Digital Empowerment for the Innovation and Empirical Analysis of Ideological and Political Management Models in Universities

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ABSTRACT Ideological and political (IP) management in universities serves as the core work to fulfill the fundamental task of fostering virtue through education. The traditional IP management model is plagued by practical drawbacks including low communication efficiency, fragmented data, insufficient targeted education and weak whole-process supervision. The popularization of digital technologies has provided new tools for the transformation of university IP work, with big data, smart platforms and online interactive systems gradually being integrated into the entire routine of IP management. Taking digital empowerment as the starting point, this paper sorts out the existing problems of current university IP management in China, constructs an innovative operational framework for digital-based IP management, and conducts empirical verification through questionnaires and institutional operational data. Five sets of statistical tables are adopted to quantitatively analyze the internal correlations among the application of digital tools, optimization of management processes and educational outcomes. The research finds that regular use of digital platforms, cross-departmental data sharing mechanisms and hierarchical targeted IP content push can significantly improve IP management efficiency and students' recognition of ideological education. Nevertheless, most universities are confronted with three prominent obstacles: idle digital equipment, insufficient digital operation capabilities of IP staff, and imperfect data security management systems. Based on the empirical results, this paper proposes implementable optimization strategies from five dimensions including platform construction, talent training, system improvement, targeted education and resource integration. It provides practical references for the digital transformation of IP management in regular undergraduate colleges and vocational colleges.

INDEX TERMS Digitalization, University ideological and political management, Model innovation, Fostering virtue through education, Empirical analysis

I. INTRODUCTION

A. RESEARCH BACKGROUND

Fostering virtue through education is the fundamental goal of higher education in China[1]. University IP management undertakes multiple functions: guiding college students to establish correct outlooks on the world, life and values, regulating daily ideological education, resolving students' mental and ideological conflicts, and implementing ideological work[2]. Over the past decade, mobile internet, big data, artificial intelligence and smart campus systems have developed rapidly, and college students have fully shifted their channels for learning, socializing and acquiring information to online platforms[3,4]. The traditional IP work model relying on offline class meetings, face-to-face talks, paper-based account registration and separate departmental management can no longer adapt to contemporary students' behavioral patterns[5,6]. The traditional IP management has obvious limitations. First,

information transmission is delayed, making it difficult for counselors and IP teachers to keep abreast of all students' ideological dynamics in a timely manner[7]. Second, management data is fragmented[8]. Students' academic performance, mental status, rewards and punishments, club activities and online remarks are managed separately by the Academic Affairs Office, Student Affairs Office, Psychological Counseling Center and Cyberspace Affairs Office. Without a unified data port, IP managers cannot build comprehensive student profiles. Third, educational methods are homogeneous[7]. Uniform IP courseware and activities are applied to all students, lacking hierarchical guidance for introverted students, students in need and active online users. Fourth, work assessment relies on paper documents[9]. The

whole process of IP management is hard to be recorded, and educational outcomes can only be evaluated subjectively at the end of each semester without quantitative evidence. Digital tools can address the above management difficulties[10,11]. A number of universities across the

country have successively built smart IP platforms, online IP classrooms and digital student growth archive systems[12]. These tools record students' ideological behaviors with data and automatically push tailored IP educational content, enabling integrated online and offline ideological guidance. However, the digital construction of IP work in most universities only stays at the stage of hardware procurement, without supporting improved management models, resulting in low utilization of digital resources[13]. Against this backdrop, researching how digital technologies restructure IP management processes, establish new management models and verify the empowering effects with empirical data bears both theoretical value and practical significance.

B. RESEARCH SIGNIFICANCE

1) Theoretical Significance

Existing studies on university IP work mainly focus on digital IP classroom teaching and online IP content creation. Systematic research targeting the digital model of IP management is relatively scarce, and most existing literature only conducts theoretical deduction without empirical analysis supported by questionnaires and institutional operational data. This paper constructs a complete operational system for digital IP management, quantitatively examines the impact of digital factors on management outcomes, enriches empirical research achievements in the field of digital IP management, improves the theoretical framework for the modernization of university IP management, and provides analytical ideas and measurement references for subsequent similar academic studies.

2) Practical Significance

The empirical data of this research is collected from frontline IP managers and students in multiple local undergraduate colleges and vocational colleges, so the research conclusions are in line with the real scenarios of grassroots IP work. This paper summarizes common problems in digital management and puts forward hierarchical, low-cost and implementable innovative management schemes. Student affairs departments, IP teaching and research sections and university administrators can directly refer to the statistical data and optimization paths in this paper to adjust the operation of local smart IP platforms, improve digital skill training systems for IP staff, and establish a unified data management mechanism for students' ideological information, so as to effectively enhance the refinement and precision of IP management.

C. RESEARCH STATUS

Domestic scholars have conducted research on digital ideological and political work mainly since 2018. Some scholars focus on the integration of digital technologies and IP educational content, and propose communication paths for IP education via short videos, official accounts and live

streaming[14]. Others discuss the auxiliary role of smart campus platforms in student management[15]. Current literature has two major deficiencies: first, most studies fail to distinguish between IP teaching and IP management, focusing excessively on classroom teaching while ignoring daily work such as student ideological supervision, account management, risk early warning and staff assessment. Second, empirical research suffers from single sample sources — most studies only conduct surveys in a single university, leading to insufficient data representativeness and a lack of multi-dimensional comparative statistical tables.

D. RESEARCH CONTENTS AND METHODS

1) Research Content

This paper consists of six main parts:

1.Introduction: elaborating the research background, significance, deficiencies of existing studies and research ideas.

2.Definition of core concepts and analysis of the defects of the traditional university IP management model.

3.Construction of the overall framework for the innovative IP management model empowered by digital technologies, including five subsystems: platform, data, personnel, system and education.

4.Empirical research design: introducing questionnaire samples and variable settings, and conducting descriptive statistics, correlation analysis, regression analysis, problem statistics and hierarchical comparison based on five tables.

5.Analysis of major obstacles and internal causes of digital IP management based on statistical data. Proposing targeted strategies for the implementation of the innovative digital IP management model on the basis of empirical conclusions, followed by a summary of the full text, research limitations and future research directions.

2) Research Methods

1.Literature Research Method: Sort out journal papers and educational policy documents related to digital ideological and political work, university student management and smart campuses published in the past five years, summarize core theoretical viewpoints, identify research gaps and determine the research orientation of this paper.

2.Questionnaire Survey Method: Distribute two types of questionnaires to IP managers and students in 6 local undergraduate colleges and 3 vocational colleges. Collate valid sample data and conduct quantitative analysis with statistical tables.

3.Empirical Analysis Method: Set explanatory variables, explained variables and control variables. Verify the internal relationship between the level of digital construction and IP management outcomes through correlation and regression

analysis, and support arguments with data instead of pure theoretical discussion.

4.Comparative Analysis Method: Compare key indicators of IP management among universities with high, medium and low levels of digital construction, and visually demonstrate the actual gaps brought by digital empowerment.

E. RESEARCH INNOVATIONS

1.Innovative Research Perspective: Different from most studies focusing on IP classroom teaching, this paper conducts research on digital empowerment covering the whole process of IP management, including account management, risk early warning, performance assessment, team management and targeted education.

2.Innovative Research Method: Five standardized statistical tables based on first-hand field survey data are adopted for empirical testing to quantify the influence of various digital factors, ensuring all conclusions are data-supported. Innovative Practical Path: Instead of copying the high-cost digital construction schemes of top-tier universities, this paper designs hierarchical and low-cost digital management innovation schemes considering the resource differences between regular undergraduate colleges and vocational colleges, which are applicable to most local universities.

II. DEFINITION OF CORE CONCEPTS

A. DIGITAL EMPOWERMENT

Digital empowerment refers to relying on digital tools such as big data, online platforms, intelligent terminals and data storage systems to restructure original work processes, reduce labor costs, explore the intrinsic value of data and improve overall work quality. In the context of this paper, digital empowerment specifically means the intervention of digital technologies in university IP management. It breaks down cross-departmental data barriers, simplifies administrative work for IP staff, automatically identifies students' ideological risks, and realizes targeted ideological guidance. Digital empowerment is not merely purchasing hardware or building websites, but transforming the original management logic, systems and working modes with digital tools.

B. UNIVERSITY IDEOLOGICAL AND POLITICAL MANAGEMENT

University IP management is different from IP classroom teaching. IP teaching focuses on imparting theoretical knowledge in class, while IP management is a full-process and all-staff management work. It covers counselors' daily ideological guidance, investigation of students' ideological dynamics, prevention and control of ideological risks, filing of IP work records, performance appraisal of IP teachers, assistance to students in need, overall planning of campus ideological and cultural activities, online public opinion control and all other administrative and educational management work throughout students' campus life.

C. INNOVATION OF IDEOLOGICAL AND POLITICAL MANAGEMENT MODEL

The traditional IP management model centers on offline manual operation, featuring scattered processes, isolated information and ambiguous standards. Model innovation means building a complete new work system based on digital tools, including a unified smart IP management platform, cross-departmental data sharing systems, integrated online-offline educational processes, and supporting new mechanisms for assessment, training and risk early warning, so as to form a stable, replicable and efficient new operational system for IP management.

III. CONSTRUCTION OF THE OVERALL FRAMEWORK FOR THE INNOVATIVE IP MANAGEMENT MODEL EMPOWERED BY DIGITALIZATION

The new digital IP management model takes the integrated smart IP platform as the hardware carrier, cross-departmental data sharing as the basic condition, hierarchical targeted education as the core goal, digital management systems as the guarantee, and the digital capabilities of IP staff as the support. The five subsystems cooperate with each other to form a complete closed-loop management system. The whole model is divided into five layers: basic data layer, platform function layer, management execution layer, educational outcome layer and system guarantee layer.

A. BASIC DATA LAYER: UNIFIED COMPREHENSIVE DATABASE FOR STUDENTS' IDEOLOGICAL INFORMATION

The basic database is the foundation of the new model. Universities connect the system interfaces of the Academic Affairs Office, Student Affairs Office, Psychological Counseling Center, Cyberspace Affairs Office, Financial Aid Office and Security Office to establish a unified digital student archive. The archive contains five categories of fixed data:

1.Academic data: records of failed courses, attendance, rewards and punishments.

2.Living data: accommodation information, applications for financial aid and certification materials for students with financial difficulties.

3.Mental health data: psychological counseling reservations, psychological assessment scores and crisis intervention records.

4.Network data: posts on campus forums, browsing records of online IP platforms and interaction records on short video platforms.

5.IP management data: records of heart-to-heart talks, participation in class meetings, ideological reports, club activities and volunteer service hours. All data are automatically synchronized to the smart IP platform to generate exclusive ideological profiles for each student. Managers can access all information with one click without repeated cross-departmental communication.

B. PLATFORM FUNCTION LAYER: FIVE CORE MODULES OF THE SMART IP MANAGEMENT PLATFORM

The unified platform is equipped with five functional modules covering all IP management work, replacing the original manual paper-based processes.

1.Automatic daily account management module: The system is embedded with standardized electronic forms. Students can submit ideological reports, activity applications and hardship applications online. Data is automatically classified and archived, and weekly, monthly and semester summary reports are generated automatically. Counselors are freed from manual statistics and paper filing, and all work records are permanently stored in the system.

2.Intelligent ideological risk early warning module: The platform is set with risk identification indicators. When a student has multiple abnormal performances such as consecutive course failures, frequent psychological counseling, posting extreme negative remarks online or long-term absence from group activities, the system automatically sends early warnings to corresponding counselors and college leaders to enable advance intervention and pre-risk prevention.

3.Hierarchical targeted IP content push module: The system classifies students automatically based on their profiles into five groups: students with academic difficulties, mentally sensitive students, active online users, outstanding students and students with financial difficulties. Corresponding tailored IP articles, online courses and online talk invitations are pushed to realize personalized and targeted management.

4.Online interactive education module: Equipped with anonymous talk channels, live IP classrooms and online discussion areas. Students can share their ideological puzzles at any time, while IP teachers and counselors provide online counseling on a regular basis, breaking the time and space limitations of offline communication.

5.Digital assessment and evaluation module: The platform automatically extracts quantitative indicators such as counselors' talk frequency, number of risk interventions, completion rate of students' IP courses and records of conflict resolution. Monthly and annual work scores are generated automatically, reducing the weight of paper documents and realizing objective assessment based on real educational data.

C. MANAGEMENT EXECUTION LAYER: NEW INTEGRATED ONLINE-OFFLINE MANAGEMENT PROCESS

The new model abandons the single offline working mode and establishes a closed-loop process: online investigation and pre-judgment →offline targeted intervention →online follow-up and feedback.

1.The platform updates student data daily, screens potential ideological risks and generates early warning lists.

2.Counselors conduct one-on-one talks and themed class meetings offline with reference to online student profiles.

3.Record offline communication content and assistance measures in the platform, continuously track students' subsequent online behaviors and changes in psychological assessment, and document improvement status. Adjust pushed IP content according to changes in students' status to implement dynamic continuous management and avoid one-off education.

D. EDUCATIONAL OUTCOME LAYER: DIGITAL QUANTITATIVE OUTCOME FEEDBACK SYSTEM

The platform automatically collects two types of outcome data:

1.Student-oriented data: completion rate of IP courses, scores of ideological cognition assessment, reduction of negative emotions and incidence of disciplinary violations.

2.Management-oriented data: number of risks resolved in advance, time saved on account management, duration of cross-departmental communication and number of students taking the initiative to consult. All data are summarized monthly to intuitively reflect the actual outcomes of IP management in each college and by each counselor, providing data support for management optimization.

E. SYSTEM GUARANTEE LAYER: SUPPORTING MANAGEMENT SYSTEMS FOR DIGITALIZATION

The stable operation of the digital model relies on supporting systems, including four core rules and regulations:

1.Cross-departmental data sharing management system: clarifying the data synchronization frequency, open standards and access permissions of each department, and protecting students' privacy.

2.Regular digital skill training system for IP managers.

3.Student digital information security management system: standardizing the storage, access and confidentiality of platform data. Digital IP work assessment system: defining the weight standards of platform data in annual performance appraisal.

IV. EMPIRICAL ANALYSIS OF DIGITAL EMPOWERMENT FOR UNIVERSITY IP MANAGEMENT

A. EMPIRICAL RESEARCH DESIGN

1) Research Hypotheses

Combined with the above theoretical framework, three research hypotheses are proposed:

H1: The higher the frequency of using digital IP platforms in universities, the higher the overall efficiency of IP management.

H2: The completeness of cross-departmental data sharing mechanisms is positively correlated with the effectiveness of student ideological guidance.

H3: The stronger the digital operation capabilities of IP managers, the more prominent the practical effect of digital empowerment on IP management.

2) Sample Selection and Questionnaire Distribution

The survey was conducted in 9 universities, including 6 local undergraduate colleges and 3 public vocational colleges. Two independent questionnaires were distributed: Questionnaire on Digital IP Management for University IP Managers and Questionnaire on Students' Perception of Digital IP Education. Questionnaires were distributed both online and offline from November to December 2025. A total of 320 questionnaires were distributed to IP managers (staff of student affairs departments, college counselors and full-time IP teachers), and 296 valid responses were collected, with an effective response rate of 92.5%. 1,600 questionnaires were distributed to full-time undergraduates and vocational students from freshmen to seniors, and 1,472 valid responses were collected, with an effective response rate of 92%. All scales adopted the 5-point Likert scoring method: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree.

3) Variable Definition

1.Explanatory variable (digital empowerment level): divided into three sub-dimensions: platform usage frequency, completeness of data sharing, and digital capabilities of managers.

2.Explained variable (IP management outcome): including management efficiency indicators and student education effectiveness indicators. Control variable: university type (undergraduate / vocational college), capital investment in digital construction, and working years of managers.

B. CONSTRUCTION OF KNOWLEDGE GRAPH FOR METROLOGY BASE PLATFORM

1) Statistical Analysis of Empirical Data

Table 1 presents the basic distribution of administrator and student samples, clearly illustrating the sample structure and ensuring the representativeness of survey data.

TABLE 1. Descriptive statistics of basic information of survey samples

Sample Category	Classification Indicator	Group	Sample Size	Proportion (%)
IP Managers (296 persons)	University Type	Undergraduate College	191	64.53
		Vocational College	105	35.47
	Working Years	Less than 3 years	87	29.39
		3–8 years	134	45.27
		More than 8 years	75	25.34
	Annual Digital Training Times	0 time	94	31.76
		1 time	142	47.97
		2 times and above	60	20.27
Students (1472 persons)	Education Level	Undergraduate	965	65.56
		Vocational	507	34.44
	Grade	Freshman	412	28.00
		Sophomore	397	26.97
		Junior	425	28.87
		Senior	238	16.17
	Usage Frequency of Smart IP Platform	Hardly used	486	33.02
		1–3 times per month	671	45.58
		4 times or more per week	315	21.40

Key findings:

1.Nearly one-third of IP managers received no digital skill training throughout the year, lacking channels to improve digital capabilities.

2.33.02% of students hardly use the campus smart IP platform, resulting in low activity of the student-side platform.

3.Samples from vocational colleges account for about 35% of both managers and students, covering two types of universities and ensuring the wide applicability of research conclusions.

Table 2 examines the correlation between explanatory variables and explained variables, and verifies whether the three basic hypotheses are preliminarily supported by data.

TABLE 2. Descriptive Statistics of Basic Information of Survey Samples

Variable	Platform Usage Frequency	Completeness of Data Sharing	Managers' Digital Capabilities	Management Efficiency	Student Education Effect
Platform Usage Frequency	1	—	—	0.642**	0.587**
Completeness of Data Sharing	0.591**	1	—	0.685**	0.713**
Managers' Digital Capabilities	0.536**	0.604**	1	0.619**	0.662**
Management Efficiency	0.642**	0.685**	0.619**	1	0.746**
Student Education Effect	0.587**	0.713**	0.662**	0.746**	1

Note:** indicates significant correlation at the 0.01 level.

Key findings:

1.The three digital dimensions are all significantly and positively correlated with management efficiency and student education effect, which preliminarily verifies Hypotheses H1, H2 and H3.

2.The correlation coefficient between data sharing completeness and student education effect reaches 0.713, the highest among all indicators. It proves that breaking cross-departmental data barriers and establishing unified student archives play the most important role in improving IP education quality. Digital construction should not be limited to building online platforms, and data sharing mechanisms are the core.

The correlation coefficient between management efficiency and student education effect is 0.746. After digitalization streamlines management processes, counselors are relieved from trivial administrative work and can devote more energy to targeted ideological guidance, so the improvement of management efficiency directly promotes education quality. Table 3 takes the three dimensions of digitalization as independent variables and conducts regressions with management efficiency and education effectiveness as dependent variables respectively, so as to quantify the impact weight of each dimension.

TABLE 3. Multiple linear regression results of digital empowerment on IP management outcomes

Explained Variable	Independent Variable	Regression Coefficient β	T Value	P Value	VIF	Adjusted R^2
IP Management Efficiency	Platform Usage Frequency	0.227	6.314	0.000	1.426	0.572
	Completeness of Data Sharing	0.341	8.729	0.000	1.513	
	Managers' Digital Capabilities	0.204	5.107	0.000	1.389	
Student Education Effect	Platform Usage Frequency	0.185	4.862	0.000	1.426	0.615
	Completeness of Data Sharing	0.386	9.541	0.000	1.513	
	Managers' Digital Capabilities	0.263	6.735	0.000	1.389	

Key findings: All P values are less than 0.01, indicating statistically significant regression results. All VIF values are below 2, meaning no multicollinearity and stable model. The regression coefficient of data sharing completeness is the largest for both explained variables. In terms of improving student education effect, its coefficient is 0.386, far higher than the other two indicators. This explains why many universities fail to achieve ideal digital empowerment even after building online platforms: without connected data interfaces, platforms can only realize basic check-in and online courses functions, and cannot generate comprehensive student ideological profiles.

Managers' digital capabilities rank second in regression coefficients. It means that after the construction of hardware platforms, regular digital training is indispensable. If staff cannot operate data screening, risk early warning and targeted push functions, digital platforms will be left idle.

Table 4 summarizes the obstacles to digital construction reflected in questionnaires filled out by administrators, quantifies the severity of various problems, and identifies the core contradictions existing in model innovation.

TABLE 4. Statistical proportion of existing problems in digital IP management

Existing Problems	Number of Respondents	Proportion among All Managers (%)	Problem Level	Existing Problems	Number of Respondents
Disconnected cross-departmental data and delayed platform data update	227	76.69	Primary Core Problem	Disconnected cross-departmental data and delayed platform data update	227
Lack of systematic digital skill training for IP staff	205	69.26	Primary Core Problem	Lack of systematic digital skill training for IP staff	205
Single platform functions and lack of risk early warning module	163	55.07	Secondary Problem	Single platform functions and lack of risk early warning module	163
Insufficient capital investment in digital construction	131	44.26	Secondary Problem	Insufficient capital investment in digital construction	131
Low student initiative in using platforms and poor participation in online education	124	41.89	Secondary Problem	Low student initiative in using platforms and poor participation in online education	124

Key findings: More than 75% of managers regard cross-departmental data barriers as the biggest obstacle, and nearly 70% report the lack of digital training. These two are the two core problems restricting the implementation of digital models. Universities should give priority to solving data sharing and staff training problems, and then gradually optimize platform functions and incentive systems.

Table 5 divides the surveyed institutions into low, medium and high groups according to the degree of digital maturity, compares the gaps in key management indicators, and intuitively reflects the practical effects of digital empowerment.

TABLE 5. Comparison of IP management outcomes among universities with different digital construction levels

Digital Construction Level	Number of Universities	Average Monthly Number of Ideological Risks Resolved in Advance (per university)	Daily Working Hours of Counselors on Paper Accounts (hours)	Completion Rate of Voluntary IP Learning by Students (%)	Year-on-Year Decrease of Student Disciplinary Violations (%)
Low-level (only basic online check-in, no data sharing)	4	2.17	3.26	26.31	4.12
Medium-level (complete platform, partial cross-departmental data sharing)	3	7.64	1.43	51.78	10.67
High-level (full cross-departmental data connection, supporting training and assessment systems)	2	14.39	0.51	78.45	18.94

Key findings:

1.Universities with high-level digital construction resolve more than 6 times as many potential risks in advance as low-level ones, with greatly enhanced pre-risk prevention capacity.

2.Counselors in low-level universities spend 3.26 hours on paper accounts every day, while those in high-level universities only spend 0.51 hours, which proves that digital automatic reports greatly reduce administrative workload.

3.Students' voluntary participation in IP learning rises with the improvement of digital construction, reaching nearly 80% in high-level universities. The decline rate of student disciplinary violations shows obvious hierarchical differences. A sound digital system strengthens ideological guidance and risk control, and effectively reduces students' negative behaviors.

C. COMPREHENSIVE EMPIRICAL CONCLUSIONS

1.The three core digital factors (platform usage, data sharing and staff digital capabilities) all positively improve IP management efficiency and education outcomes, and the three hypotheses are fully verified. Cross-departmental data sharing exerts the strongest influence on education effect and is the core of digital model innovation.

2.The two most prominent pain points in current digital IP construction are disconnected departmental data and insufficient digital training for IP staff, which trouble more than 70% of frontline managers.

3.There are obvious gaps among universities with different digital construction levels. Simple platforms with only basic functions cannot realize effective empowerment. Only a complete system with full data connection, training and assessment can give full play to the value of digital technologies.

The new digital model can significantly cut down counselors' administrative working hours, realize early warning of ideological risks, increase students' participation in IP education, and reduce the occurrence of campus disciplinary violations and mental crises, with quantifiable practical improvement in management outcomes.

V. ANALYSIS OF THE CAUSES FOR OBSTACLES TO THE INNOVATIVE DIGITAL IP MANAGEMENT MODEL

A. CAUSES OF CROSS-DEPARTMENTAL DATA BARRIERS

1.Various departments adopted business systems developed by different vendors at different times, leading to incompatible system interfaces and technical obstacles to automatic data synchronization.

2.Each department has concerns over information management responsibilities, fearing privacy leakage caused by data sharing, so they are reluctant to open data ports subjectively.

3.There is no unified university-level data management system to define data sharing standards, access permissions and responsibilities. Cross-departmental data coordination relies on personal communication rather than institutional constraints, failing to form regular data sharing mechanisms.

B. CAUSES OF INSUFFICIENT DIGITAL CAPABILITIES OF IP MANAGERS

1.Deficient university training plans: Most universities only provide one-time simple operation guidance when platforms are launched, without long-term hierarchical training. Senior counselors lack regular learning channels.

2.Low subjective learning motivation: The traditional assessment system focuses on paper documents, and proficiency in digital platform operation has little impact on annual evaluation, so managers have no incentive to improve digital skills actively.

3.Mismatched training content: Most digital training only teaches general computer operations, without targeted guidance on IP account management, student profile analysis and risk early warning. The training content cannot be applied to daily IP work.

C. CAUSES OF SINGLE PLATFORM FUNCTIONS AND IDLE DIGITAL RESOURCES

1.The mindset of "prioritizing procurement over operation": Universities invest heavily in platform construction but

neglect subsequent function iteration. Platforms only retain basic check-in and online course functions, without developing modules for risk early warning, automatic account management and targeted content push according to actual IP management demands.

2.Platform development teams lack participation from frontline IP staff. Technical personnel are unfamiliar with daily IP management procedures, resulting in impractical and complicated platform functions that discourage long-term use.

3.Deficient operation of the student-side platform: The platform lacks updated interesting IP content, and outdated page design reduces students' willingness to log in and use it.

D. CAUSES OF INSUFFICIENT FUNDS AND INCOMPLETE INCENTIVE SYSTEMS

1.University funds are mainly allocated to teaching equipment and laboratory construction, while the budget for digital IP management is limited. Vocational colleges with tighter funding face greater difficulties in platform upgrading and interface development.

2.The IP work assessment system is rigid. Paper documents and offline activities remain the core evaluation indicators. Digital work achievements account for a low proportion in assessment, so managers lack enthusiasm for platform operation.

3.University leaders have a one-sided understanding of digital transformation, simply believing that purchasing a set of platforms equals digital upgrading. They ignore the importance of supporting systems, personnel training and long-term operation, resulting in inadequate top-level design.

VI. OPTIMIZATION PATHS FOR THE IMPLEMENTATION OF THE INNOVATIVE DIGITAL IP MANAGEMENT MODEL

Based on the problems and causes reflected by empirical data, this section proposes implementable and hierarchical optimization strategies for undergraduate colleges and vocational colleges from five dimensions: data, platform, personnel, system and targeted education.

A. TOP-LEVEL DESIGN: ESTABLISH A UNIVERSITY-LEVEL UNIFIED STUDENT DATA SHARING MECHANISM

1.Issue special university-level data management regulations to clarify the data synchronization cycle, interface standards and access permissions of each department, define information security responsibilities and eliminate concerns about data sharing.

2.Allocate special funds to renovate the interfaces of various business systems and build a university-level unified data middle platform, to realize real-time automatic data synchronization to the smart IP platform and enable counselors to access complete student profiles with one click.

3.Set up a full-time data management position to be responsible for the maintenance, update and confidentiality of student data, and regularly inspect delayed or missing information to ensure the stable operation of the basic database.

B. ITERATE AND UPGRADE THE SMART IP PLATFORM AND IMPROVE CORE FUNCTIONAL MODULES

1.Optimize platform functions based on the demands of frontline counselors, and complete the five core modules: intelligent risk early warning, automatic electronic account management, hierarchical targeted content push, online counseling and digital assessment. Abandon simplified platforms with only check-in and online course functions.

2.Invite counselors and IP teachers to participate in demand discussion during platform development, simplify operation steps to lower the digital operation threshold for staff with weak digital skills.

3.Regularly update IP content on the student-side platform, create educational materials combining short videos, hot topics and real campus cases, and optimize page interaction design to increase student activity.

C. BUILD A HIERARCHICAL AND REGULAR DIGITAL SKILL TRAINING SYSTEM TO IMPROVE THE DIGITAL LITERACY OF IP STAFF

1.Formulate an annual fixed training plan divided into basic courses and advanced data analysis courses. Basic courses cover platform operation and basic data access for all counselors; advanced courses focus on risk indicator analysis, student profile interpretation and targeted IP scheme design for key staff. Organize no less than two centralized training sessions every year, and provide online playback courses for review.

2.Establish an internal sharing mechanism for excellent digital IP work cases, and invite experienced counselors to share practical experience with real cases instead of pure theoretical lectures.

3.Add digital skill assessment after training, and incorporate assessment results into managers' annual comprehensive evaluation to drive active learning.

D. IMPROVE SUPPORTING DIGITAL SYSTEMS AND ESTABLISH A TWO-WAY INCENTIVE AND RESTRAINT MECHANISM

1.Restructure the IP work assessment criteria: increase the weight of quantitative data from smart platforms in annual appraisal, and reduce the score proportion of paper documents and offline activity quantity. Focus on assessing indicators such as risks resolved in advance, online talk frequency and implementation effect of targeted IP work, to change the formalistic evaluation orientation.

2.Issue detailed rules for the protection of students' digital information, standardize the storage, export and use of platform data, restrict unauthorized access to sensitive information such as students' mental status and online remarks,

and conduct regular self-inspections on data security to avoid privacy leakage.

3.Set up special awards for digital IP innovation, and give priority in evaluation and performance rewards to counselors who excel in using digital tools, resolve student ideological risks and create excellent online education cases.

E. INTEGRATE ONLINE AND OFFLINE WORK TO BUILD A CLOSED-LOOP DIGITAL TARGETED IP MANAGEMENT SYSTEM

1.Classify students based on platform profiles, and design differentiated online courses and offline talk plans for different groups (students with academic difficulties, mentally sensitive students, radical online users and outstanding students) to abandon homogeneous education.

2.Implement the fixed process of "online early warning → offline intervention →online follow-up". Counselors shall complete offline communication within 3 working days after receiving risk alerts, record intervention content and track students' status changes on the platform to realize long-term dynamic management. Connect online IP activities with offline campus cultural activities: launch themed discussions and volunteer recruitment online, and organize offline practice activities.

All activity data are automatically synchronized to student digital archives to realize full-process digital management.

F. ALLOCATE FUNDS HIERARCHICALLY TO ADAPT TO THE RESOURCE CONDITIONS OF DIFFERENT UNIVERSITIES

1.Well-funded undergraduate colleges: Fully complete the construction of cross-departmental data middle platforms and full-function platform upgrading, assign full-time operation staff, and allocate special annual funds for the operation of digital IP systems.

2.Fund-constrained vocational colleges: Prioritize connecting the data interfaces of three core departments (Academic Affairs Office, Student Affairs Office and Psychological Counseling Center), and improve basic modules for account management and risk early warning while suspending the development of non-essential functions. Share training resources with local peer colleges to reduce costs and realize basic digital transformation at low cost.

VII. CONCLUSIONS

A. MAIN CONCLUSIONS

This paper constructs the theoretical framework and conducts empirical tests on digital empowerment for the innovation of university IP management models, with quantitative analysis based on five sets of first-hand survey tables. The main conclusions are as follows:

1.The traditional manual IP management model has five major defects: fragmented data, cumbersome processes, homogeneous education, delayed risk control and subjective evaluation, which can no longer meet the requirements of fostering virtue through education in modern universities. Restructuring management models with digital technologies is an inevitable trend.

2.The new digital IP management model consists of five layers: basic data layer, platform function layer, management execution layer, educational outcome layer and system guarantee layer, among which the unified data middle platform is the core foundation.

3.Empirical data prove that platform usage frequency, cross-departmental data sharing and staff digital capabilities can all significantly improve IP management efficiency and education outcomes, and data sharing exerts the greatest influence on education quality.

4.The two core obstacles to current digital IP construction are cross-departmental data barriers and insufficient digital training for IP staff. Other supporting problems include single platform functions, fund shortages and imperfect incentive systems. Universities with different digital construction levels show obvious gaps, and simplified platforms cannot give full play to digital empowerment.

5.To implement the innovative digital management model, universities need to promote work in six aspects synchronously: top-level data systems, platform function iteration, hierarchical digital training, incentive systems,

integrated online-offline targeted education and hierarchical fund allocation, so as to form a complete supporting system and maximize the value of digital technologies..

B. LIMITATIONS

The survey samples of this paper only cover local undergraduate colleges and vocational colleges, excluding top-tier double first-class universities with higher digital construction levels. Thus the conclusions have limited adaptability to top universities. In addition, the questionnaire scales rely on subjective scoring by students and managers, and some indicators cannot obtain complete long-term operational data of universities. Follow-up research can carry out in-depth longitudinal analysis combining multi-year objective operational reports of universities.

C. FUTURE RESEARCH PROSPECTS

1.Expand the sample scope to include double first-class universities and private colleges, and compare the differences of digital IP management models among universities of different levels and types.

2.Adopt time-series data to track changes of IP management indicators in the same university for 3 to 5 years before and after the launch of digital platforms, and conduct longitudinal dynamic empirical analysis. Explore the application of new-generation digital technologies such as large artificial intelligence models in IP management, including AI-based intelligent Q&A and automatic student ideological analysis, to expand the research scope of digital empowerment.

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