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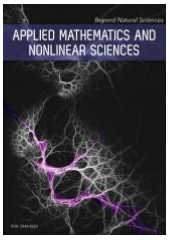

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Research on Numerical Analysis Methods of New Quality Productivity Development in Colleges and Universities Oriented to Party Building Leadership

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Abstract

This paper selects key indicators between party building system inputs and new quality productivity output elements of universities and adopts the correlation method to study the relationship between such elements. From the perspective of mathematical analysis, we can show the interactive relationship between intelligent party building inputs and scientific and technological output elements of universities. The questionnaire method is used to conduct an in-depth investigation and research on the actual situation of postgraduate students' innovation ability and cultivation. The results of the study show that the elements of funding for the construction of the intelligent party building system show a rising trend from 2020 to 2024. The input of funding for smart party building is proportional to the output, i.e., the greater the input, the more output of new quality productivity in colleges and universities. When investigating the importance of party building in the cultivation of postgraduate students' innovation abilities, 48.2% of the students believe it is very important. About 58% of the students think that the party building system of their students plays a certain role in cultivating innovation ability.

Keywords: Correlation model; Input-output elements; Intelligent party building; Mathematical analysis.
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1 Introduction

New quality productivity refers to the form of productivity development with digitalization, intelligence, networking and sustainability as the main characteristics. It is formed and developed with the support of a new generation of information technology such as e-commerce, the Internet of Things, artificial intelligence, big data, cloud computing and so on globally [1-4], with the characteristics of informatization, innovation, platform and sharing. The development of new quality productivity is of great significance in promoting industrial upgrading, improving production efficiency, improving environmental quality, increasing employment opportunities, and promoting economic growth [5-8].

Compared with the traditional productive forces, the new quality productivity is the contemporary advanced productive forces spawned by the revolutionary breakthroughs in technology, innovative allocation of production factors, and deep transformation and upgrading of industries, and it is the new quality of productive forces characterized by new technologies, new models, new industries, new industry, new industry, new fields, new tracks, new kinetic energy, and new advantages [9-12]. The new quality of productivity has three main characteristics: first, it is in line with the inherent requirements of China's high-quality development. Second, it is futuristic, integrated and innovative. Third, it is high-efficiency and high-tech. The development of new quality productivity requires that "the virtuous circle of education, science and technology and talents should be unimpeded, and the working mechanism of cultivating, introducing, utilizing and rationally flowing talents should be improved [13-16]. According to the new trend of scientific and technological development, we should optimize the discipline setting and talent training mode of institutions of higher education so as to cultivate the urgently needed talents for the development of new quality productive forces and the promotion of high-quality development". The development of new quality productivity requires the cultivation of new quality talent, which also puts forward new issues for the cultivation of talent in colleges and universities [17-20].

This paper firstly refers to the research method of scientific and technological input-output system, quantitatively demonstrates and qualitatively describes the funding structure of intelligent party building from 2010 to 2024, and measures the correlation between the funding and the output of the results by using correlation measure. Then, on the basis of the statistical data of the input of university wisdom party building funding and the output of scientific research results, the relevant elements of input and output are selected, and the gray correlation analysis modeling tool and regression analysis are used to correlate and analyze the elements in the structure of university scientific research results and the input of university party building funding in turn. Finally, questionnaires were distributed to students and tutors through sampling, and the valid questionnaires were statistically analyzed to understand the role of party building in improving teaching quality.

2 Intelligent Party Building System for Higher Education Institutions

Based on the strong boost of the Internet, big data, and artificial intelligence technology, intelligent party building has become a new mode and new form of information construction for party building in colleges and universities, and colleges and universities have gradually constructed a smart party building system that integrates intelligent and efficient, precise and fine, real-time perception, and collaborative sharing. According to the viewpoint of system theory, any system has the characteristics of wholeness, hierarchy, dynamics, openness, etc. In the era of big data, the intelligent party building system in colleges and universities is both similar to general systems and unique in its theoretical qualities.

The formation of technology-data-application-user progressive hierarchical system structure is shown in Figure 1.

The structure of the intelligent party building system in colleges and universities refers to the form of connection between a number of elements that make up the intelligent party building system in colleges and universities. System theory emphasizes that the internal structure of the system is hierarchical, i.e., “the orderly interruption and continuity of the internal organization of the system, or the hierarchical order of the organic combination of system elements”. The intelligent party building system of colleges and universities in the era of big data is a three-dimensional, multilevel network structure system covering four levels: technology, data, application, and users. At the technical level, with the upgrading and coding of information technology such as big data, cloud computing, artificial intelligence, etc., the optimization of the intelligent party building system in colleges and universities has stronger technical support, using big data technology to store party building big data, using cloud computing technology to quickly analyze and process party building big data, and transforming mined data resources into intelligent decision-making reference for party building in colleges and universities with the help of artificial intelligence technology. At the level of data resources, building a party building data resource base with massive information is the basis for the construction of intelligent party building systems in colleges and universities, which includes basic information data, decision analysis data, business data, service data, etc., teachers, students, party members and party organizations at all levels, and at the same time, it should make use of big data technology to bring together and analyze all kinds of information data on the teaching and scientific research of teachers and students and party members, and highly integrate the party affairs, administration, medical care and logistics within the university, group organizations and other departments’ data and relevant information data of off-campus cooperation units, precipitating and sharing data resources for intelligent party building in colleges and universities. Talent cultivation, discipline construction, scientific research, social service, cultural construction, international exchange, etc. are all integrated into the university’s intelligent party building system at the application level. The upgrade of university intelligent party building systems in the era of big data has resulted in the two-way co-promotion of university party building work and career development by big data. At the user level, the party committee of universities, the party organizations of faculties (departments), the party branches of teachers and students (departments), and the party members of teachers, staff and students belong to four levels, which have cross-cutting and independent user needs and functional requirements. The party committee of universities assumes the role of leadership and decision-making, the party organizations of faculties (departments) are mainly in the arrangement and implementation, the party branches of teachers, staff and students focus on learning and implementation, and the party members of teachers and students are required to play an exemplary role. Party members of teachers and students are required to play a pioneering and exemplary role. The system combines all elements into a unified whole through its unique structural hierarchy. The intelligent party building system of colleges and universities in the era of big data is hierarchical and gradually refined.

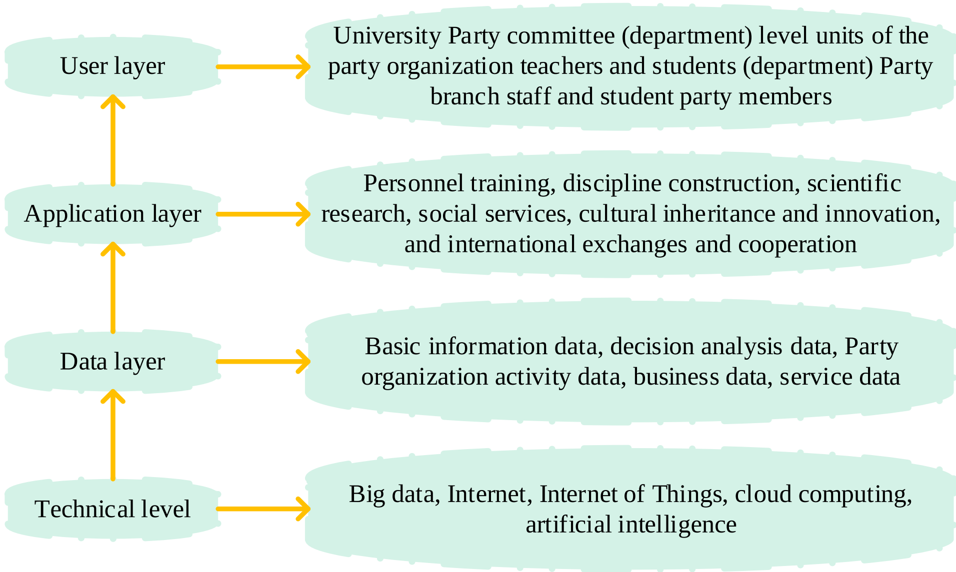

Figure 1. Form a technical - data - application - the level of the user's level

3 Research methodology on party building to lead the development of new quality productivity

3.1 Measurement of the correlation between inputs and outputs

3.1.1 Introduction to correlation analysis

The correlation analysis method is a method that uses mathematical and statistical methods to measure the correlation between factors. Observe the trend of the geometric curves of two sets of serial data. If the trend is synchronized and the similarity is strong, then it can be said that there is a strong correlation between the two. On the contrary, the correlation is weak. The specific steps are:

1) Determine the reference sequence (parent sequence) and the comparison sequence (child sequence). Generally, reference sequence $\{x_0^{(0)}(t)\}$ and comparison sequence $\{x_i^{(0)}(t)\}(i=1,2,\cdots m;t=1,2,\cdots N)$ are determined.

2) Dimensionless processing of data. Since the factors that are the subject of the study come from different fields, the units of their quantitative data (i.e., the scale) may be different, and the lack of uniformity in the scale will cause bias in the results, it is necessary to do the dimensionless processing before the correlation analysis to transform them into comparable data sequences.

3) Calculate the correlation coefficient (ξ_{0i}). Let the reference sequence after dimensionless processing be $\{x_0(t)\}$ and the comparison sequence be $\{x,(t)\}$, then the formula for calculating the correlation coefficient of the two sequences at the moment $t=k$ is:

$$\xi_{0i}(k)=\frac{\Delta_{\min}+\rho\Delta_{\max}}{\Delta_{0i}(k)+\rho\Delta_{\max}} \tag{1}$$

Where $\xi_{0i}(k)$ denotes the correlation coefficient of the two sequences. $\Delta_{0i}(k)$ denotes the absolute difference between the two sequences at the moment k. Δmin and Δmax represent the minimum and maximum values of the absolute difference between the two sequences at each moment, respectively. In order to avoid distortion of the results due to too large a value of the maximum absolute value, a resolution factor of p is introduced to increase the difference between the values of the correlation coefficients. The smaller p is, the greater the resolution. $\rho \in (0,1)$ Usually $p = 0.5$ is taken for the calculation. The value of the correlation coefficient $\xi_{oi}(k)$ varies in the interval (0, 1], i.e. it reaches a maximum value of 1 at the moment Δmin and a minimum value at the moment Δmax.

4) Calculate the degree of correlation (r_{0i}) which is the average value of the correlation coefficient, and the formula is:

$$r_{0i} = \frac{1}{N}\sum_{k}^{N} \xi_{0i}(k) \tag{2}$$

Where r_{0i} indicates the correlation degree of the two sequences, and N indicates the length of the sequence, i.e. the number of data.

5) Ranking correlation order. All sub-sequence of the unified parent sequence of the degree of correlation according to the order of small to large sequential arrangement, we get the correlation order, the correlation order can intuitively reflect the sub-sequence relative to the parent sequence of the “advantages and disadvantages” of the degree. The more correlation there is, the more the sub-sequence influences the parent sequence, and vice versa, the less.

3.1.2 Input-output static analysis models

“Science and technology innovation can give rise to new industries, new modes and new dynamics, and is the core element in the development of new-quality productivity.” The core of the development of new productive forces lies in scientific and technological innovation, while the key to scientific and technological innovation lies in talents, and the key to the cultivation of talents lies in education. Therefore, the development of new productivity must adhere to the “science and technology is the first productive force, talent is the first resource, innovation is the first driving force, in-depth implementation of the strategy of developing the country through science and education, the strategy of strengthening the country through talent, the strategy of innovation-driven development, to open up new areas of development and new tracks, and to continuously shape the development of new kinetic energy and new advantages”.

The input-output mathematical model is a mathematical model based on the input of the university smart party building system and the output table of new quality productivity in universities. Each row of the input-output table can be represented by a mathematical relationship equation, which can be written as an equation:

$$\begin{cases} x_{11} + x_{12} + \cdots + x_{1n} + y_1 = x_1 \\ x_{21} + x_{22} + \cdots + x_{2n} + y_2 = x_2 \\ \cdots \\ x_{n1} + x_{n2} + \cdots + x_{nn} + y_n = x_n \end{cases} \tag{3}$$

The above system of equations can be written as:

$$\sum_{j=1}^{n} x_{ij} + y_i = x_i \ (i = 1, 2, \cdots, n) \tag{4}$$

Based on the row sum model, it is possible to calculate the direct consumption coefficient a_{ij}, whose formula is $a_{ij} = x_{ij} / x_j$, which leads to $x_{ij} = a_{ij} x_j$. Substituting this result into equation (4), the direct consumption coefficient formula can be obtained:

$$\sum_{j=1}^{n} a_{ij} x_j + y_i = x_i \quad (i = 1, 2, \cdots, n) \tag{5}$$

Translated into matrix form it can be expressed as:

$$AX + Y = X \tag{6}$$

A in equation (5) is the direct consumption factor a_{ij} matrix.

It is obtained by derivation:

$$X = (I - A)^{-1} \cdot Y \tag{7}$$

Taking $B = (I - A)^{-1} - I$, this is the full consumption factor matrix, which is obtained by substituting into equation (7):

$$X = (B + I) \cdot Y \tag{8}$$

The model presented above is the mathematical model of rows, also known as the row model. Using this model, the corresponding result is the full demand coefficient matrix of the value-based input-output table.

3.1.3 Mathematical modeling by columns

The columns of the input-output tables can also be transformed into relational equations to create a mathematical model that reflects the process of value formation of input factors in each sector. A system of equations is created based on the columns of the input-output tables and the quantitative relationships:

$$\begin{cases} x_{11} + x_{21} + \cdots + x_{nl} + d_1 + v_1 + t_1 + m_1 = x_1 \\ x_{12} + x_{22} + \cdots + x_{n2} + d_2 + v_2 + t_2 + m_2 = x_2 \\ \cdots \\ x_{1n} + x_{2n} + \cdots + x_{nn} + d_n + v_n + t_n + m_n = x_n \end{cases} \tag{9}$$

The above system of equations can be written as:

$$\sum_{i=1}^{n} x_{ij} + d_j + v_j + t_j + m_j = x_j \quad (j = 1, 2, \cdots, n) \tag{10}$$

Substituting the direct consumption factor matrix, which is $x_{ij} = a_{ij} x_j$, into equation (10) yields:

$$\sum_{i=1}^{n} a_{ij} x_j + d_j + v_j + t_j + m_j = x_j (j = 1, 2, ..., n) \tag{11}$$

$$a_{ej} = \sum_{i=1}^{n} a_{ij} \quad n_j = d_j + v_j + t_j + m_j \tag{12}$$

Eq. (12) can then be expressed as:

$$a_{ej} x_j + n_j = x_j (j = 1, 2, \ldots, n) \tag{13}$$

Express equation (13) in matrix form as follows:

$$A_c \cdot X + N = X \text{ or } (I - A_c) X = N \tag{14}$$

3.2 Multiple linear regression analysis of inputs and outputs

Regression analysis is a mathematical method to deal with the correlation between variables, is the most commonly used mathematical and statistical method, has a deep and vivid practical background, is generated from the production practice and science and technology and has become a powerful tool for analyzing and solving problems in modern science and technology. The solutions for prediction, control, production process optimization, industrial and agricultural production, and scientific research in various fields have a very important and wide range of applications.

Regression analysis studies the statistical regularity between variables with correlation, mainly including the following: model, least squares estimation of parameters, significance test of regression equations, interval estimation of regression coefficients, prediction and control, fit test, general treatment of nonlinear regression, which can be transformed into a univariate linear regression problem and multiple linear regression.

In multiple regression analysis, when the dependent variable y is interfered with by external influences, these influences are defined as independent variables, and if there is a certain correlation between y and the existence of a certain degree of correlation, a multiple regression model can be established based on the dependent variable y and each influence factor. In many practical problems, the relationship between the dependent variable Y and the independent variables is not obvious, and it needs to be tested and verified by certain significance tests to finally determine whether there is a good and significant relationship between the two if they do not have a good significance between them, then it means that there is no correlation between Y and. To test the significance of a regression equation, the statistic F is generally quoted as a constraint of the model.

In the multiple regression analysis method, the regression equation does not necessarily represent that every independent variable is significant to the dependent variable. At this time, the significance of the independent variables should be investigated, the independent variables with high significance will be preserved, and those with low significance will be excluded so that the significance effect of the model can be effectively suppressed. After eliminating the irrelevant influencing factors, the parameters of the independent variables of the constructed model can also be optimized so that the intrinsic connection between Y and Xi can be studied more accurately, and at the same time, the deformation of the dependent variable can be analyzed better.

4 Numerical analysis of party building for the development of new quality productivity in universities

4.1 Structure of funding for smart party building inputs

The funding structure of intelligent party building is determined by the composition of funding source channels. For higher education institutions, their funding sources mainly include government-invested funds, enterprise-commissioned funds, and various revenues transferred to research funds. The structure of the funding for intelligent party building is shown in Figure 2. According to the relevant statistical literature and data information, the annual input of each funding element basically shows an upward trend, and the upward trend increases steeply from 2022 to 2024. The government input funding and enterprise commissioned funding have seen a significant increase, while the change in various income transfer out funding has remained flat.

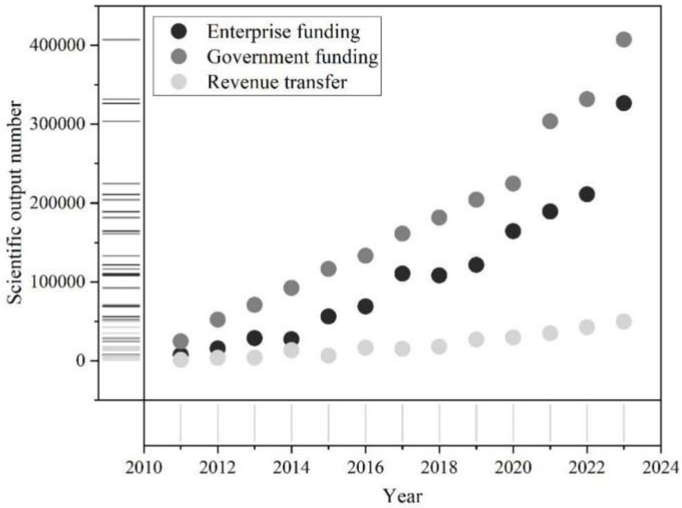

Figure 2. The structure of scientific research funds

The income transfer to research funding in the university smart party construction funding usually includes: Y1, Y2, Y3 in turn for the patent (number), academic papers, the number of awards and other university research output system characteristics sequence, that is, the university in the above funding support of scientific research output. x1, x2, x3 in turn for the government allocated research funding, enterprise commissioned funding, as well as a variety of income transfer to scientific research funding and other factors related to university The above calculation analyzes the sequence of factors related to the scientific research output system. $\gamma_{11}-\gamma_{13}$: Y1 and X1, X2, X3 correlation. $\gamma_{21}-\gamma_{23}$: Y2 and X1, X2, X3 correlation. $\gamma_{31}-\gamma_{33}$: Y3 and X1, X2, X3 correlation degree.

In research funding, the correlation matrix A of university research results and related funding factors is calculated according to the correlation analysis model:

$$A=(\gamma_{ij})=\begin{pmatrix}\gamma_{11} & \gamma_{12} & \gamma_{13}\\ \gamma_{21} & \gamma_{22} & \gamma_{23}\\ \gamma_{31} & \gamma_{32} & \gamma_{33}\end{pmatrix}\begin{pmatrix}0.676 & 0.7925 & 0.6352\\ 0.6785 & 0.8112 & 0.6347\\ 0.6672 & 0.7824 & 0.6275\end{pmatrix}$$

Therefore, colleges and universities, in the process of teachers' team construction, should establish the old, middle-aged and young pairing mechanism, playing the role of transferring and helping so that the young people can improve their practical ability and enterprise serviceability as soon as possible under the guidance of the old teachers who are rich in practical experience so that they can become competent in enterprise service. In addition, in the process of party management, colleges and universities should take corresponding incentives to encourage and support teachers to participate more in the social service of enterprise production and practice and to strive for more investment in enterprise-commissioned scientific research funds, which in turn improves the efficiency of the output of scientific research results in colleges and universities.

4.2 Correlation analysis of input and output elements

This part is the main content of this research, focusing on exploring the impact and contribution of party building inputs to the output of new quality productivity, with the help of the mathematical and theoretical characteristics of empirical analysis, and combined with qualitative analysis to summarize the internal laws of the university party building input and output system. Using SPSS13.0 software to make Pearson correlation coefficient analysis between six-party building inputs and six output elements of the university in 2015-2023, according to the analysis, needs to list the correlation coefficients of the intelligent party building inputs and outputs as shown in Table 1. Therefore university's new quality productivity output outputs a total of six selected indicators: scientific and technical papers output (kjlw), the number of patent applications (zlsq), the number of patents granted (zlsy), new patent licensing (xzlxk), licensing revenue (xksr), the U.S. patent citations to the university's scientific and technical papers (yz). Therefore, a total of seven indicators were selected for university party funding: doctoral scientists and engineers (bskg), full-time graduate student enrollment (yjs), gross domestic product (GDP), the total amount of university R&D expenditures (R&Djf), the number of funds invested in the funding (jcyj), the number of funds invested in applied development (yykf), and the amount of R&D equipment expenditures (R&Dsb).

On the basis of the correlation analysis, a one-way regression analysis was conducted one by one with each of the six scientific and technological output indicators as dependent variables and each of the six party building input indicators as independent variables, to summarize the impact of the party building input variables on the output variables. In addition, given the complexity and multicollinearity within the university party building system, it is necessary to prefer the party building input variables that have more significant associations with scientific and technological outputs for multiple linear regression analysis. Multiple linear regressions were conducted with the S&T output indicators as the dependent variable and the party building inputs, which are highly correlated with the S&T output variables, as the independent variables to summarize the common impact and influence of multiple party building variables on the S&T outputs. From the table of correlation coefficients of university S&T inputs and outputs, it can be seen that the various S&T inputs of the university have different impacts on the output of S&T papers. Among them, only the number of full-time postgraduate students enrolled and the input of application development funds passed the significance level test with correlation coefficients of 0.702 and 0.739, respectively, with respect to the scientific and technological paper output variables. This indicates that there is not a bi-directional interaction between the university's scientific and technological paper outputs and the multiple-party input variables, but a uni-directional and less significant correlation.

Table 1. Pearson correlation table

		bskg	yjs	R&Djf	jcyj	yykf	R&Dsb
kjlw	Pearson correlation coefficient	0.735	0.702*	0.612	0.562	0.739*	0.625
	Significance level (double side)	0.162	0.045	0.094	0.135	0.028	0.085
zlsq	Pearson correlation coefficient	0.995**	0.821**	0.962**	0.996**	0.764*	0.932**
	Significance level (double side)	0.002	0.008	0.001	0.002	0.018	0.001
zlsy	Pearson correlation coefficient	0.975**	0.593	0.840**	0.884**	0.526	0.765**
	Significance level (double side)	0.012	0.102	0.006	0.003	0.160	0.022
xzlxk	Pearson correlation coefficient	0.995**	0.685*	0.895**	0.935**	0.603	0.765**
	Significance level (double side)	0.002	0.048	0.002	0.002	0.095	0.006
xksr	Pearson correlation coefficient	0.985**	0.685*	0.884**	0.902**	0.623	0.829**
	Significance level (double side)	0.003	0.042	0.003	0.001	0.078	0.005
yz	Pearson correlation coefficient	0.816	0.259	0.584	0.647	0.164	0.478
	Significance level (double side)	0.112	0.536	0.112	0.075	0.682	0.214

It should be noted that correlation analysis is mostly performed on variables with strong linear correlation between them, while the curvilinear correlation between them is less evident. In order to objectively and comprehensively analyze the impact of the inputs on the university's science and technology thesis, curve estimation is needed, and appropriate curves are selected and fitted to describe the true correlation between the variables. The correlation between the variables will be visualized below through scatter and fitted curve plots of the variable groups. Taking the X-axis to denote the various inputs of the university and the Y-axis to denote the output of scientific and technical papers of the university, the scatter and fitted curves of the corresponding relationships of the variable groups are shown in Fig. 3. Among them, the coefficient of determination R2 of the cubic model is the highest at 0.999 between the number of doctoral scientists and engineers of the university (independent variable) and the output of scientific and technical papers of the university (dependent variable), so the cubic model is selected as the correlation model between the doctoral scientists and engineers of the university and the output of scientific and technical papers of the university (X in the equation denotes the number of doctoral scientists and engineers of the university, and Y denotes the output of scientific and technical papers of the university):

$$Y = 400.105 - 0.015X^2 + 4.20E - 006X^3$$

From the point of view of mathematical analysis, the fitted curve analysis and regression model in the above column illustrate that there is a positive correlation between university doctoral scientists and engineers and university scientific and technical paper output, but there is a unidirectional relationship between scientific and technical paper output and the number of doctoral scientists and engineers.

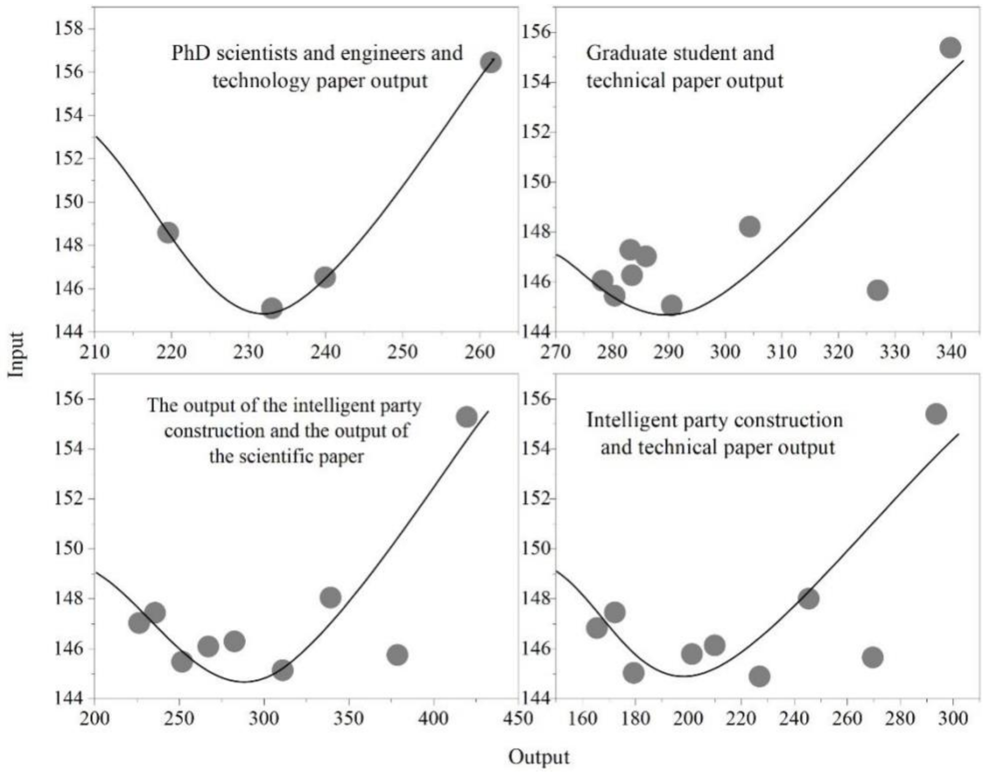

Figure 3. Dispersion and fitting curves

4.3 Party Building Leads to New Quality Productivity Improvement in Teaching and Learning

Leading the teaching management with party building, realizing the effective combination of party building work with school education and teaching management, the school has gained a double harvest in party building and teaching management.

This survey mainly utilizes the method of questionnaire and interview to investigate the current situation of master's degree graduate students' innovation ability cultivation, which mainly includes 3 parts: the first part is mainly to investigate the graduate student's academic research ability. The second part of the survey is aimed at the overall situation of current graduate education, including the cultivation objectives, overall curriculum, teaching methods and teaching tools, tutor guidance, assessment and evaluation and other aspects. The third part of the survey mainly focuses on the overall evaluation of party building work in the current cultivation of graduate students' innovative abilities. It tries to understand and grasp the current situation of the cultivation of postgraduate innovation ability from multiple perspectives, analyze the influence factors of the existing problems and deficiencies, and provide a realistic basis for exploring reasonable improvement methods and countermeasures.

Figure 4 shows the results of the survey on the current status of graduate students' innovation ability: when asked about the current status of graduate students' innovation ability, 51.20% of the students chose "average", 2.75% of the students chose "relatively strong", 0.2% of the students chose "very strong", and the rest of the students chose "poor" or "very poor". At the same time, the subjective evaluation of graduate students' innovation ability also tends to be low, among which only 8.63% think that their innovation ability is "relatively good" or "very good", 48.45% think that their innovation ability is "not very good" or "very bad", and 42.92% think that their innovation ability is "average".

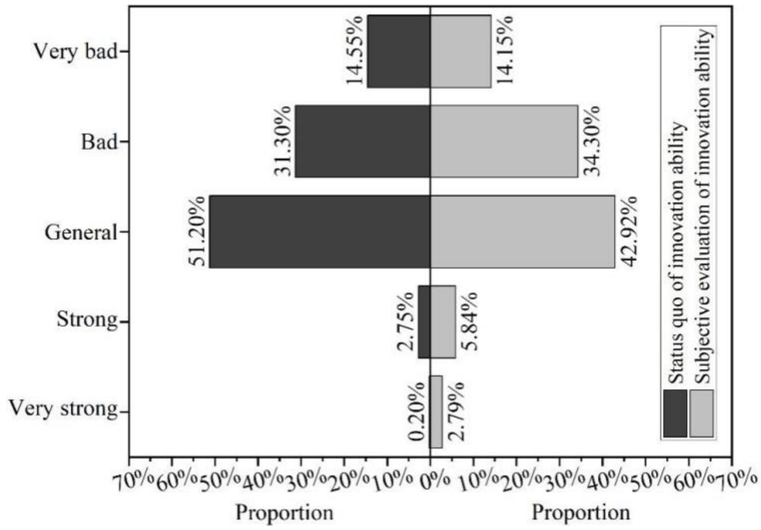

Figure 4. Status quo and subjective evaluation of innovation ability

Figure 5 shows the results of the survey on the current situation of graduate students' innovation ability training: when asked about the importance of graduate students' innovation ability training, 48.2% of students think it is "very important", 39% think it is "relatively important", 11.42% think it is "average", and 1.38% and 0% of students choose "less important" and "very little important". When asked about the role of the party building system in their school on the cultivation of innovation ability, only 5.84% of the students chose "providing favorable conditions", 50.20% of the students chose "having a certain role", and nearly half of the students chose "not conducive to the cultivation of graduate students' innovation ability", and "it is not clear". Only 0.46% chose "unhelpful". It can be seen that graduate students have fully realized the importance of party building to the cultivation of innovation ability. However, the role of the party building training system in the current research system of colleges and universities on the cultivation of the innovation ability of students in this major is not obvious enough or does not provide favorable conditions for it. The training of graduate students' innovation ability needs to be further strengthened through a specific analysis of the results of questionnaires and interviews.

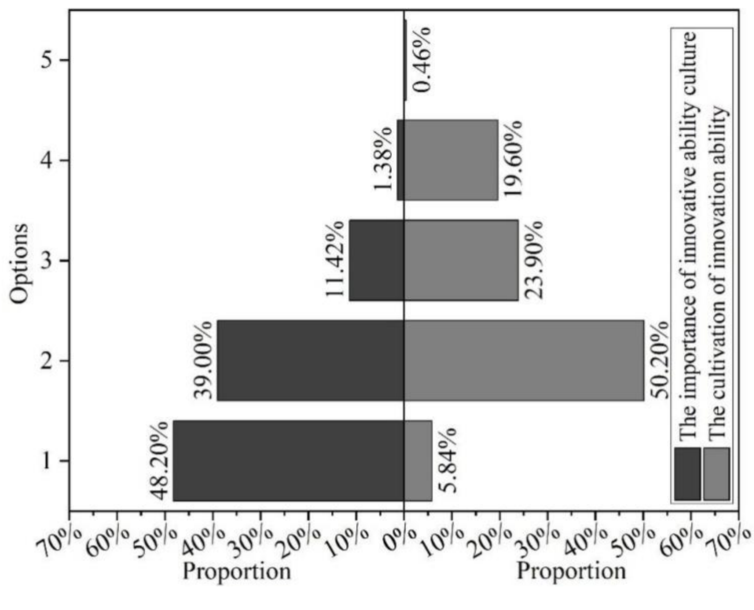

Figure 5. The culture of the new ability of party construction to innovate

5 Conclusion

In this paper, the correlation analysis method was used to measure the correlation between the inputs of intelligent party building and the outputs of new quality productivity using empirical research. Questionnaires are also utilized to investigate the improvement of teaching quality led by party building, and the following conclusions are drawn:

1) The more perfect the management system of intelligent party building, the more relevant funds are invested in scientific research, which in turn improves the efficiency of the output of scientific research results in colleges and universities.

2) There is a positive correlation between the input of intelligent party building and the output of scientific research results, which can promote scientific and technological innovation and the transformation of scientific research results.

3) Party building can also promote the quality of postgraduate education. About 60% of the students believe that building community has a role in improving the quality and productivity of education.

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3) The 2023 Science and Technology Innovation Strategy Special Fund (College Student Science and Technology Innovation Cultivation) Project of Guangdong Province: Research on Adaptability of Higher Vocational Education to Labor Market Demand in Guangdong-Hong Kong-Macao Greater Bay Area (NO. pdjh2023b0817).

References

[1] Guocheng, W. A. N. G., & Zhenfeng, C. H. E. N. G. (2024). New Quality Productivity and Basic Economic Modal Transformation. Modern Economic Science, 46(3).

[2] Ruales Guzmán, B. V., Brun, A., & Castellanos Domínguez, O. F. (2019). Quality management as a determinant factor of productivity: A systematic literature review. International Journal of Productivity and Performance Management, 68(4), 675-698.

[3] Venturini, F. (2022). Intelligent technologies and productivity spillovers: Evidence from the Fourth Industrial Revolution. Journal of Economic Behavior & Organization, 194, 220-243.

[4] Rew, D., Jung, J., & Lovett, S. (2020). Examining the relationships between innovation, quality, productivity, and customer satisfaction in pure service companies. The TQM Journal, 33(1), 57-70.

[5] Anh, V. N. M., Anh, H. K. N., Huy, V. N., Huy, H. G., & Duc, M. L. (2023). Improve productivity and quality using lean six sigma: A case study. International Research Journal on Advanced Science Hub, 5(3), 71-83.

[6] Mujan, I., Anđelković, A. S., Munćan, V., Kljajić, M., & Ružić, D. (2019). Influence of indoor environmental quality on human health and productivity-A review. Journal of cleaner production, 217, 646-657.

[7] Fan, H., Li, Y. A., & Yeaple, S. R. (2018). On the relationship between quality and productivity: Evidence from China's accession to the WTO. Journal of International Economics, 110, 28-49.

[8] Pipkin, S., & Fuentes, A. (2017). Spurred to upgrade: A review of triggers and consequences of industrial upgrading in the global value chain literature. World Development, 98, 536-554.

[9] Wang, H., Cui, H., & Zhao, Q. (2021). Effect of green technology innovation on green total factor productivity in China: Evidence from spatial durbin model analysis. Journal of Cleaner Production, 288, 125624.

[10] Fagerberg, J. (2018). Technological progress, structural change and productivity growth: a comparative study. In Innovation, Economic Development and Policy (pp. 214-232). Edward Elgar Publishing.

[11] Wise, R. D., & Niell, M. C. (2021). Capital, science, technology and development of productive forces in contemporary capitalism. Monthly Review-An Independent Socialist Magazine, 72(10), 33-46.

[12] Ozgen, C. (2021). The economics of diversity: Innovation, productivity and the labour market. Journal of Economic Surveys, 35(4), 1168-1216.

[13] Foster, L., Grim, C., Haltiwanger, J. C., & Wolf, Z. (2018). Innovation, productivity dispersion, and productivity growth (No. 24420). National Bureau of Economic Research.

[14] Ortega-Argiles, R., & McCann, P. (2021). The Innovation-Productivity Paradox. In Background Paper for the OECD-EC High-Level Expert Workshop Series "Productivity Policy for Places.

[15] Zuo, J., Lu, W., & Jia, C. (2021). Relationship between the cultivation and incentive mechanism of senior educational talents. International Journal of Emerging Technologies in Learning (iJET), 16(22), 99-112.

[16] Lee, J. T. (2014). Education hubs and talent development: Policymaking and implementation challenges. Higher Education, 68(6), 807-823.

[17] Qi, Y., & Wang, J. (2020). A talent cultivation model for improving the innovation ability of college students in scientific research. International Journal of Emerging Technologies in Learning (iJET), 15(18), 151-164.

[18] Cui, H. (2021, June). Dynamic Optimization of Specialty Structure of Higher Education Based on Big Data Technology. In 2021 IEEE International Conference on Educational Technology (ICET) (pp. 117-121). IEEE.

[19] Chen, D. (2023). Optimization Approaches for Higher Education Management in the Era of Big Data. Adult and Higher Education, 5(19), 129-134.

[20] Musakuro, R. N. (2022). A framework development for talent management in the higher education sector. SA Journal of Human Resource Management, 20, 1671.