

Faculty resource allocation, professional development and performance appraisal management in Chinese university faculty

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Abstract

Teachers in higher education are the guides of talent cultivation, and teachers' professional development contributes to organizational performance as well as faculty satisfaction, which is a key indicator of success or failure in education. This study aimed to explore the resource allocation, professional development and performance appraisal management of university teachers in China. Descriptive statistical analysis, ANOVA, and correlation analysis were conducted using SPSS 25.0 software to explore the impact of faculty resource allocation, professional development, and performance appraisal management on faculty career development in Chinese universities, in an attempt to clarify the direction of faculty career development, focus on improving faculty nurturing ability, and establish a reasonable and effective auxiliary management mechanism through the study. The results show that there is a close relationship between teacher resource allocation, professional development and performance appraisal management in Chinese colleges and universities. The three variables have a positive relationship, which means that good teacher resource allocation will promote the development of professional development; professional development also has a positive driving effect on teacher resource allocation. Meanwhile, the more reasonable performance appraisal management is, the more it promotes professional development, and performance appraisal management indirectly affects teacher resource allocation.

Keywords: teacher resource allocation, professional development, implementation strategies, performance management, teacher career development

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1. Introduction

Since 1999, China's higher education has witnessed the phenomenon of educational expansion, which is mainly reflected in three aspects: scale expansion, structural change and quality level change. Scale expansion mainly refers to the increase in the scale of higher education enrollment in each province; structural change refers to the changes in the hierarchical structure and the disciplinary structure that occurred in the process of expansion (Hu, et. al., 2023); and the increase in per capita education expenditure year by year indicates that the quality level of higher education has been improved year by year, and education funding is the guarantee to improve the quality of higher education and one of the most important indicators to measure the level of investment in higher education (Fang, et. al., 2021). Among them, the improvement of the quality level of education is particularly important. Teachers bear the historical mission of spreading knowledge, ideas and truth, and the important responsibility of the times of shaping souls. Teacher resource allocation, professional development and performance appraisal management are considered to be three important factors to ensure teachers' professional development. In the past, scholars have studied the three variables of teacher resource allocation, professional development and performance appraisal management to some extent, but due to the lack of connection among scholars, the effective connection among the three may be overlooked. In fact, the three variables of teacher resource allocation, professional development and performance appraisal management in colleges and universities are complementary to each other, and an effective understanding of the current situation and development of these three aspects of teachers plays an important role in optimizing the management of teachers' professional development.

Teacher resource allocation is the basis of teacher professional development and performance appraisal management. Yang (2020) divided the composition of teacher resources into two categories, "hard" and "soft", and believed that teacher resource allocation includes both hard and soft resources. Wang (2022) believes that teacher resources should be regarded as a kind of talent or educational resources, mainly relying on the market, the government, the discipline, the specialty, the teacher's quality and other aspects of the allocation, through the scientific and reasonable allocation of human resources, so as to make it maintain at a high level of output. Yu, et. al., (2023), on the other hand, claimed that the improvement of the overall quality of teachers depends on the optimal allocation of teacher resources in colleges and universities to be carried out without sparing any effort. Teacher resource allocation in this study includes individual professionalism, teaching ability, talent reward system, teaching equipment conditions, and teaching funds.

Teacher professional growth is a long and continuous development process, in which teacher professional development is the core throughout. Enhancing teachers' professional development ability is an important measure to ensure the quality of education, and the core of teachers' professional development lies in teachers' self-development, which mainly includes the enhancement of teachers' comprehensive quality, academic ability, and practical skills (Yang, et. al., 2024). Teachers' professional development can be understood in terms of "professionalization" and "developmental", with "professionalization" referring to teachers' professional teaching and research, which includes professional ability, professional knowledge, and professional emotion. "Professionalism" refers to teachers' professional teaching and research, including professional ability, professional knowledge and professional emotion. "Developmental" refers to the fact that teachers' professional development is a dynamic process that requires lifelong learning to promote their own professional growth (Tan, 2022).

Constructing a dynamic teacher development policy requires a full understanding of the developmental needs and characteristics of teachers' professional growth stages, and constructing incentive mechanisms that can promote teachers' career development (Wang, et. al., 2021). This study attempts to understand the current situation and needs of teachers' professional development in terms of incentives, management styles, and platform

construction, so as to derive the influencing factors affecting teachers' professional development as well as future challenges and opportunities. Teachers' professional development in this study refers to professional-related training, professional learning and exchange, professional department management, career development guidance, professional development management mechanism, and the mechanism of cooperation between universities and enterprises.

Performance appraisal is an evaluation method linked to teachers' work performance, which is a more common and effective evaluation method at present. Performance appraisal incentive mechanism in colleges and universities is an important element in the performance appraisal system, which requires quantitative or qualitative evaluation of teachers' personal performance, work quality, work attitude, etc., and rewards or punishments are given according to the results of the comprehensive appraisal in order to achieve the purpose of promoting reasonable competition and stimulating the enthusiasm for work (Sun, 2023). An effective performance management system can comprehensively evaluate and supervise teachers' work performance, regularly assess teachers' work performance, comprehensively understand teachers' own strengths and areas of development, promptly check the gaps, optimize the work flow, and reasonably allocate resources. Performance management can clarify school goals and enhance the competitiveness of colleges and universities. Performance management is not only an important management tool, but also a fulcrum to assist the rapid development of colleges and universities.

Currently, there are fewer studies that take the three variables of resource allocation, professional development and performance appraisal management of university teachers as research objects, and more studies that focus on case analysis and improvement paths of individual variables. At the same time, the existing studies lack a large number of samples and quantitative research data as support, and more empirical studies are needed to test the reliability of related theories and concepts.

This study argues that there is a close relationship between teacher resource allocation, professional development and performance appraisal management in colleges and universities, and that this relationship is of great significance for teacher career development. The purpose of this study is to provide guidance and reference roles for the management of teachers' professional development in colleges and universities and teachers' individual career development planning. Through this study, one can gain a deeper understanding of the relationship between teacher resource allocation, professional development and performance appraisal management in colleges and universities, so as to better formulate teacher career development planning and improve the competitiveness of professional development and career development potential of teachers in colleges and universities. At the same time, this study can also provide guidance for the talent development of enterprises and organizations, and cultivate more high-quality talents for the society.

Objectives of the Study - The main purpose of the study is to develop a career development plan for university management and individual teachers based on the allocation of resources, professional development and performance appraisal management of university teachers. Specifically, it aimed to determine the allocation of university teachers in terms of human resources, material resources, and information resources; to assess professional development in terms of operational mechanisms, management styles, platform construction, and institutional safeguards; assess the effectiveness of performance appraisal and management in terms of departmental management effectiveness and institutional innovations; test the significant relationship between the three variables, and put forward a plan for the professional development of college teachers to effectively improve teachers' work motivation and enhance self-knowledge.

2. Methods

Research Design - Quantitative descriptive research design was used in this study. This study aimed to systematically describe, summarize, and explain teacher resource allocation, professional development, and performance appraisal management in selected Chinese universities. The purpose of the study is to describe the

developmental status, problems, and developmental countermeasures of the variables of teacher resource allocation, professional development, and performance appraisal management in colleges and universities, and to derive the factors affecting the variables through the analysis of the variables, so as to set up reasonable plans and suggestions to promote the process of teachers' professional development. In this study, the questionnaires were distributed, data were collected, and analyzed and described using statistical analysis, charts, and weighted average scores. There is no causal analysis involved in the study, which mainly describes and summarizes the data.

Participants of the Study - This study used a random sampling method and established criteria for target screening and exclusion of respondents. The participants in this study were teachers in some Chinese universities, and the random sampling method within specific conditions was used to select respondents. During the sampling process, each teacher had an equal chance of being selected, which ensured the representativeness and randomness of the sample. This study set the criteria for the questionnaire respondents: some undergraduate colleges and universities in China refer to undergraduate colleges and universities that implement higher education in China, which are categorized into "985 project" colleges and universities, "211 project" colleges and universities, undergraduate colleges and universities affiliated with the central ministry, and undergraduate colleges and universities affiliated with the provincial government by level; Teachers who are currently enrolled in schools and are not retired at the age of 60 or below, who choose schools in different regions and levels of operation, take into account the diversity of the school's hierarchy and specialties, who have basic reading and comprehension skills for questionnaires, and who are willing to participate in the research and provide truthful information. In addition, the researcher set the exclusion criteria for the respondents: college, master's, and doctoral students; undergraduate college teachers under the age of 60; concentrated in the same school, region, or similar level of colleges and universities; cognitive or communication barriers that prevented them from accurately comprehending and answering the questionnaires; and refusing to participate in the research or providing inaccurate information.

As of 2021, there were 1,865,541,000 full-time college and university teachers nationwide, including more than 860,000 full-time university teachers, and 405 target respondents were sampled and screened. These respondents included teachers from four types of institutions: "985 Project" institutions, "211 Project" institutions, undergraduate institutions under the central ministry, and provincial undergraduate institutions. For each type of institution, 3-4 institutions were selected by region, and about 30 questionnaires were randomly distributed to each university. These teachers cover different levels of schools, different specialties, different ages, different educational groups, and have a certain degree of diversity, which is consistent with the purpose and questions of our study. The researcher ensured the representativeness and quality of the sample through the criteria of respondents and the validity screening of the questionnaire. This study provides an in-depth understanding of university teachers' resource allocation, professional development and performance appraisal management provides a basis for school management and teachers' professional development.

The criteria of respondents were clarified through random sampling, thus obtaining a representative sample of teachers, which contributes to the in-depth study of teacher resource allocation, professional development and performance appraisal management. At the same time, the selection and exclusion criteria of respondents are also conducive to eliminating bias and improving the reliability of the study. There are some shortcomings in the process of the study due to the limitations of time and space: the study period is from December 2023 to April 2024, and the study location is China. Although the interviewees covered groups of teachers at different levels of schools, different specialties, different ages, and different academic qualifications, the sample of interviewees was not rich enough, and the number of researches had some limitations because of incomplete geographic coverage, incomplete coverage of age at each stage, and large differences in specialties, which may lead to the generalization of the findings of the researcher's study. Therefore, a sample size of 405 was selected as our basis for this study.

Date Gathering Instruments - In this study, data were collected in the form of a questionnaire, which was modified and developed on the basis of a published study, and there is a certain degree of reliability. The questionnaire is divided into three parts, the first part is the teacher resource allocation form, the questionnaire refers to Bai (2020) master's thesis, "Research on the Economic Impact of Rural Teacher Resource Allocation",

the researcher extracted the key elements from the original thesis to verify and collated 23 items as the questionnaire content. The second part is the teacher's professional development table, the questionnaire refers to Lv (2022) dissertation, "The construction and implementation strategy of professional development mode for higher vocational teachers under the threshold of action learning theory", the researcher extracted some questions from the original dissertation, and formulated 22 items as the content of the questionnaire after modification. The third part is a reference to the paper "Research on Performance Assessment Mechanism of Individual Comprehensive Development of Higher Education Teachers" by Huang, et. al., (2019), which was modified and organized 23 items for the questionnaire.

The first part of the Teacher Resource Allocation Questionnaire, which was used to assess the school's management of resource allocation as well as the individual teacher's mastery of resources, was divided into three sub-scales totaling 23 questions, namely human resources, physical resources, and information resources. The second part of the questionnaire is the Teacher Professional Development Questionnaire, which is used to assess the school's management of professional development as well as the implementation of individual teachers' professional development, divided into four sub-scales totaling 23 questions, namely, operation mechanism, management style, platform construction, and system guarantee. The third part of the questionnaire was the Teacher Performance and Effectiveness Management Questionnaire, which was used to assess school performance management, with three sub-scales totaling 23 items, namely, departmental management, management effectiveness, and system innovation.

During the course of the study, the reliability and validity of the questionnaire were analyzed to ensure the validity of the questionnaire data. Before the official launch of the questionnaire, the researcher tested the feasibility of the questionnaire on a small sample of 30 teachers randomly selected according to the requirements between December 5 and December 8, 2023, uploaded the questionnaire through Questionnaire Star (<https://www.wjx.cn>), and collected 30 valid questionnaire results using the Internet. The researcher conducted descriptive statistics and correlation analysis of the questionnaire results. Descriptive statistical analysis included calculating the mean score, standard deviation and frequency distribution for each indicator.

Based on the test results of the small samples, the researcher initially concluded the reliability of the Teacher Resource Allocation Form, the Teacher Professional Development Form, and the Teacher Performance Management Form, which provided a guarantee of the validity of the questionnaire distribution. Relying on the questionnaire research data, the effective paths of universities to enhance teacher development are explored to meet the needs of teachers' professional development planning.

The researcher analyzed the reliability of the pre-survey data, mainly referring to the data value of Cronbach's Alpha. The Cronbach Alpha coefficient generally reaches 0.7 or more, which reflects the high reliability of the questionnaire and allows for further analysis of the questionnaire. The Cronbach-Alpha coefficients of the dimensions of the questionnaire in this study are greater than 0.7, indicating that the questionnaire has high overall reliability. In conclusion, a detailed overview of the indicators of the questionnaire on resource allocation, professional development and performance appraisal management of Chinese university teachers and their degree of reliability provides support for the preliminary evaluation of the reliability of the indicators, which is an important support basis for the reliability of the questionnaire. The dimensional differentiation is good, and the factor loadings fall on the corresponding dimensions. Overall, the indicators of Teacher Resource Allocation Questionnaire, Teacher Professional Development Questionnaire, and Teacher Performance Management Questionnaire, with high reliability and validity, can be used for research and analysis. In conclusion, these results provide a preliminary evaluation of the validity of the indicators, which is an important supporting basis for the validity of the questionnaires.

Date Gathering Procedure - The data collection of this paper was obtained through questionnaires. The questionnaires were distributed randomly at fixed points through QQ group and WeChat group to ensure the scientific and validity of the samples, and each teacher was required to complete a four-part questionnaire. The

first part of the questionnaire was the collection of basic information, describing their gender, age, education, and working hours. The second part of the questionnaire contained 23 questions related to teachers' resources, the third part contained 23 questions related to teachers' professional development, and the fourth part of the questionnaire contained 23 questions related to teachers' performance management, and the data collection was completed in November, 2023. Due consideration was given to ethics and protection of data privacy of the questionnaire participants during the data collection procedure, participants were asked to fill out a data privacy consent form to be attached to the questionnaire given to them. After exporting the questionnaires, the collected data will be imported into an Excel sheet to check the validity of the data and exclude invalid questionnaires. In order to reduce the generation of invalid questionnaires, the researcher made a detailed explanation of the intention of questionnaire distribution, confidentiality, etc. at the beginning of the questionnaire, and allowed respondents to fill in the questionnaire in an anonymous form, and the information of the investigators was kept confidential and used only as a purely academic research without any commercial use.

After the data collection was completed, the data was organized and the basic variable model was constructed. The results of the questionnaire were organized into Excel format, which was validated by a statistician, and statistical methods such as factor analysis was used to analyze the relationship and influence between the data. By exploring the relationship between the three variables of resource allocation, professional development and performance appraisal management of teachers in Chinese universities and testing their impact on the development of teachers' professional competence, a relevant plan is provided to help the implementation of teachers' professional development.

Data Analysis - The researcher predicted that the results of the questionnaire would be non-standardized because there is some variability in individual perceptions and evaluations. Therefore, it was processed through statistical methods used to interpret the data collected in the study: The psychological profile of the respondents was processed using standard deviation. Standard deviation, defined as the square root of the variance, is a statistical measure that calculates the dispersion of a data set relative to its mean. In observing the effects of teacher resource allocation, professional development implementation and performance performance management, MANOVA, Multivariate Analysis of Variance was used. MANOVA is a statistical process of comparing the means of multivariate samples and is usually used when there are two or more dependent variables, focusing on the results of focusing on the observation of the groups of subjects. On the other hand, Chi square was used to test the analysis of variance and correlation between the effect variables of Teacher Resource Allocation, Professional Development Implementation and Performance Management. Chi Square test is a test of statistical significance for categorical variables.

The basic information questionnaire and career toughness scale were used to conduct the questionnaire survey, and the data were processed and analyzed using SPSS25.0 statistical analysis software, mainly including independent samples t-test and analysis of variance (ANOVA). Results: The scores of each subscale and the total questionnaire of career toughness of college teachers ranged from 2.40 to 2.60, and there were differences in career toughness of teachers with different genders, ages, qualifications and years of working experience ($p < 0.01$), which were statistically significant.

Ethical Considerations - The ethical nature of the respondents' information was fully considered during the research process. Respondents were informed of the confidentiality of the information in the questionnaire with a non-disclosure agreement and the results were used only for the purpose of this academic research to ensure that the respondents were treated with respect in providing their opinions and answers to the questionnaire. All research protocols in terms of data collection were properly followed in accordance with the Data Privacy Act 2012. For the research study, ethical clearance was sought from the Research Ethics Committee of the University institution.

3. Results and discussion

The "information resources" item had the lowest weighted average score of 2.56. It shows that the construction

of information resources in universities still needs to be strengthened. With the advent of the digital age, the management of information resources in colleges and universities is facing great challenges and opportunities. The quantity and diversity of information resources in colleges and universities are increasing rapidly, including academic documents, research data, student information, library resources and other types of information resources. University information resource management is becoming more and more important in university management. Information resources are the basis of education and research, and the basis of strategic decision-making in universities. Effective management of information resources is conducive to serving education and research, and providing needed information for students, faculty and researchers. At the same time, the construction of characteristic resources is an important direction and means for the development of colleges and universities, and it is also the key for colleges and universities to improve their core competitiveness and international influence. Zhang (2023) put forward the principles of constructing characteristic information resource sharing in universities: consider the principles of openness, sharing and win-win. To ensure the characteristics of resources, the characteristics mainly come from academic research, discipline construction, integration of industry and education, education and teaching, social services and other aspects; The policy ensures the sharing of resources.

Table 1
Summary Table on Faculty Resource Allocation

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. Human resources	2.62	Agree	1
2. Material resources	2.57	Agree	2
3. Information resource	2.56	Agree	3
Composite Mean	2.58	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 - 1.49 = Strongly Disagree

Table 2
Summary Table on Professional Development

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. Mechanisms of operation	2.55	Agree	2.5
2. Management style	2.45	Agree	2.5
3. Platform construction	2.56	Agree	1
4. Institutional safeguards	2.49	Agree	4
Composite Mean	2.51	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 - 1.49 = Strongly Disagree

Table 2 shows the respondents' evaluation of teachers' professional development, with a weighted mean of 2.51, indicating that the respondents generally agreed. Among them, interviewees think that "platform construction" has the highest weighted average value of 2.56. In the era of Internet+, the scale and function of higher education in China have changed dramatically, coupled with the development of information technology and the internationalization of education, the platform construction has become the first position to serve the professional development of teachers, and the platform of online courses, the platform of cooperation between universities and enterprises, etc. have all facilitated the construction of professional development of teachers. have all facilitated the construction of teachers' professional development. The ideal of teaching professional development of teachers in local universities lies in the pursuit of a favorable external institutional environment, strong internal institutional safeguard conditions and teachers' willingness and ability to dedicate themselves to the teaching career (Peng, 2023).

The second is the weighted average of "operational mechanism" 2.55, indicating that the "operational mechanism" of professional development is well implemented. The operational mechanism of professional development refers to a series of systems, policies and activities established by universities to provide support, resources and incentives for promoting teacher professional development, aiming to help teachers continuously improve their professional ability so as to better adapt to the changes and challenges in the field of education. Zhang (2022) believes that the key elements of building the operational mechanism of professional development are: formulating clear professional development policies; clarifying the goals, principles and policies of teacher professional development to provide guidance and support for professional development; providing resource support, including the investment of funds, manpower, time and other resources; establishing a collaboration

mechanism to strengthen departmental collaboration and common development; setting up an evaluation and interactive sharing reflection mechanism to provide effective reflection through regular evaluation; and establishing a sharing and cooperation mechanism to encourage the establishment of a professional community among teachers.

The weighted average value of "institutional guarantee" is the lowest, which is 2.45, indicating that there is still room for improvement in professional development "institutional guarantee". The system guarantee of professional development refers to the establishment of a series of systems and policies to ensure that teachers' professional development is effectively supported and guaranteed, thus improving teachers' teaching level and professional quality. Bu (2021) thinks that there are the following problems in the professional development system: the lack of cultural mechanism for teachers' professional development, the lack of competitive mechanism for teachers' professional development and the lack of cooperative mechanism for teachers' professional development. These institutional guarantees usually include the following aspects: including financial support, study schedule, training resources and other policies. Universities provide financial support for teachers' professional development, ensure that teachers have enough study time to participate in professional development activities; They also establish an evaluation mechanism to evaluate teachers' academic achievements, teaching effects and other professional development achievements, establish a professional title evaluation mechanism closely related to teachers' professional development and provide relevant information and resource support.

The weighted average of "management style" is 2.45, indicating that there is still a lack of "management style" in professional development. Management style is the general name of the principles, objectives and methods adhered to in the management process. Management style varies from person to person. Because of the great difference between personality and work attitude and dealing with people, management style depends more on the top planning and design of the leadership. Excellent leaders and their leadership styles can directly affect employees' work attitudes and behaviors, improve employees' work efficiency and stimulate their potential, thus achieving the ultimate strategic goal of university management (Wang, 2024).

Table 3

Summary Table on Performance Appraisal Mechanism

Indicators	Weighted Mean	Verbal Interpretation	Rank
Sectoral management	2.57	Agree	1
2. Management effectiveness	2.51	Agree	2
3. Institutional innovations	2.50	Agree	3
Composite Mean	2.53	Agree	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 – 1.49 = Strongly Disagree

Respondents' ratings of the performance appraisal mechanism for teachers are presented in Table 3. The weighted mean of 2.53 indicates that the respondents generally agreed. The highest weighted mean of 2.57 was given to the option of "departmental management". Departmental management is the foundation and focus of administrative work, which ensures that the work of the university is based on the law and rules; at the same time, it creates a positive, harmonious and united working atmosphere. Teachers need to change their thinking and get ready for the pluralistic and common governance of universities; combine scientific division of labor with evaluation and incentive mechanism; focus on the management concept of "people-oriented", strengthen the construction of office culture, strengthen the construction of departmental culture, and create a fair and harmonious working atmosphere (Zhang, 2023).

The weighted average of the second option "management effectiveness" is 2.52. The effectiveness of university education management is mainly reflected in the systematization of the organizational structure, the humanization of the management concept, and the rationalization of resource allocation. In the systematization of organization, there is a clear division of responsibilities between departments, good communication, and a management mode in which each department does its own job and shares information. In terms of the humanization of management concepts, colleges and universities should enhance their competitiveness, realize their own long-term development, and carry out the educational concept of "people-oriented" throughout the whole process. In

terms of resource allocation, teaching resources, scientific research resources, administrative resources, and basic security resources have been reasonably allocated (Cheng, 2020).

The weighted average value of the option "institutional innovation" is 2.51. Institutional innovation refers to the process of reforming and innovating rules and regulations, policies and measures, and management systems in an organization or a society, so as to adapt to new changes in development needs, improve efficiency and promote development. University system innovation is the fundamental guarantee to maintain the good operation of colleges and universities. The inspiration brought by the construction of educational system innovation: firstly, it is necessary to locate a high level of vision and adhere to the construction goal of pursuing excellence; secondly, it is necessary to operate dynamically and deal with the relationship between stability and change; thirdly, it is necessary to build a grass-roots academic organization system, with the creation of knowledge as the core (Chen, 2023). Institutional innovation requires the joint support and guarantee of conditions such as clear problem identification and demand, positive organizational culture, leadership support, effective communication and collaboration, data support and decision analysis, legal and policy support, resource guarantee and investment, and risk management and control, which is difficult.

Table 4
Relationship Between Faculty Resource Allocation and Professional Development

Human resources	rho-value	p-value	Interpretation
Mechanisms of operation	0.290**	<.01	Highly Significant
Management style	0.245**	<.01	Highly Significant
Platform construction	0.333**	<.01	Highly Significant
Institutional safeguards	0.200**	<.01	Highly Significant
Material resources			
Mechanisms of operation	0.397**	<.01	Highly Significant
Management style	0.405**	<.01	Highly Significant
Platform construction	0.445**	<.01	Highly Significant
Institutional safeguards	0.438**	<.01	Highly Significant
Information resource			
Mechanisms of operation	0.392**	<.01	Highly Significant
Management style	0.308**	<.01	Highly Significant
Platform construction	0.448**	<.01	Highly Significant
Institutional safeguards	0.337**	<.01	Highly Significant

Legend: Significant at p-value < 0.01

The correlation between teacher resource allocation and professional development is shown in Table 4. The calculated r-value indicates that there is a moderate direct correlation between the two while the calculated p-value is less than alpha level. The result shows that there is a significant relationship between the two which implies that the better the teacher resource allocation, the better the professional development.

As can be seen from the table, there is a significant positive relationship between teacher resource allocation and professional development. Xu (2024) believes that teacher professional development includes not only teachers' personal accumulation of education-related knowledge, mastery of education and teaching skills, and improvement of classroom teaching ability, but also the transformation of teachers' personal teaching attitude. It is very important to gain professional advantages by accumulating and developing teacher resources. Teacher resources provide material guarantee for teacher development, create teaching conditions, and broaden the development space of teachers. The reasonable distribution of teacher resources ensures that teachers enjoy the same educational resource support, thus improving the fairness and sustainability of professional development.

Teacher resources in colleges and universities are one of the most important resources in the modern economy and society, and they need to be reasonably adapted to place teacher resources above a position that maximizes the utility of output. The work of teacher resource allocation in colleges and universities is the focus of personnel management work in every college and university, which needs to be combined with external factors such as national policy, social environment and economic level, combined with the school's own planning, scientific research tasks and objectives, and to develop and utilize, optimize and improve, and integrate resources of college

and university teacher resources from the overall situation of colleges and universities (Wang, 2023).

Teachers' professional development cannot be separated from scientific research, teaching and other support, through scientific research to promote learning, improve the theoretical quality of teachers, the establishment of a new concept of education, according to the needs of society and constantly carry out the reform of teaching; improve their own cultivation, and actively participate in the training to improve their own qualities; strengthen the self-reflection, and constantly improve the level of professionalism; to establish a "student-centered". The service spirit of "student-centered" is the internal motivation to promote the professional development of teachers; create a good school atmosphere and build a good teaching environment. And all these measures require a reasonable teaching resource allocation mechanism. In addition, it can be seen from the table that the degree of correlation between teachers' resource allocation and professional development varies among different types of resources (such as human resources, material resources, and information resources), among which the degree of correlation between information resources and the relationship between platform construction is the highest (.448**), which indicates that in the process of informatization of educational resources in China's colleges and universities, the sharing and exchange of information resources is particularly important and is a key content in the work.

On the contrary, the correlation between human resources and institutional security is the lowest (.200**), indicating that colleges and universities are lagging behind in the management process of management concepts, human resources allocation is unreasonable, human resources incentive mechanism is unreasonable, the nuclear mechanism is not perfect, and the assessment content is too single and other undesirable phenomena (Qi, 2021). Colleges and universities need to enhance the initiative and creativity of teachers by standardizing the management mechanism.

Table 5
Relationship Between Faculty Resource Allocation and Performance Appraisal Mechanism

Human resources	rho-value	p-value	Interpretation
Sectoral management	0.258**	<.01	Highly Significant
Management effectiveness	0.518**	<.01	Highly Significant
Institutional innovations	0.331**	<.01	Highly Significant
Material resources			
Sectoral management	0.422**	<.01	Highly Significant
Management effectiveness	0.512**	<.01	Highly Significant
Institutional innovations	0.372**	<.01	Highly Significant
Information resource			
Sectoral management	0.382**	<.01	Highly Significant
Management effectiveness	0.576**	<.01	Highly Significant
Institutional innovations	0.423**	<.01	Highly Significant

Legend: Significant at p-value < 0.01

The correlation between teacher resource allocation and performance appraisal management is shown in Table 5. The calculated r-value indicates that there is a moderate direct correlation between the two while the calculated p-value is less than the alpha level. This indicates that there is a significant relationship between the two and also implies that the better the teacher resource allocation, the better the performance appraisal management.

The table shows that there is a significant positive relationship between teacher resource allocation and performance appraisal management. Teachers' resources include human resources, material resources, and information resources. Performance appraisal in colleges and universities is the core content of resource management work, but also the difficult content. The resource competition among colleges and universities is fierce, how to reasonably allocate the existing resources and mobilize teachers' enthusiasm for work has become the basic work of resource management in colleges and universities. Performance appraisal is an important appraisal mechanism for resource management in colleges and universities, which helps teachers to recognize themselves clearly and realize self-improvement, and aims to enhance the innovation ability of faculty and staff and stimulate their work enthusiasm (Wei, 2021).

Effective performance appraisal management can promote the optimal allocation of resources and improve the quality of education. And reasonable resource allocation will provide support and guarantee for performance appraisal and jointly promote the development of school education. Through the evaluation of performance appraisal, teachers' work performance and ability level can be more accurately evaluated in order to allocate teachers' resources more scientifically. Clear performance appraisal standards can stimulate teachers' work motivation and promote teachers to improve their performance (Wang, 2023). The fairness of resource allocation improves the performance appraisal effect. Effective performance appraisal management and resource allocation promote each other, forming a virtuous cycle. In addition, it can be seen from the table that the degree of correlation between teachers' resource allocation and performance appraisal varies among different types of resources (e.g., human resources, material resources, and information resources), among which the correlation between information resources and the effectiveness of management is the highest (.576**), which indicates that in the era of the Internet+, reasonable information resource management plays a role in promoting the management of the school as a whole, and is mainly manifested by online teaching, personnel resource management, library information, performance appraisal, financial funding and other aspects. In the era of information technology, the information technology means represented by big data and cloud computing make the management work of colleges and universities to be applied and popularized, improve the efficiency of the management department, the business process tends to be standardized and networked, which plays an important role in promoting the development of the industry (Liao ,2023).

Conversely, the relationship between HR and line management has the lowest degree of correlation (.258**), and the degree of correlation between HR and line management can vary depending on the organizational structure, management model, and objective setting. HRM is closely related to individual departments, but the degree of correlation between HR and departmental management may be lower in some cases: the organization adopts a decentralized and independent management model, and departments may be more autonomous in their HRM; departments recruit and train independently; departments have an internal management model; and different departments may have different managerial objectives and business needs, resulting in different HR needs and concerns are different.

Table 6
Relationship Between Professional Development and Performance Appraisal Mechanism

Mechanisms of operation	rho-value	p-value	Interpretation
Sectoral management	0.357**	0.000	Highly Significant
Management effectiveness	0.427**	0.000	Highly Significant
Institutional innovations	0.355**	0.000	Highly Significant
Management style			
Sectoral management	0.391**	0.000	Highly Significant
Management effectiveness	0.451**	0.000	Highly Significant
Institutional innovations	0.438**	0.000	Highly Significant
Platform construction			
Sectoral management	0.380**	0.000	Highly Significant
Management effectiveness	0.514**	0.000	Highly Significant
Institutional innovations	0.363**	0.000	Highly Significant
Institutional safeguards			
Sectoral management	0.381**	0.000	Highly Significant
Management effectiveness	0.477**	0.000	Highly Significant
Institutional innovations	0.424**	0.000	Highly Significant

Legend: Significant at p-value < 0.01

The correlation between professional development and performance appraisal management is presented in Table 6. The calculated r-value indicates that there is a moderate direct correlation between the two, while the calculated p-value is less than the alpha level. This indicates that there is a significant relationship between the two and also implies that the better the professional development, the better the performance appraisal management. As can be seen from the table, there is a significant positive relationship between teacher professional development and performance appraisal management. Teachers' professional development is the process of improving teaching ability, professional knowledge and educational philosophy in the teaching process. Teachers' professional

development is directly related to teachers' teaching effectiveness and comprehensive quality improvement. And performance appraisal management is to quantify the teaching effect and comprehensive quality through the mechanism.

The performance appraisal of universities is mainly conducted in four aspects: ethics, ability, diligence and performance, of which "ability" is to assess the level of professional knowledge and technical skills, educational and teaching ability, scientific research ability, management ability and production and service skills. "Performance" is to assess the fulfillment of duties and responsibilities, including teaching, management and service, the quantity and quality of work done, the level of results achieved and the effectiveness of the community. The contents of "ability" and "performance" performance appraisal are closely related to professional development. In addition, as can be seen from the table, the degree of correlation between teachers' professional development and performance appraisal management varies between different types of resources (such as operational mechanisms, management methods, platform construction, and institutional safeguards), with the highest degree of correlation between platform construction and management effectiveness (.514**), indicating that the construction of various informatization platforms in colleges and universities is of great help to the management of the school. At present, the platforms of colleges and universities mainly contain the following platforms: teaching platform (including laboratory informatization platform, virtual simulation teaching platform, online teaching platform, continuing education platform, etc.), scientific research platform (including university-enterprise cooperation platform, scientific research sharing platform, etc.), and college service platform (including library platform, mental health education platform, party branch construction platform, trade union service platform, etc.).

With the development of the times, the requirements for teaching, scientific research, service and technological innovation are getting higher and higher, and the organizational form is more complex, involving more disciplines and departments, and it is difficult for a single department and discipline to support the implementation of major projects and intelligent management, and the construction of platforms provides the possibility of orderly information management. Theoretical studies about the importance of cross-disciplinary platforms in universities, typical cases and other theoretical studies have been enriched, and the construction practice of relevant cross-disciplinary platforms, has also achieved certain results (Zhang, 2023).

On the contrary, the correlation between the operational mechanism and the departmental management relationship is the lowest among them (.357**), indicating that the operational mechanism still has some problems in management. The professional development operation mechanism mainly contains the coordination of teacher training system, standardized management of teacher training, synergistic operation of teacher professional development, evaluation of teacher professional development and construction of guarantee mechanism of teacher professional development (Peng, et. al., 2023). The operation mechanism of professional development in colleges and universities is a systematic and other management systems, interlocked to form a closed loop, and its operation and implementation relates to the interests of each teacher in colleges and universities, college and university teachers have different professions and different development directions, so it is inevitable that there will be a multitude of difficult to adjust the situation.

4. Conclusions and recommendations

The majority of respondents female, aged 30-40, with a high percentage of age 41-55, the highest percentage of master's degree holders, and the highest percentage of working hours of 10-20 years. Respondents rated the allocation of human resources to teachers as high, with the highest average score for participation in training to help improve teaching. Respondents agreed on teachers' human resources, material resources, information resources, professional development management style, professional development system guarantee, performance department management, performance management effectiveness and performance system innovation career needs. Teachers in colleges and universities pay more attention to human resources, material resources, information resources, platform construction and management departments, which are relatively well-constructed and highly

satisfied, and there are still some places that need to be improved and perfected in terms of management methods, institutional safeguards, and institutional innovations. There is no significant difference between teacher professional development and performance appraisal management and personal characteristics, such as gender, age, education background and service years. There is no significant difference between teacher resource allocation and individual characteristics, such as sex, age and educational background. There is a significant difference between the allocation of teacher resources and the service years of teachers, indicating that there is little relationship between the allocation of teacher resources and the service years of teachers, and personal characteristics will have an impact on teacher resources, but reasonable planning and improving one's own quality in the later stage will change the allocation of teacher resources. There is a significant correlation between teachers' resource allocation, professional development and performance appraisal management in Chinese universities; the better the teachers' resource allocation, the better the professional development; the better the teachers' resource allocation, the better the performance appraisal management; the better the professional development, the better the performance evaluation management. The study proposed a teacher professional development program to help schools clarify management goals, improve teacher resource management, professionalism, and clear orientation.

Schools may do in the top-level structure, establish and improve the teacher mobility mechanism, optimize the process management of college teacher resources, improve the output management of college teacher resources, provide hierarchical and classified systematic training, and set up professional development services and guarantees in combination with the actual situation of teachers. Colleges may actively participate in school career development related activities and policy making, and create professional development direction by combining college professional characteristics. Teachers may take the initiative to complete the task of professional development and enhancement, improve their professional level, teaching and research ability, optimize the concept of "Internet +" education and teaching, and formulate career planning for teachers. The government may provide financial guarantee and platform resources, and give policy support in talent support policy and school-enterprise cooperation policy. Enterprises may engage in mutual training with university professions, create innovative teacher teams, help teachers enhance their practical abilities, and realize curriculum co-construction, resource sharing and information interoperability. The proposed teacher career development programs may be submitted for discussion and implementation. Relevant researches on the establishment of teachers' professional competence prediction may be undertaken,

5. References

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