support for the enterprise's strategic decision-making. In terms of key features, shadow teams are part of the competitive intelligence system, but their functions are different from those of the competitive intelligence system. Shadow teams can effectively integrate an enterprise's knowledge and intellectual capital, and can effectively analyze an enterprise's competitive situation, which is also an important tool for determining core competencies. By integrating the company's intellectual capital, the shadow team analyses the environment in which the company operates, identifies the company's core competencies and ensures that the company has an advantageous position in the competition.

Shadow teams are people selected from various functions in an organization who form a small, highly competitive team that tracks competitors' actions and mimics their next strategy to inform senior decision makers. The composition of a shadow team is shown in Figure 3.1.

Members of the shadow team track competitor divisions and implement monitoring, modelling and forecasting in order to provide dynamic decision support to decision makers, and their number can vary depending on the job content and the competitor. It is particularly important to note that the liaison person has the special feature of being either an intelligence specialist, a team leader or a member of the shadow team, acting
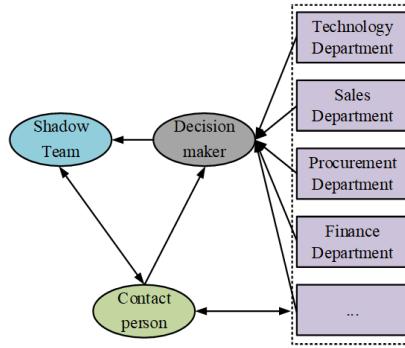
Fig. 3.1: Composition of shadow teams

as a bridge between senior decision makers and junior staff and the shadow team [11]. Usually, the shadow team is relatively small and the number of people is sufficient as long as the task can be accomplished.

This study advocates that the determination of shadow team members should be based on objectives. If the objective is simply to get to know a competitor, only one team is needed. In this case, a team of 3-5 people is basically adequate. If the objective is to achieve an important strategy or to contribute to the long-term development of the company, a larger team is required to achieve the objective. In this case, there are more than ten or even twenty people in a team, who can be divided into several groups and act together.

When setting up a shadow team, it is also important to choose a liaison person or two to help them achieve their goals. The liaison person is an important member of the management team and handles communication with other departments or teams, in addition to communication within the team and at the leadership decision level. The number of liaisons can be determined by the size of the team. When selecting a liaison person, it is best to choose someone who has sufficient time and is able to communicate with the company's decision makers as well as the ground floor staff.

3.2. Model building for the integration of knowledge management and competitive intelligence in higher education. For competitive intelligence and knowledge management to perform their functions simultaneously, they must be supported by the appropriate organization. The integration of knowledge management and competitive intelligence within an enterprise is a key step in achieving this within the enterprise. The principles of organizational integration include the demand-driven principle, the principle of communication sensitivity, the principle of information sharing, and the principle of flexibility of organizational structure [12]. If an enterprise is to gain its competitive advantage in a fiercely competitive market, its organizational structure must have a high degree of flexibility and market adaptability. Based on the principles of organizational integration analyzed earlier, an organizational structure that integrates an enterprise's knowledge management with competitive intelligence is established, as shown in Figure 3.2.

As shown in Figure 3.2, based on the concept of shadow teams, adhering to the principles of driving, communication sensitivity, information sharing, and organizational flexibility, external information sources of the enterprise are formed through enterprise intelligence strategic alliances, industry research companies, experts, or consulting companies. Transferring it to the internal organization, the CEO manages the knowledge and intelligence department, which is mainly composed of the competitive intelligence division, knowledge management division, and shadow team. And connect with functional department bridging personnel to form the organizational structure of the enterprise knowledge management and competitive intelligence integration model [13]. The integrated knowledge management and competitive intelligence departments will be unified as the knowledge intelligence department, thus providing new ideas and methods for the knowledge management and competitive intelligence work of enterprises. In the knowledge intelligence department, a knowledge intelligence leader will be established to provide unified guidance to the work of the enterprise's knowledge management sub-department, competitive intelligence sub-department and shadow team, so as to effectively integrate
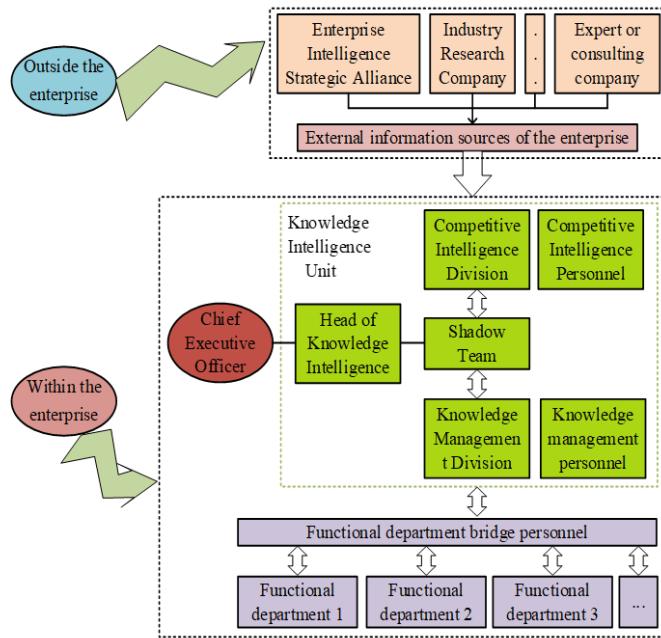
Fig. 3.2: Organizational Structure of Integrating Enterprise Knowledge Management and Competitive Intelligence

competitive intelligence and knowledge management with the enterprise's strategic planning and competitive strategies, thereby improving the enterprise's competitiveness. The shadow team is an intelligence team jointly formed by personnel from different functional departments, integrating the organization's internal knowledge assets and external information, and conducting analytical and research-based research on them with the organization's strategy and decision-making in mind, thus enabling the transformation of the enterprise's knowledge into active intelligence and promoting the integration of knowledge management and competitive intelligence. Functional bridging staff refers to full or part-time knowledge management and competitive intelligence staff in various functional departments [14].

An analysis of the processes of enterprise knowledge management and competitive intelligence activities reveals that the processes of the two have an inter-integration relationship. In this inter-integration relationship, the enterprise knowledge and intelligence information sharing platform plays a key role as a bridge. Therefore, this research constructs a process integration model of enterprise knowledge management and competitive intelligence based on the enterprise information sharing platform for the purpose of enterprise decision-making application, as shown in Figure 3.3.

Figure 3.3 shows that the ideas, methods and technologies of knowledge management are introduced into the process of competitive intelligence, reconstructing the competitive intelligence workflow of the enterprise. Through this model, the process of combining knowledge management and competitive intelligence can be effectively promoted, and advanced knowledge management ideas and technologies are applied to improve the methods of competitive intelligence and enhance the competitive intelligence capability of enterprises.

3.3. Knowledge management capability evaluation model construction for higher education training enterprises. The assessment index system of knowledge management capability is a complex and dynamic system, and when establishing the evaluation index system, it should start from various aspects. To ensure the accuracy of the assessment results, the principles of scientific and feasibility, comprehensiveness and systematicity, and a combination of objectivity and adaptability should be followed in designing the indicator system [15].
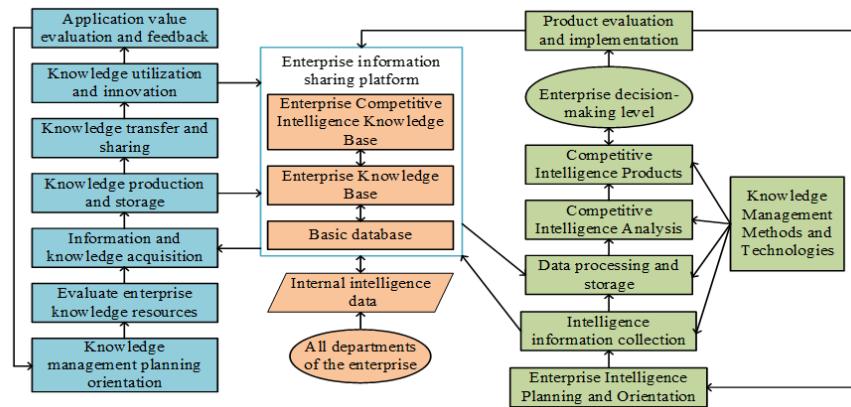
Fig. 3.3: Knowledge Management and Competitive Intelligence Process Integration Model
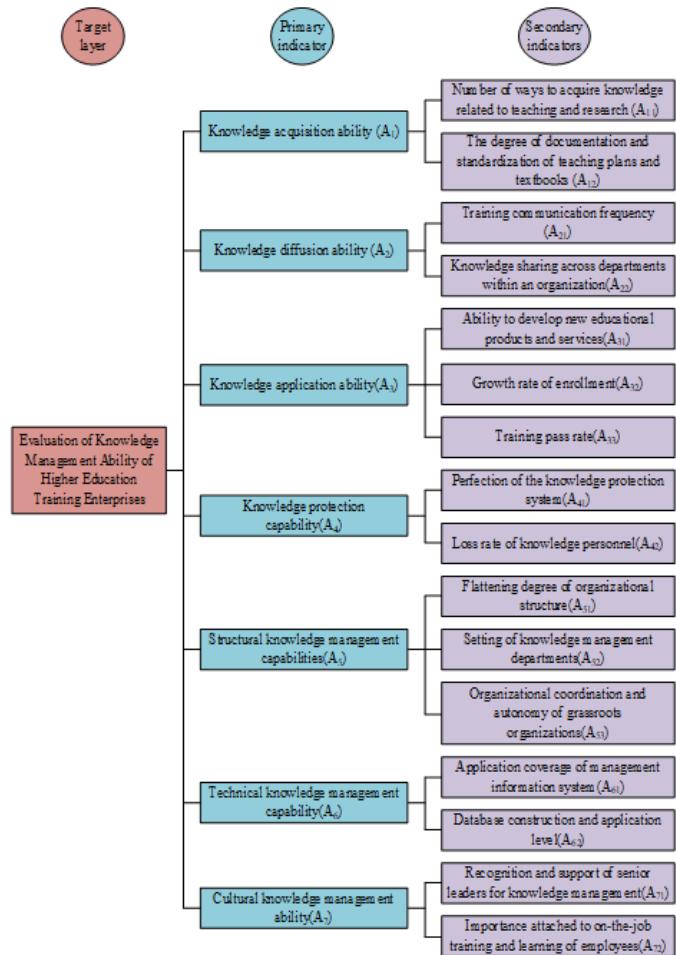

Fig. 3.4: Evaluation Index System for Knowledge Management Ability of Higher Education Training Enterprises

Through discussions and consultations with industry experts, scholars, and corporate executives, the importance of evaluation indicators is determined, and factors crucial to the success of enterprise knowledge management are considered as the main indicators. Through this hierarchical and segmented approach, enterprises can more accurately identify their strengths and areas for improvement in knowledge management, and based on this, develop targeted improvement strategies. The index system for assessing the knowledge management capability of higher education training enterprises adopts a three-tier structure, of which the first tier is the target tier, that is, the ultimate purpose of the assessment is to comprehensively assess the knowledge management capability of higher education training enterprises; the second tier is the primary index tier, which defines the knowledge management capability of enterprises from seven levels; the third tier, which is further subdivided from the secondary index tier downwards The third level is the second level indicator layer, which is further subdivided from the second level indicator layer. Finally, the assessment index system of knowledge management capability of higher education training enterprises, which consists of 7 primary indicators and 16 secondary indicators, was formed, and the results are shown in Figure 3.4.

3.4. Determination of the Weight of Knowledge Management Capability Evaluation Indicators for Higher Education and Training Enterprises. In order to determine the weights of each indicator in a more comprehensive, reasonable and effective manner, both qualitative and quantitative approaches were adopted to determine the weights of each indicator in conjunction with the characteristics of the knowledge management capabilities of higher education training enterprises. After an in-depth analysis, the hierarchical analysis method was also used to determine the weights of each indicator for the knowledge management capability of higher education training enterprises. A is the judgment matrix constructed on the basis of the recursive hierarchy constructed. After constructing the judgement matrix, a mathematical process is applied to sort it hierarchically to obtain the relative weights of the level in relation to the previous level [16]. λ_{max} In other words, the maximum characteristic root of the judgement matrix and its corresponding eigenvector W are calculated and then normalized to W. This study utilizes the sum-product method, which is relatively simple to compute, by first regularizing each item of the judgement matrix, with the expression shown in equation 3.1.

$$(\bar{a_{1j}}) = \frac{a_{ij}}{\sum_{k=1}^{n} a_{kj}} \quad \text{for } i,j = 1,2,\ldots,n \tag{3.1}$$

The subsequent rows are summed to obtain the sum vector and the expression is shown in equation 3.2.

$$(\bar{W_1}) = \sum_{j=1}^{n} \bar{a_i}j \quad \text{for } i,j = 1,2,\ldots,n \tag{3.2}$$

The resulting sum vector is regularized to be able to obtain the feature vector, the expression of which is shown in equation 3.3.

$$(\bar{W_1}) = \bar{W_1}/\sum_{j=1}^{n} \bar{W_1} \quad \text{for } i,j = 1,2,\ldots,n \tag{3.3}$$

Finally, the maximum eigenvalue is calculated and the expression is shown in equation 3.4.

$$\lambda_{max} = \sum_{i=1}^{n} \frac{(AW)_i}{nW_i} = \frac{\sum_{i=1}^{n} \frac{(AW)_i}{W_i}}{n} \quad \text{for } i,j = 1,2,\ldots,n \tag{3.4}$$

After that it can be tested for consistency, it is necessary to calculate the Consistency indicators (CI) first, when the numerator is larger, it means that the consistency of the judgment matrix is worse; when CI=0, it means that the judgment matrix has full consistency [17]. The expression of CI is shown in equation 3.5

$$CI = \frac{\lambda_{\max} - n}{n - 1} \tag{3.5}$$

And the corresponding average random consistency index RI can be determined through the index system, which in turn leads to the consistency ratio of the judgment matrix, with the expression shown in equation 3.6.

$$CR = \frac{CI}{RI} \tag{3.6}$$

If the consistency ratio is $CR < 0.1$, it means that the consistency of the judgment matrix is an accepted state; when $CR > 0.1$, it means that the judgment matrix does not meet the requirements of consistency and this judgment matrix needs to be revised again. The total hierarchical ranking refers to the relative weight of each factor in each target level, arranged in a hierarchical order from top to bottom. The relative weight of a tier of indicators to all indicators is its single ranking result, as shown in expression 3.7.

$$W_A = (W_{A1}, W_{A2}, W_{A3}, \ldots, W_{An}) \tag{3.7}$$

The expression for the relative weighting of secondary indicators to primary indicators is shown in equation 3.8.

$$W_{A_j} = (W_{A_j1}, W_{A_j2}, W_{A_j3}, \ldots, W_{A_jn}) \tag{3.8}$$

Combining equation 3.7 and equation 3.8, equation 3.9 can be obtained.

$$W_{A \to A_{ij}} = W_{A \to A_i} * W_{A_i \to A_{ij}} \tag{3.9}$$

Consistency tests for total and single sorting were tested and the results showed that the consistency of the judgement matrix was satisfactory for a consistency ratio of. In the process of knowledge management activities of higher education training enterprises, many factors that are difficult to quantify and the fuzziness of human subjective judgment are involved. The fuzzy comprehensive evaluation method is a comprehensive evaluation method based on fuzzy mathematics, and based on the affiliation theory of fuzzy mathematics, it can achieve the purpose of transforming qualitative evaluation into quantitative evaluation, which can well solve the fuzzy and difficult to quantify difficulties in the current evaluation of the enterprise's knowledge management capability [18]. Firstly, the set of indicators needs to be determined, and the expression is shown in equation 3.10.

$$A = \{A_1, A_2, A_3, A_4, A_5, A_6, A_7\} \tag{3.10}$$

In equation 3.10, A denotes the first level of the knowledge management capability evaluation index system of higher education training enterprises, which is also the target level. Meanwhile, the study divided the evaluation levels in the model into five levels, namely: excellent, good, fair, poor and poor, and the expressions are shown in equation 3.11.

$$V = \{V_1, V_2, V_3, V_4, V_5\} \tag{3.11}$$

In equation 3.11, V indicates the evaluation level, V_1, V_2 , V_3, V_4 and V_5 indicate the excellent, good, fair, poor and poor levels of the rating respectively. According to determine the number of people who belong to a certain level of an indicator, the proportion of the total number of participants in the questionnaire r_{ij} , and finally get the vector of affiliation value of the indicator, the calculation formula is shown in equation 3.12.

$$r_{ij} = \frac{m_{ij}}{m} \tag{3.12}$$

In equation 3.12, m_{ij} represents the number of people who classified the indicator as level and is used to describe the total number of participants in the questionnaire. The single-factor judgement yields the affiliation vector $r_i = (r_{i1}, r_{i2}), r_{i3}, r_{i4}, r_{i5}$, which in turn enables the affiliation matrix to be obtained, the expression of which is shown in equation 3.13.

$$R = \begin{bmatrix} r_{11} & r_{12} & r_{13} & r_{14} & r_{15} \\ r_{21} & r_{22} & r_{23} & r_{24} & r_{25} \\ \vdots & \vdots & \vdots & \vdots & \vdots \\ r_{n1} & r_{n2} & r_{n3} & r_{n4} & r_{n5} \end{bmatrix} \tag{3.13}$$

Table 4.1: System parameter

Number	Project	Size	Unit
(1)	Operating system	UNIX	/
(2)	Programming tools	Python	/
(3)	Working voltage	220	V
(4)	Memory	1020	Mb

After calculating the set of weights and the affiliation matrix of the indicator system, the comprehensive judgment vector is solved and the expression is shown in equation 3.14.

$$B = W \cdot R = (b_1, b_2, \ldots, b_5) \tag{3.14}$$

In equation3.14, $b_1, b_2, \ldots, b_5$ indicates the comprehensive evaluation results of the evaluation indicators, reflecting the subordination relationship between the comprehensive evaluation indicators of each level and each tier. The comprehensive evaluation is then carried out in accordance with the principle of maximum affiliation, and the conclusion of the comprehensive evaluation is obtained.

If the weight of the model changes, it may significantly affect the evaluation results and final decision, and sensitivity analysis is required. Conducting sensitivity analysis is an important step in evaluating the effectiveness and reliability of a model. To ensure the reliability and applicability of the model, it is recommended to conduct sensitivity analysis by adjusting different weight combinations and observing changes in the results after developing the initial model. This can ensure that the adopted model can still function even in different contexts and make wise adjustments and decisions.
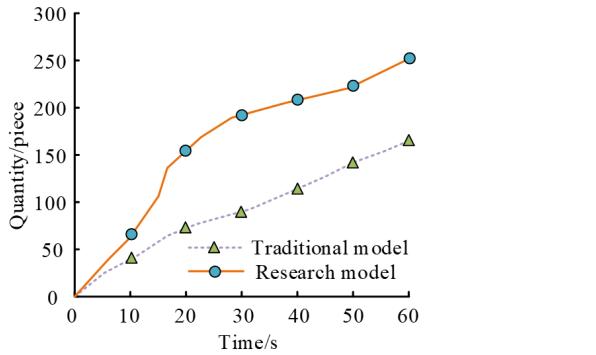
The steps of sensitivity analysis are as follows: determining variables, adjusting variables, observing results, analyzing trends in changes, and explaining and applying them. Firstly, identify the key variables in the model that may affect the results, such as the weights of each evaluation indicator. Systematically changing the values of these key variables (weights) can be a single variable change or adjusting multiple variables simultaneously. Record the impact of these adjustments on the final evaluation results, such as the ranking or score of the company's knowledge management capabilities. Analyze the trend of changes in the results with key variables and understand which variables have the greatest impact on the results. Based on the results of sensitivity analysis, explain and make necessary adjustments to the model or evaluation system.

4. Higher Education Training Enterprise Knowledge Management Capability Evaluation Model and Capability Analysis.
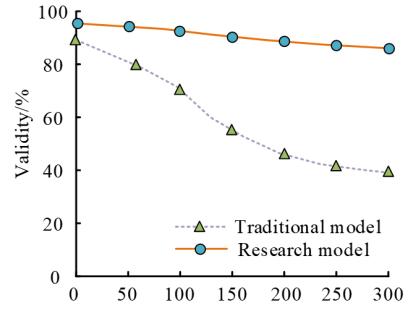
4.1. Analysis of a model for integrating knowledge management and competitive intelligence in higher education training enterprises. A knowledge management model for higher education training enterprises incorporating shadow teams was analyzed and compared with a traditional knowledge management model to verify the validity of the model constructed by the study. The two models were conducted under the same experimental conditions and with the same parameter settings in the experiments, where the parameters of the models are shown in Table 4.1.

According to the competitive intelligence needs of higher education training enterprises, plan their competitive intelligence objectives and implementation priorities, and determine the direction and scope of intelligence collection, and compare the intelligence information collection and competitive intelligence analysis results of the two models, the results are shown in Figure 4.1.

As can be seen from Figure 4.1, the number of intelligence information collected by the two models increases as time increases, but the number of intelligence information collected by the model constructed by the research method is significantly more than that of the traditional model; at 60s, the number of intelligence information collected by the two models is 253 and 164 respectively. In the competitive intelligence analysis, the effectiveness of the analysis decreases as the number of intelligence increases, but the rate of decline of the model constructed by the research method is significantly lower than that of the traditional model; when the intelligence information is 300, the effectiveness of the analysis of the two models is 87.2% and 39.5%
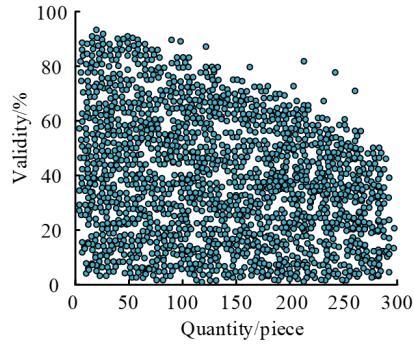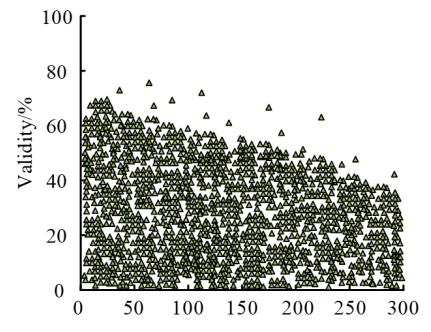
(a) Intelligence Information Collection

(b) Competitive Intelligence Analysis

Fig. 4.1: Intelligence information collection and competitive intelligence analysis results of two models

(a) Research Model

(b) Traditional Model

Fig. 4.2: Two Models for Analyzing Valuable Intelligence Information Results

respectively. The effectiveness of competitive intelligence utilisation is compared and analysed through the competitive intelligence evaluation and feedback mechanism in the knowledge management and competitive intelligence integration model of knowledge higher education training enterprises. Firstly, the results of the two models' analysis of tacit knowledge are shown in Figure 4.2.

Figures 4.2a and 4.2b show the analysis of tacit knowledge by the model constructed by the research and the traditional model respectively. It can be seen from Figure 6 that the model constructed by the research method has a significantly better efficiency profile for the analysis of tacit knowledge than the traditional model. The two models were then analyzed for valuable intelligence information and the results are shown in Figure 4.3.

Figure 4.3a and Figure 4.3bshow the analysis of valuable intelligence information by the model constructed by the research and the traditional model respectively. It can be seen from Figure 7 that the efficiency of the models constructed by the research method for the analysis of valuable intelligence information is also significantly better than that of the traditional models, and the efficiency of the two models for the analysis of valuable intelligence information is better than that of the analysis of tacit knowledge.

4.2. Empirical analysis of knowledge management capabilities of higher education training enterprises. Taking an examination and research institution as an example, an empirical analysis was conducted on its knowledge management capability. The information on the assessment of the knowledge management

(a) Research Model

(b) Traditional Model

Fig. 4.3: Two Models for Analyzing Valuable Intelligence Information Results

Table 4.2: Evaluation Index System for Knowledge Management Ability of Education and Training Institutions

Target layer	Primary indicator	Secondary indicators	Weight of each indicator relative to the target layer
Evaluation of Knowledge Management Ability of Postgraduate Examination Institutions	A1	A11	0.0557
		A12	0.0186
	A2	A21	0.1367
		A22	0.0273
	A3	A31	0.2321
		A32	0.0774
	A4	A33	0.0774
		A41	0.1757
		A42	0.0586
	A5	A51	0.0052
		A52	0.0171
		A53	0.0094
	A6	A61	0.0143
		A62	0.0429
	A7	A71	0.0431
		A72	0.0086

capability of the examination and research institution was obtained by means of visits and surveys; at the same time, the fuzzy comprehensive evaluation data was obtained from the questionnaire of the staff of the institution, and the questions contained in the questionnaire were all from the 16 secondary indicators of the evaluation index system. To ensure the validity and feasibility of the questionnaire, it was randomly distributed to the staff of the five functional units of the organization, with a representative number of employees in each area and with a certain understanding of the overall situation of the company. The results of the determination of the indicator system weights are shown in Table 4.2.

Combining the constructed evaluation model of knowledge management capability of higher education training and the determined weights of the evaluation index system of the examination and research institutions, the fuzzy comprehensive evaluation method was used in order to verify the validity of the evaluation model of knowledge management capability of higher education training enterprises. On this basis, the affiliation matrix of each indicator was constructed based on the 30-questionnaire data, combined with the indicator weights determined in the previous section, and the results are shown in Table 4.3.

From this, we can obtain the affiliation matrix, which can then be evaluated to obtain the knowledge

Table 4.3: Membership degree of each indicator of knowledge management ability of postgraduate entrance examination institutions

Primary indicator	Secondary indicators	Weight	Fuzzy evaluation of indicators				
			Excellent	Good	Common	Range	Bad
A1	A11	0.0557	0.37	0.43	0.17	0.03	0.00
	A12	0.0186	0.23	0.30	0.37	0.10	0.00
A2		0.1367	0.30	0.43	0.17	0.07	0.03
	A22	0.0273	0.07	0.40	0.40	0.10	0.03
A3		0.2321	0.07	0.30	0.53	0.10	0.00
	A32	0.0774	0.07	0.63	0.30	0.00	0.00
A4		0.0774	0.07	0.67	0.27	0.00	0.00
		0.1757	0.03	0.43	0.40	0.07	0.07
	A42	0.0586	0.00	0.00	0.23	0.67	0.10
A5		0.0052	0.00	0.10	0.43	0.37	0.10
		0.0171	0.20	0.30	0.43	0.07	0.00
	A53	0.0094	0.10	0.23	0.47	0.17	0.03
A6		0.0143	0.20	0.43	0.30	0.07	0.00
	A62	0.0429	0.03	0.50	0.43	0.03	0.00
A7		0.0431	0.17	0.40	0.37	0.07	0.00
	A72	0.0086	0.40	0.43	0.17	0.00	0.00

acquisition ability, knowledge diffusion ability and the fuzzy evaluation vector of the examination and research institution. Finally, according to the principle of maximum affiliation, it can be seen that the knowledge management ability of this education and training institution belongs to the five grades of "good", which means that the knowledge management ability of this examination and research training institution is in the middle to upper level. Forty students with the intention of taking the examinations and with an average score of 80±5 in the final examinations at the top and bottom of their junior year were selected and divided into two groups, one group participating in the training of the examination institution and one group studying on their own, and their examination results were compared to verify the knowledge management ability of the training institution. The results are shown in Figure 4.4.

In Figure 4.4, the test scores have been standardized by converting all scores to a total of 100. Figure 4.4 shows that the results of the students who participated in the training were, for the most part, significantly higher than those of the untrained students. This indicates that the institution has good knowledge management skills and has good first-hand knowledge to provide students with more informative training to help them achieve better exam results. To further evaluate the institution, the participating students were asked to rate the knowledge management capabilities of the institution and the results are shown in Figure 4.5.

As can be seen in Figure 4.5, the students who participated in the training all rated the knowledge management competencies of this examiner higher, with all rating values above 4.2. This further indicates that the higher education knowledge management model incorporating the shadow team has better capabilities and in doing so can enhance its own competitiveness.

5. Conclusion. With the development of our society, knowledge is becoming increasingly important, and the importance of knowledge makes it increasingly important for enterprises to carry out knowledge management. Shadow teams can effectively integrate knowledge management with competitive intelligence, enhancing the core competitiveness of enterprises. The education and training industry, as a typical modern knowledge intensive industry, needs to strengthen its own knowledge management and enhance its competitiveness. In order to enhance the knowledge management capabilities and competitiveness of higher education knowledge management institutions, this study integrates the advantages of shadow teams, constructs a knowledge management model for higher education training enterprises, and evaluates their knowledge management capabilities. The results show that the overall performance of the knowledge management model for higher education training enterprises integrating shadow teams is superior to traditional knowledge management models, and the effec-

(a) Politics

(b) English

(c) Professional Course 1
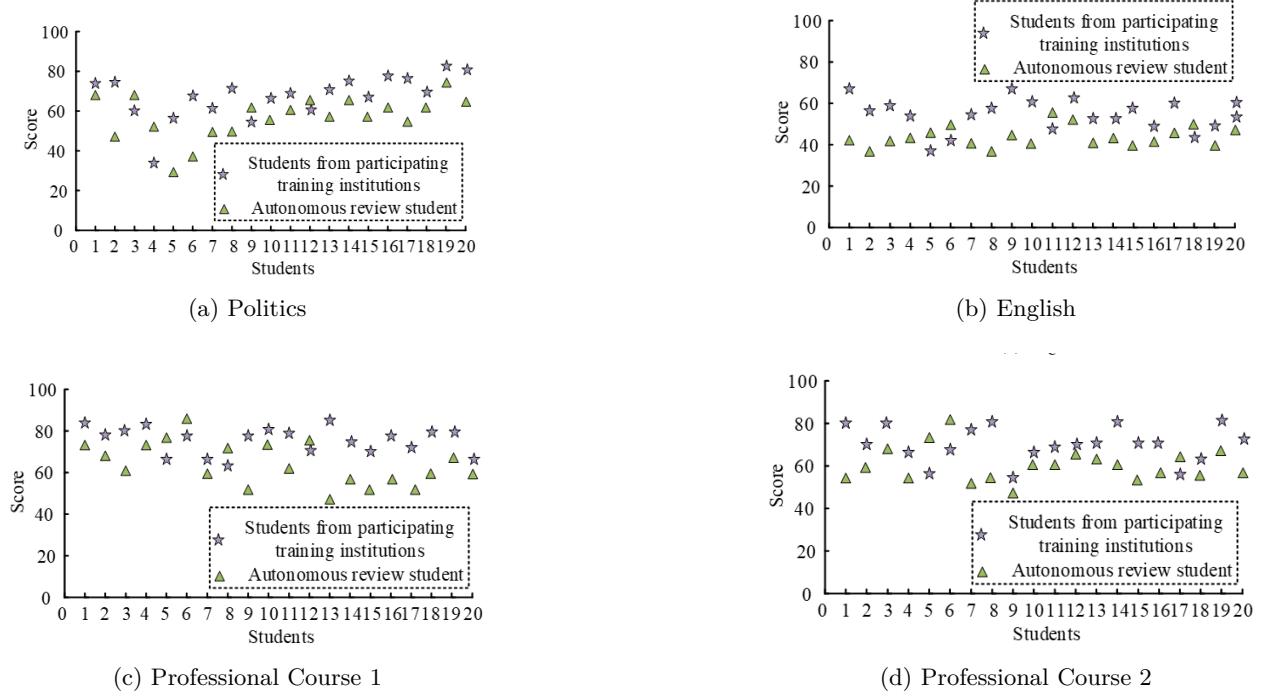
(d) Professional Course 2
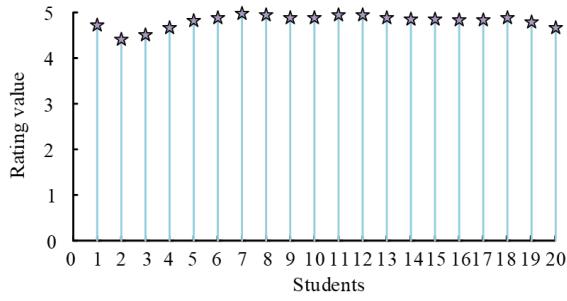
Fig. 4.4: Main Figure

Fig. 4.5: Students' evaluation of knowledge management ability of postgraduate entrance examination institutions

tiveness of the analysis of the two models is 87.2% and 39.5% respectively when the intelligence information is 300 pieces. The former is significantly more efficient in analyzing valuable intelligence information than traditional models, and both models are more efficient in analyzing valuable intelligence information than in analyzing implicit knowledge. The students who participated in the training rated the knowledge management ability of the postgraduate entrance examination institution relatively high, with scores higher than 4.2 points. Further illustrate that the higher education knowledge management model that integrates shadow teams has better capabilities and can enhance its competitiveness. The uniqueness of this study lies in the integration of shadow teams into the process of constructing knowledge management models for higher education and training

enterprises. There are still some shortcomings in this study, such as the incomplete indicator system. In the future, we will enrich and improve the evaluation index system based on the development of the industry, and construct a comprehensive and scientific evaluation index system.

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