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Research into the impact of an imbalanced teaching-academic research evaluation system on the quality of higher education: based on the mediation effect of the sense of belonging to a university

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University faculties are duty-bound to shoulder the functions of both teaching and doing scientific research, but they have been repeatedly criticized for emphasizing research over teaching. The current study analyzes the imbalance between teaching and scientific research in faculty evaluation system from three aspects through both quality study and quantity study: the evaluation subject, the weights difference in promotion, and the prediction of salary. Based on that, the influential effects of unbalanced evaluation system on long-term development of education has been explored. The current study also puts forward the moderating effect of the sense of belonging to colleges and universities. The result shows organizational belonging can significantly weaken the negative effects of the unbalanced evaluation system on education. Based on this, this paper makes further suggestions on the construction of university faculties' evaluation system and the promotion of their sense of belonging.

KEYWORDS

teaching, scientific research, unbalanced evaluation system, organizational belonging, moderating effect

1 Introduction

Universities fulfill diverse functions, including teaching, academic research, and social services. They are both the creators and mediators of knowledge. Within such a multitask environment, the teachers undertake the responsibilities of both teaching and academic research. With the evolution of social development and knowledge, the relation between teaching and academic research is also fluid, shifting from a stage led by teaching to a stage that emphasized both teaching and academic research. Currently, teaching and academic research are in conflict with each other and their relation is vulnerable.

The behavior choices of individuals within an organization are subject to incentives, the purpose of which is to induce the enthusiasm and creativity of individuals, and such incentive theory is also applicable to teachers. If one discusses the individual behavior of teachers without considering the environment and policy orientation, the conclusion drawn as such

may be biased. This study intends to explain and explore the relation between teaching and academic research from the source. It holds that the splitting of teaching and academic research has not happened naturally, but has been formed in the imbalanced incentive system that “prioritizes academic research over teaching” among universities.

Although universities lay equal stress to teaching and academic research, they have generally spent more efforts in pursuing academic research goals. For example, teachers are generously rewarded for publishing high-level papers and successfully applying for research projects, their research outcomes can be converted into teaching workload, and the most important criterion in the professional title evaluation is also the research results, while their teaching ability is often ignored. In addition, the distribution of academic research and teaching resources within a university is also imbalanced and even the educational philosophy of many universities focuses on academic research while ignoring the teaching effect, which eventually leads to a decline in the education quality (Wang et al., 2022; Wei and Chen, 2022a,b).

Therefore, how to evaluate teaching and academic research work and how to alleviate the negative impact of imbalances in teaching and academic research evaluation on the quality of higher education will be an important task in the quality development of Chinese universities. Unlike the situation in other countries, Chinese universities have a dual identity, i.e., they are both institutions of higher learning and work units to the teachers. Due to long-term publicity and influence, university teachers have a strong sense of loyalty and “sense of belonging” to the work units they are in. This study discusses whether the sense of belonging to a university play a role in alleviating the negative impact of imbalanced teaching and academic research evaluation on the quality of higher education, and through empirical data and analysis, provides a scientific basis for policy-making concerning the development of university teachers and the quality development of higher education.

2 Literature review

2.1 Unbalanced dual career: teaching and academic research

University teachers undertake a variety of tasks, including undergraduate teaching and research, graduate guidance, dealing with external affairs, internal academic management, etc. Their identity has transformed from pure “teaching craftsmen” into scholar-type experts and scientists. Due to the superposition of various complicated work affairs and multiple roles, the task of teaching itself has been impacted. They need to make strategic choices among various matters, and make trade-offs among interests, responsibilities and self-interests. Fairweather (2002) believes that teaching and academic research “seem” to reinforce each other, but the evidence is not convincing. He adopted the national statistics on university teachers in the US and analyzed 29,764 teachers from 962 universities. Among them, 54% had outstanding achievements in academic research, 45% excelled in teaching, and only 2% performed well in both teaching and academic research. The result proves again that the time and energy of teachers are limited, and the majority of them cannot balance teaching and academic research. Qin and Zhao (2002) assumed that the daily working hours of teachers were fixed at 8 h and built an efficiency

function so that teachers could balance teaching and paper publishing within the limited time. The result shows that teaching and academic research are in effect in conflict with each other, and the time they consume, respectively, is not equivalent in efficiency.

2.2 The incentives for university teachers are essentially a multitask incentive model

The multitask-agency model was first proposed by Holmstrom and Milgrom (1991). It is believed that when the agency needs to achieve two mutually alternative tasks (i.e., the two activities compete with each other), the agency will spend more energy on tasks that are easily observed, while ignoring tasks uneasily observed. In a multitask situation, incentives can not only stimulate the motivation to work hard, but also guide the agency’s attention distribution. In the context of universities, teachers face many tasks such as teaching, academic research, and social services. The incentives toward them should be based on the efforts they invest in teaching and the achievements they accomplish in academic research. However, the evaluation of their work outcomes is uncertain and entails a long period for verification. Thus, universities can only evaluate and motivate teachers through explicit indicators, resulting in the dominance of academic research in incentives.

Nearly 90% of teachers deem promotion and lifelong tenure the most important, as well as the income. Even in teaching-oriented universities, teachers were willing to “do academic research” if they had time (Yan, 2012). Zhang et al. (2008) used the Cobb–Douglas production function to describe the input and output of teachers, and found that the impact of input in teaching and academic research on the output, the cost coefficient of teaching input and academic input, the impact of risk aversion measurement and exogenous uncertainty on the output have an important impact on the intensity of incentives. Teaching and academic research, as vastly different tasks, differ in importance and the cost of teachers’ input. Compared with academic research which has an extensive impact, teaching is a local phenomenon, because the career development and prestige establishment of teachers rely much more on their academic performance, thus resulting in the unbalanced development of teaching and academic research.

2.3 Unbalanced incentives

The “priority of academic research over teaching” seems to be an individual decision, but is inseparable from the imbalanced incentive system.

2.3.1 Existing teacher evaluation methods

Since the 1980s, new managerialism that advocates performance indicators has penetrated into the evaluation system of higher education. From the objects of evaluation, teaching evaluation indicators mainly include the teaching workload, classroom evaluation, number of students guided (like guidance on thesis writing) and quality of guidance (like students’ awards), etc., while research evaluation indicators are mainly the output of research, which include research projects, outcomes and awards, paper publication, monograph (textbook) publication, patent acquisition,

etc. From the methods of evaluation, teaching evaluation methods include student evaluation, peer evaluation, leadership evaluation and teaching outcomes, while research evaluation methods include peer evaluation, research outcomes, citation analysis and research income (Dai, 2000; Zhang et al., 2022). The creativity and delayed effects of teaching labor are blocked; the phenomenon of emphasizing quantity or speed is common; disciplines and students are not distinctive, and many indicators and weights are designed based on experience merely (Zhao and Yang, 2004; Tian et al., 2006). Such an evaluation system has led to the “materialization” of teaching labor. As the utilitarian demands for teachers are increasingly strong and education management applies information methods in an unprecedented way, a tedious quantitative index system has been implemented and the quantitative model in the evaluation of university teachers has been further intensified. As a result, the belief in that “knowledge is an end in itself” is weakened, the subjectivity of university teachers is covered and their occupational burnout is increased (Shen and Liu, 2016). At the same time, unlike teaching activities, research outcomes can be materialized to a higher degree and their evaluation indicators are clearer and converted into currency more easily, with more significant social income. Therefore, the dominance of academic research in evaluation is inevitable (Bao and Wang, 2012; Li et al., 2014).

2.3.2 The first embodiment of imbalanced incentives: inequality in the salaries and rewards

Empirical research shows that academic research outcomes have a significant predictive effect on teachers’ salaries and rewards, yet the input of teaching time does not have this function [11]. Based on a survey among American universities, Melguizo and Strober (2007) indicated that funded projects or papers published were positively related with the incomes of teachers, while the input of time in teaching did not lead to the increase of incomes. Fairweather (2005) used data from the National Center for Education Statistics (NCES) of the United States to analyze the relative value of teaching and academic research in the basic salary of teachers, respectively, from 1992 to 1993 and from 1998 to 1999, and the result proved that both the input of time in classroom teaching and undergraduate teaching were negatively related with the basic salary of teachers, while graduate teaching and academic research were positively related with the basic salary. Even after the rise of teaching-oriented academic activities, the economic compensation of teaching activities has not been reflected. In addition, the predictive effect of teaching and academic research on wages has decreased with the changes of the times. Bak and Kim (2015) analyzed the scores of 1,052 university teachers in academic output and teaching evaluation from 2004 to 2010 and the result showed that the economic incentives for academic research had a positive predicative effect on paper publication (for every \$100 incentive increased, the possibility of academic publication increased by 59.4%), while the economic incentives had a negative predicative effect on the score of teaching evaluation. Under such institutional incentives, the increase of academic publications is not significantly related to the teaching score, and the relation between the two is very weak.

2.3.3 The second embodiment of imbalanced incentives: inequality in promotion

Research achievements are important in teachers’ promotion (Yeh et al., 2022). Gibbs (1995) believes that occupational development

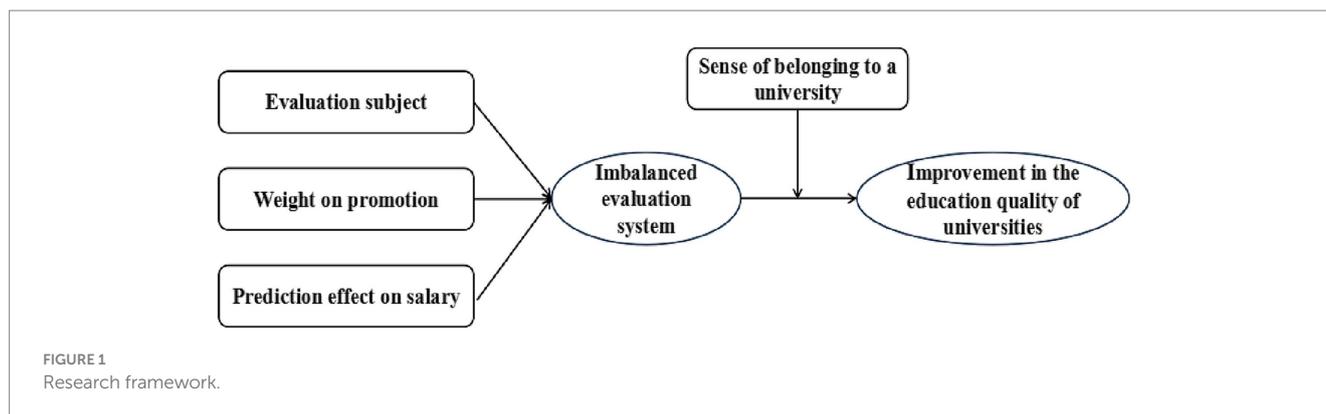
is inevitably accompanied by the increase of income and prestige. High-level promotion should take into account the leading edge of teachers in teaching and teaching should always run through the professional path. However, although 87% of universities consider excellent teaching as a condition for promotion, only 45% actually deem it as a compulsory standard, while 38% consider academic research, rather than teaching, as the basis for promotion. The evaluation of leaders in universities also emphasizes academic research. According to *The Goals, Responsibilities and Evaluation Indicators of the Presidents of Universities*, in the extra point column, 22 points are related to teaching (such as the title of renowned teachers and teaching achievement awards), while 53 points are related to academic research (such as the number of national talents and the number of national laboratories). Peng Zicheng took the University of Chinese Academy of Sciences as an example and pointed out that compared with teaching, paper publication, research projects and research rewards can not only bring economic benefits for teachers, but also “add points” in the evaluation of professional title (Peng, 2005).

The weight of academic research on promotion increases with professional levels (Sear, 2021). Hannan and Silver (2000) summarized that teaching had a larger role as one was promoted as a senior lecturer, yet when one was to be promoted as an associative professor or professor, the decisive factor was academic research, rather than teaching, which was still important, though. Parker (2008) conducted a coding analysis to the promotion texts of 140 universities in the United Kingdom and the frequency analysis showed that different positions had different requirements for teaching and academic research. The promotion standard of senior lecturers emphasizes multi-tasking and expertise-based multi-tasking, while that of associate professors values pure researchers or versatile researchers, and that of professors values outstanding researchers and versatile researchers. In short, in the evaluation of higher titles, academic research is more important (Figure 1).

The imbalanced evaluation system directly affects teachers’ behavior mode. Although they generally believe that teaching and academic research are positively related, the input of time in them has a rejection effect and academic research has clearly affected teaching effect. To deal with this dilemma, the unique features of the academic occupation must be considered (Yan, 2018; Sarwar et al., 2021).

2.4 The mediation effect of the sense of belonging to a university

The university was originally born as a “Scholars’ Guild.” University teachers are connected with their discipline, major, university and institution, which constitutes a complicated “matrix” and gives rise to different senses of belonging. The sense of belonging reflects the recognition of identity and self-worth. Studies show that the sense of belonging to a university can enhance teachers’ input in learning (Zhang and Li, 2018) and promote their academic performance (Zhao, 2018) and ability development (Yuan and Zhang, 2020). There are few researches on the sense of belonging of university teachers, but those on the sense of belonging to a discipline and organization are many. Studies show a universal law that the sense of belonging to a discipline is stronger than that to an organization, yet the two senses of Chinese teachers are basically the same. This may



be inseparable from China's long-standing "unit system." In organization and management, Chinese universities are different from universities in North America in the institutionalized elitism and work unit system, from which their other differences originated. The two characteristics, rooted in the revolutionary tradition of the Communist Party of China and China's collectivist culture, will not change fundamentally. The "work unit" has no counterpart in the English culture and the work unit system is a major characteristic of contemporary China. The work unit not only completes its specific social functions, but also is responsible for satisfying the living needs of employees (Zhao, 2006). Therefore, the work unit is a community of work and life with formal social functions. Cultivating and strengthening such sense of belonging and identity is the core in the cultivation of organizational culture for a work unit. Due to long-term publicity and influence, employees generally have a "work unit" complex, which means that they rely on the work unit psychologically. For a long time, Chinese universities are both universities and units. Due to long-term publicity and influence, teachers have gradually had loyalty to their university and a unit complex, with their "host" identity more obvious than their "employee" identity (Zhao, 2006).

Although the "unit system" is being disintegrated, the sense of belonging to a university in Chinese university teachers still cannot be ignored. The sense of belonging to a discipline has a different impact path with that to a university. Because research work is strongly liquid and has a wide range of radiation, excellent research as a "hard currency" can rapidly give teachers an impact in their major or even discipline, and then facilitate their promotion in the academic system and flow among academic institutions. In contrast, the efficacy of teaching is delayed and local: the talent cultivation quality of universities is improved so slow that the sense of belonging to a discipline is turned into motivation to research, while the sense of belonging to a university is turned into input in teaching.

In summary, in the context of building "Double First Class" universities, returning to the original intention of academic work and coordinating teaching and research are a long-term plan for universities. University teachers engaging themselves in teaching and research activities are not only driven by the need of earning a living, but also, as Weber said, "summoned" by their innermost being pursuing value and rationality. Therefore, this study focuses on the micro level of teachers and through questionnaire surveys and semi-structural interviews, deconstructs the evaluation system of teaching and research, so as to verify the impact of an imbalanced evaluation system on the quality of higher education.

3 Research design

3.1 Research framework

The research approach of this study is as follows. First, by analyzing the evaluation subjects of teaching and academic research, their weight in promotion, and their predictive effect on the salary, the study answers whether the current evaluation system of Chinese universities is unbalanced. Secondly, if the first question has an affirmative answer, the study then examines how such an imbalanced evaluation system will affect the quality improvement of higher education. Finally, combined with the unique circumstances of the "work unit" system among Chinese universities, the study explores the regulative role of the sense of belonging and to what degree the improvement of such sense of belonging can alleviate the impact.

Based on previous research (Shen and Xiong, 2013), after controlling interference variables, this study deconstructs the evaluation subject of teaching and academic research, their weight on promotion and their predictive effect on salary to verify whether the evaluation system of teaching and academic research is imbalanced and then analyzes how such imbalance will affect the education quality of universities and how to alleviate this adverse effect. The research framework is shown in 3.1:

3.2 Data source

This study uses data from the 2022 *Asian Academic Career Transformation Survey*, which adopted a layered sampling survey. This survey was based on the 2007 *International Academic Career Transformation Survey*, which was translated and localized by the Graduate School of Education of Peking University. The questionnaire was conducted on the academic career of full-time university teachers (excluding administrative, teaching assistants, and part-time staff) in domestic public universities, focusing on the organizational environment and academic career development. It mainly consisted of six parts, namely the occupation and profession, general work and activities, teaching, academic research, management, and personal background. It was conducted around the globe, involving over 20 countries and regions, and used scientifically selected indicators with good reliability and validity. The survey involved 28 universities in China (including 3 universities in Project 985, 6 universities in Project 211 and 19 regular undergraduate universities) and collected 2,809

effective samples (with a 94% recovery rate), including 1,456 male teachers and 1,285 female teachers, and covering various disciplines and professional titles. From the distribution of disciplines, compared with data in the 2017 yearbook, the proportion of humanities and engineering teachers is lower than that of social science and science teachers. From the distribution of professional titles, the proportion of teachers holding a junior and deputy senior titles is relatively high (Table 1).

In addition to the questionnaire, this study also uses the interview method to enhance the authenticity and reliability of data analysis. The method of data collection is a semi-structure interview and the sampling method is purposive sampling. Because young teachers are in the early phase of their career and have more difficulties in balancing teaching and research, most empirical studies were conducted among young teachers. Compared with quantitative research, qualitative research only selects a small group of people to reflect the actual voices of the subjects, reveal the process, and clarify what kind of environment shapes the phenomenon, so as to provide evidence for quantitative data. The interviewees were teachers aged between 35 and 40 as and the questions included “How do you view the relations between teaching and academic research?,” “How does your university evaluate teaching and academic research?,” and “What are the similarities and differences of teaching and academic research in promotion and salary improvement?.” Other questions may also be asked and the basic information of five interviewees is shown in Table 2.

3.3 Variable measurement

Variables and their operational definitions involved in this study are shown in Table 3.

4 Data analysis

4.1 Evaluation of teaching and research

First, this study analyses the composition of teaching and academic research evaluators. The fixed administrative evaluation, academic peer evaluation, and student evaluation form an equilateral triangle. The vertex represents the importance of the parties in evaluation. The closer the distance to the vertex, the larger role of evaluators in evaluation. In teaching evaluation, the evaluators are students (74% checked), followed by administrative leaders (67% checked leaders of the department, 35% checked the senior management staff of the university) and colleagues (63% checked colleagues of the same department and 13% checked peers outside the university). In comparison, the evaluators of research are administrative leaders (66% checked leaders of the department and 46% checked senior management staff of the university), followed by peers (41% checked peers of the same department and 36% checked those outside the university) and students (only 12% checked). It can be seen that teaching evaluation is subject to geographical restrictions, and its major evaluators are students, leaders and peers of the department, which shows the feature of being local. The evaluators of research have a higher level and a wider range of radiation, which is more global. See Figure 2 for details.

TABLE 1 Comparison between the data sample of the *Asian Academic Career Survey* and the national norm.

	National norm		Data sample	
Humanities (literature, history, philosophy and art)	389,498	24%	437	17.1%
Social science (economics, management, education and law)	444,164	27%	858	33.6%
Science	182,424	11%	440	17.2%
Engineering (engineering, agriculture and medicine)	617,162	38%	822	32.1%
Total	1,633,248	100%	2,527	100%
Senior	208,917	13%	178	15.5%
Deputy senior	490,184	30%	1,085	35.1%
Intermediate	644,154	39%	898	42.4%
Junior and untitled	289,993	18%	396	7%
Total	1,633,248	100%	2,527	100%

The national norm data is sourced from the 2017 statistics of faculty and staff in institutions of higher learning in China and the 2017 statistics of full-time teachers in different disciplines in China.

TABLE 2 Information of interviewees.

No.	Name	Sex	Title	Type of university	Major/discipline
1	LION	Female	Lecturer	Regular	Education
2	BEAUTY	Female	Associate Professor	Regular	English
3	MOUNTAIN	Male	Lecturer	Regular	Mineral engineering
4	DRAGON	Male	Associate Professor	University in project 985	Sociology
5	KUN	Female	Lecturer	University in project 985	Medicine

In addition to the composition of evaluators, the study examines their influence in decision making. In teaching evaluation, administrative force has the largest influence on decision making (46.8% of the teachers checked university-level heads and 16.8% departmental heads), followed by academic force (only 15.7% checked academic communities like the academic committee and the professors association), and students (only 4.3%). The result shows that teaching evaluation has a serious separation of name and reality. Although students account for a large part in evaluators, they do not have decisive influence. Yet, in the evaluation of academic research, the proportion of evaluators is consistent with their influence. The administrative force represented by university-level leaders is ranked first (49.9%), followed by academic communities like the academic committee and the professors association (27.4%). Such consistency

TABLE 3 Relevant variables.

Type	Name	Indicator	Operational definition
Evaluation system of teaching and research	Subject of evaluation	Composition of evaluators: Usually, by whom is your teaching (or academic research) evaluated?	Multiple choices: administrative evaluation (leaders of the department and university-level management staff), evaluation of academic peers (including those of the department and outside the university), and evaluation of students (only including students)
		Decision-making power of evaluators: In your university, who have the largest influence on the teaching evaluation (or academic research evaluation)?	Single choice: the government or outside stakeholders, university-level heads, department heads, committees (academic committee and professors' committee), teachers, students
	Actual weight in promotion	In your university, what role does academic research (or teaching) play in teachers' promotion?	Likert scale (1 = completely unimportant, 5 = very important), a larger score means a larger weight
	Due weight in promotion	In your university, how much importance should be given to academic research (or teaching)?	
	Predictive effect on salary	Input of time in teaching, academic research, and teachers' salary	Teachers share their post-tax income of the previous year (including subsidies) and subsidies coming from the university excluding their basic salary
Time input	Teaching	Weekly teaching time if there is a teaching task	The report of teachers
	Academic research	Weekly research time if there is a teaching task	
Education quality	Education quality	In the past 5 years, how was the education quality of your university improved?	Likert scale (1 = clearly deteriorated, 5 = greatly improved)
Sense of belonging to the university	Sense of belonging to the university	How important is the sense of belonging to your department (and university) to you?	Likert scale (1 = unimportant, 5 = very important), the sense of belonging to a university is equal to the average of the sense of belonging to a department and that to the school itself
Controlled variables	Demographical variables	Sex	Mute variable: male = 0, female = 1
		Age	Continuous variable
		Professional title	Teaching assistant = 1, lecturer/research assistant = 2, assistant professor/assistant researcher = 3, professor/researcher = 4
	Features of universities	Research universities	Non-research university = 0, research university = 1
	Human capital	Highest education	Bachelor or equivalent = 1, master or equivalent = 2, doctor or equivalent = 3
		Training as a teacher	Likert scale (1 = very poor, 5 = very good), a larger score means stronger training
		Training as a researcher	
	Types of subjects	Humanities	Mute score, based on engineering
		Social sciences	
Science			

once again indicates that the evaluation subject of academic research is more superior and influential.

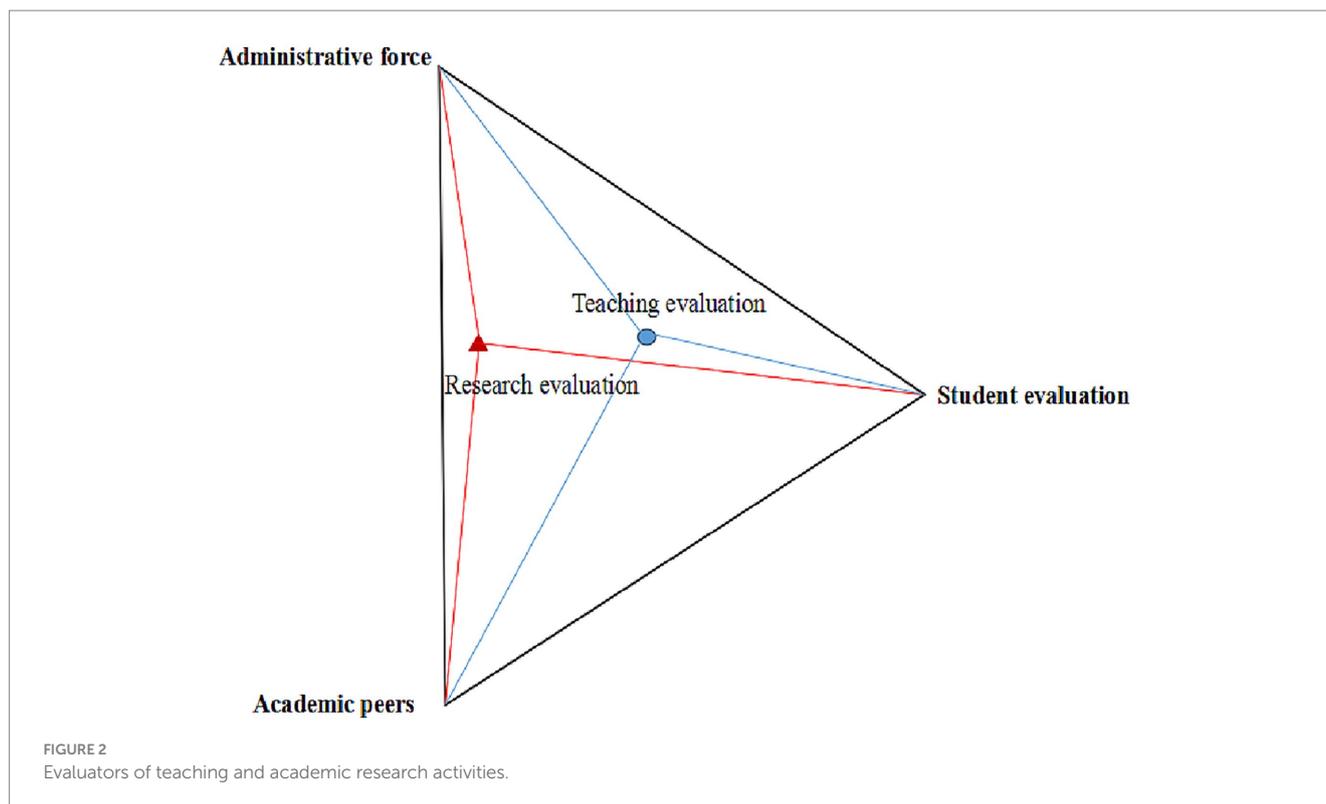
Such imbalance in the evaluation of teaching and academic research has made teachers feel that teaching is a “conscientious job.” In the interview, many teachers explained the true connotation of “conscience”: because teaching is a conscientious job, they must obey professional ethics and disciplines and could not bear to do a poor job. According to Dragon, “a teacher should teach what he or she is supposed to teach and at least cannot mislead the students.” The listeners of teachers are innocent students, so they are flexible in deciding their teaching input and there are indeed some teachers who are careless about teaching. According to Lion, “you will know what you should do when you are conscientious.” Lion often tutors his students and talks with them, yet “my co-workers think that I am wasting time and

doing “useless work.” They say that I should better spend the time on research.”

The above results indicate that from the perspective of the evaluation subject, the evaluation subject of academic research is mainly administrative leadership, which has greater power and greater influence on the career of teachers, while the evaluation subject of teaching is mainly the student group, which has weaker discourse power and influence.

4.2 The weight of teaching and research in promotion

Teachers generally believe that teaching and research should have similar weights, with teaching even slightly higher than research



(Teaching 4.5, Research 4.41). It was found that as the selection of universities improves, teachers tend to have higher research weight and lower teaching weight, but the difference is not significant. However, in actual promotion assessments, the importance of teaching (3.47) is significantly lower than the importance of academic research (4.63), and reaches a significant level of $p=0.001$. This pattern is stable in various types of universities (as shown in Figure 3).

In order to clearly reflect the imbalance between teaching and academic research in promotion evaluation, two imbalance indicators are constructed:

Imbalance of teaching = actual weight of teaching - due weight of teaching.

Imbalance of research = actual weight of research - due weight of research.

A positive imbalance indicator indicates that the activity is more valued, while a negative indicator indicates that it is being underestimated. The absolute value of the imbalance indicator reflects the degree of imbalance, and the difference between the two imbalance indicators further highlights the weight difference between teaching and research activities. Analyzing the types of teacher professional titles, the results show that at different stages of professional titles, university teachers believe that teaching has not been given the necessary attention in the evaluation system. However, compared to novice academic workers who have not yet fully entered the academic labor market and teachers with senior professional titles who are no longer worried about promotion, lecturers and associate professors in the upward phase of career

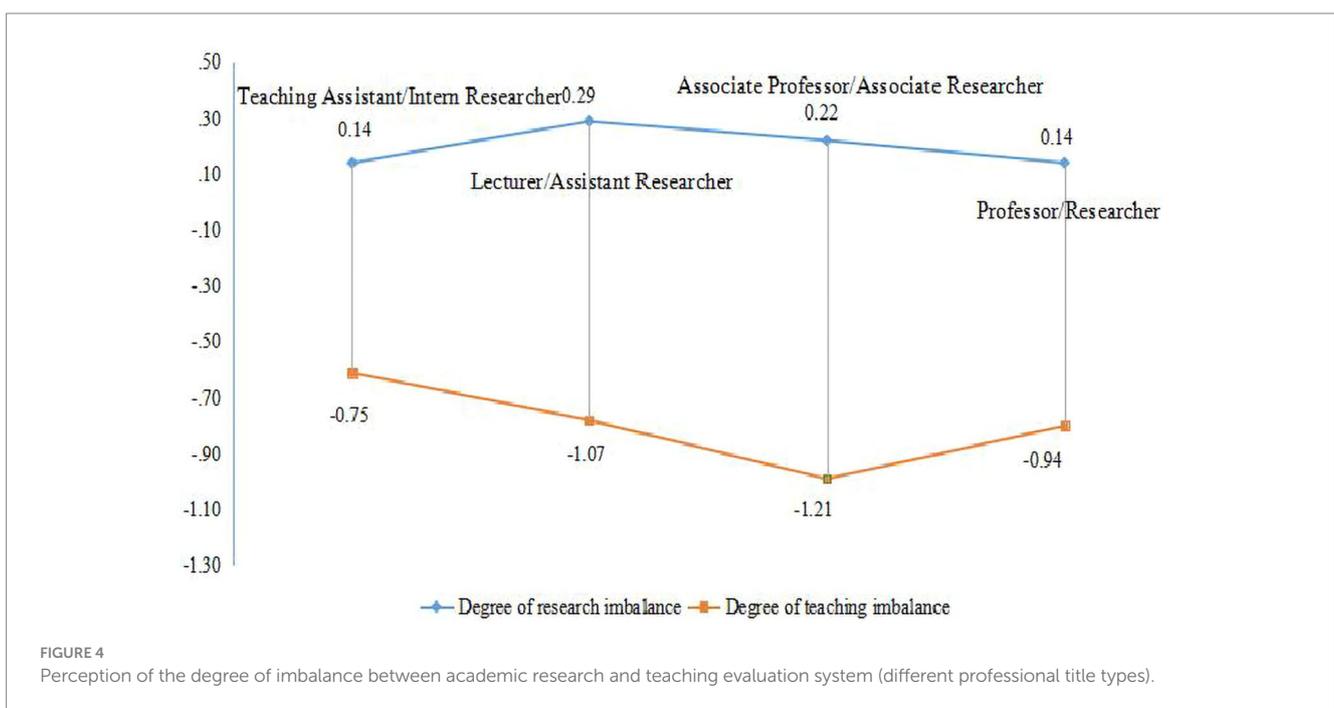
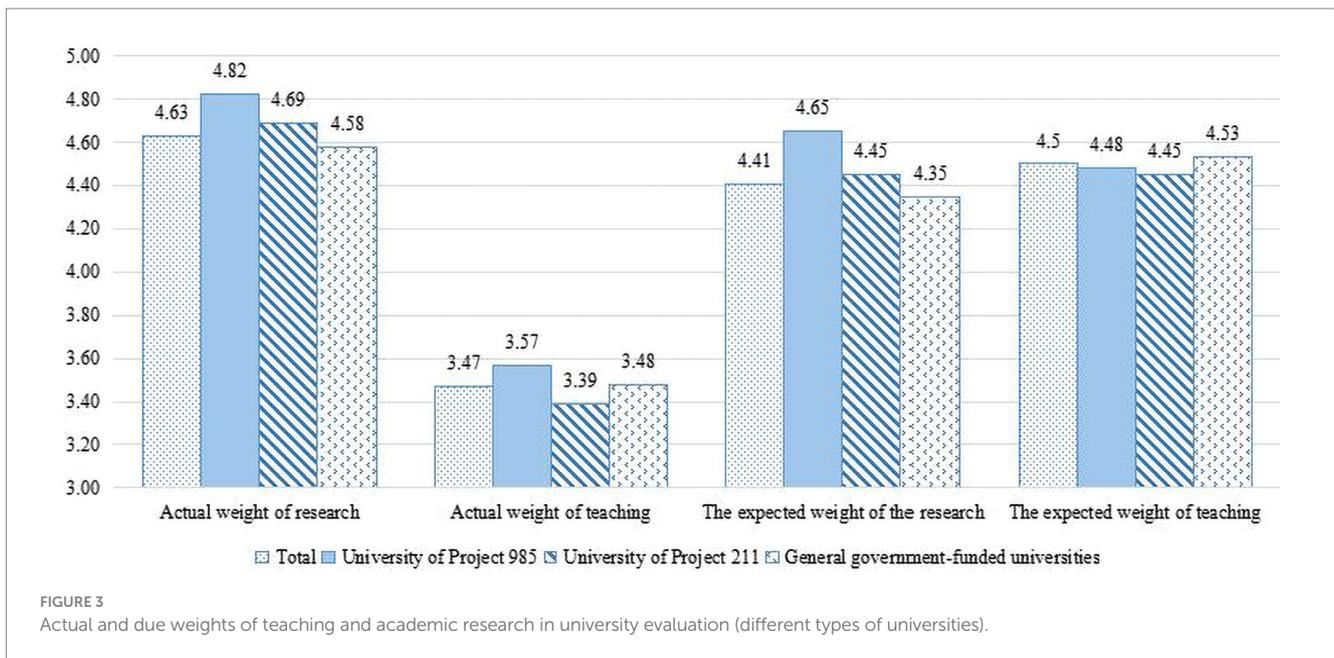
development are more deeply aware of the imbalance between the two, as shown in Figure 4.

The above results indicate that teachers have perceived the imbalance between teaching and academic research, with academic research receiving more attention and teaching not receiving due attention.

4.3 The role of teaching and research in salary acquisition

Chinese teachers not only have to strive for promotion, but also worry about their income. If the evaluation system for teaching and research is equivalent and balanced, then time investment in teaching and research should have a positive and equal predictive effect on salary. We can verify this hypothesis through linear regression.

The regression results (see Table 4) show that the model has good explanation from the adjusted R square, indicating that the independent variable has good predictive performance. The regression model shows that in terms of total income acquisition, women are lower than men, and research universities are better than non-research universities. At the same time, as age increases, the highest education level and professional title increase, total income increases. Similarly, among the income from universities (including fixed salaries and allowances), research-oriented university teachers have higher income, and the positive effect of professional titles and educational qualifications is still significant. The above conclusion is consistent with both daily experience and the basic viewpoint of human capital theory, that the long-term academic accumulation and professional training of academic professionals can indeed effectively predict their income.



The regression results (see Table 4) show that the investment in teaching time has a negative effect on the total income (coefficient is -0.062). If 1 h of teaching is added per week, the annual income will decrease by 620 yuan. The investment in teaching time also has a negative impact on the income from universities. If 1 h of teaching is added per week, the annual income from universities will decrease by 420 yuan. In contrast, the investment in academic research time has a positive impact on both the total income and the income of some universities. By investing an additional hour of academic research per week, the annual income and income from universities increased by 410 yuan and 540 yuan respectively, and reached a significant level.

The above results indicate that **input in academic research can bring more substantial income**, while input in teaching has a negative impact on the salary. The investment in academic research can bring about richer income, and the reasons behind this phenomenon can be more fully explained through qualitative interview data. **Firstly, compared to teaching investment, the research results brought about by the same investment have a higher weight in reward performance.** Based on the author's work experience, among the performance reward distribution in the end of the year for university teachers, teaching performance rewards are hundreds or thousands of yuan while academic research performance rewards are mostly thousands of yuan or tens of thousands of yuan.

TABLE 4 The impact of investment in teaching time and research time on income.

	Total income		Income from universities	
	coefficient	p-value	coefficient	P-value
Gender (male=0)	-0.044	0.055*	-0.047	0.038**
Age	0.150	0.000***	0.102	0.001***
Research university (No=0)	0.047	0.044**	0.053	0.021**
Humanities	0.048	0.054	0.015	0.544
Social sciences	0.135	0.000***	0.085	0.001***
Science	0.037	0.129	0.017	0.483
Title	0.234	0.000***	0.254	0.000***
The highest education level	0.065	0.011**	0.104	0.000***
Teaching training	0.013	0.620	0.001	0.973
Research training	0.003	0.923	0.013	0.616
Teaching time	-0.062	0.005**	-0.045	0.042**
Research time	0.041	0.080*	0.054	0.022**
R square	0.480		0.475	
Adjusted R-square	0.474		0.460	
F value	30.733***		30.000***	

*** $p < 0.001$; ** $p < 0.05$; * $p < 0.1$.

Teacher KUN's statement is highly representative: "Everyone teaches basically in the same way. There is no way to decide which one teaches better, as long as you finish the teaching task. But when you publish a high-quality paper or an unqualified paper, the performance score will be different, directly affecting performance rewards." Teacher BEAUTY bluntly said: "There is a reward for academic research publication, which is according to an explicit policy. Academic research is more valuable. This is a tacit rule in the academic community." Teacher MONTAIN explained the role of teaching and research: "Teachers who achieve the same academic research outcomes, with good and bad teaching, such as the top 10% and bottom 10% of teachers in student evaluation, may not have a substantial difference in performance. It is possible that when evaluating awards or professional titles, teachers with good teaching performance will take the lead, while those with poor teaching performance will not have an advantage. However, when two teachers perform the same in teaching, yet with different research outcomes, their salaries will differ vastly." **Secondly, there is a significant component in academic research activities, which is "the combination of industry, academia, and research." The research topics in academic research can bring more economic benefits.** Teacher MONTAIN pointed out that many teachers around him often "go to the scene" (do research projects), when it comes to academic research, the motivation to run is relatively strong. To put it bluntly, in terms of income, academic research is stronger than teaching. Whether it is a horizontal or vertical project, it is definitely much stronger than teaching. **Finally, research investment can bring higher social and academic influence, and other income will also come in droves.** During the interview process, teachers frequently mentioned the term "circle." "Circle" is not a geographical or spatial definition, but a discipline or professional field definition. When a university teacher talks about their own "circle," they refer not to their own university or department, but to the "circle" formed by their

peers and academic workers in the same field (which is also consistent with the first part of the research results). Although the 'circle' is intangible, its impact is real. Teacher LION said, "The impact of academic research on you personally, your position in the 'circle', your application for awards and projects, your publication, and even giving lectures and classes are all positive." Teacher KUN admitted that even if you receive a tenured teaching position, you will still prioritize academic research because the title of a full professor reflects the value of academic research in the academic community. Teacher DRAGON unabashedly describes academic research as a "private job," while teaching belongs to the "public sector." He explains, "If academic research is done well, people will invite you and offer job opportunities for you everywhere. For us, teaching is crowding out academic research because teaching has no benefits, and academic research is profitable, and unprofitable work will squeeze out profitable work."

4.4 The impact of unbalanced evaluation system on the quality of higher education

The above research results show that teaching and academic research are imbalanced in the current evaluation system. From the perspective of the evaluation subject, academic research evaluation is more superior and closer to administrative and academic power. In terms of their impact on teacher promotion and income, the effectiveness of academic research is also more obvious. An imbalanced evaluation system will inevitably lead to corresponding changes in teachers' role cognition, teaching and research attitudes, and behavioral patterns, thereby affecting the quality of education in universities.

In this study, approximately 26.4% of the nearly 2,500 teachers in the survey gave a negative evaluation of the education quality of their university (with 2.2% showing significant deterioration, 6.6% showing

slight deterioration, and 17.6% showing no improvement), and 73.6% gave a positive evaluation (with 64.9% believing in some improvement and 8.8% believing in significant improvement). Based on the analysis in section 4.2 of this study, an indicator for the degree of emphasis on research over education is constructed to:

The indicator for universities to prioritize research over teaching = (actual weight of academic research – due weight of academic research) – (actual weight of teaching – due weight of teaching).

The regression results (see Table 5) show that female teachers and teachers who teach humanities have a more positive evaluation of the improvement of educational quality in their respective universities, and the teaching and research training received by teachers is beneficial for the improvement of educational quality in the universities. After controlling for demographic variables and human capital variables of teachers, as well as the characteristics of universities and disciplines, the improvement of education quality in universities was predicted through the indicator of emphasizing research over teaching. The results showed that the stronger the degree of emphasis on research over teaching perceived by teachers, the less conducive it is to the improvement of education quality in their respective universities.

4.5 The moderating effect of the sense of belonging in universities on the impact of imbalanced evaluation systems on the quality of higher education

According to Clark Burton's discussion in *The Higher Education System: Academic Organization in Cross-National Perspective*, disciplines and institutions collectively constitute academic organizations, and university teachers are embedded in a “matrix structure,” with interdisciplinary and institutional interactions. Although the main force that dominates the work and life of university teachers lies in the discipline, as one of the baselines in the matrix structure, universities also have a constraining effect on teachers. Based on the qualitative interview materials in section 4.3 of this study, we noticed that some teachers reported that academic research belongs to “private work” and teaching belongs to “public work.” This argument actually reflects the struggle between a sense of disciplinary belonging and a sense of academic belonging. Considering the national conditions of China, public universities have historically belonged to public institutions, and teachers were “personnel of government agencies and units” with supporting “authorized size” and benefits. Leaving the university where university teachers are located is no less costly or easier than leaving their professional field. Therefore, we will explore how the sense of belonging in universities can alleviate the negative impact of the imbalanced price system on the quality of higher education.

The core independent variable of emphasizing research over education indicators and the moderating variable of sense of belonging to universities are both continuous variables in this study. In order to eliminate the collinearity effect, the two variables were centralized, and then the moderating variable and interaction term were included for stratified linear regression. The results show (see Table 6) that after

TABLE 5 Impact of the evaluation system of prioritizing academic research over teaching on improving the quality of higher education.

	Improvement of higher education	
	Coefficient	P-value
Gender (male=0)	0.068	0.003**
Age	−0.003	0.930
Research university (No=0)	0.019	0.419
Humanities	0.055	0.030**
Social sciences	0.040	0.116
Science	−0.030	0.228
Title	−0.003	0.937
The highest education level	−0.014	0.575
Teaching training	0.100	0.000***
Research training	0.065	0.015**
Emphasize research over education	−0.201	0.000***
R square	0.474	
Adjusted R-square	0.469	
F value	13.168***	

*** $p < 0.001$; ** $p < 0.05$; * $p < 0.1$.

including the sense of belonging of university teachers, the negative main effect of emphasizing research over teaching remains significant, and the positive main effect of sense of belonging of university is significant. The interaction between the two reaches a negative significance level, that is, the sense of belonging of teachers can effectively weaken the adverse impact of the evaluation system of emphasizing research over teaching on education quality.

With the continuous disintegration of the unit system, the continuous reform of the personnel system, and the gradual enhancement of incentive measures in the teacher evaluation system, the traditional “mentality of unit” of teachers has melted away, and the employment relationship between universities and teachers is becoming increasingly apparent. Can the sense of belonging of universities continue to play a stable regulatory role in various age groups of teachers? To verify this issue, this study distinguished the samples. According to the age group of teachers, it is divided into four sub samples, namely the group of teachers under 30 years old (inclusive), the group between 31 and 40 years old (inclusive), the group between 41 and 50 years old (inclusive), and the group over 51 years old. The regression results indicate that the main effect of valuing research over teaching has reached a significant level among teachers of all age groups, both of which inhibit the improvement of higher education quality. The main effect of the sense of belonging to universities on the improvement of education quality is only reflected in the age groups of 31–40 and 41–50. It is worth noting that the moderating effect of the sense of belonging to universities disappears in the group of young teachers under 40 years old, and the sense of belonging to universities cannot weaken the negative effects brought by the evaluation system of emphasizing research over teaching.

TABLE 6 Analysis of the moderation effect of the sense of belonging to a university (by age group).

The impact of prioritizing academic research over teaching evaluation system on improving the quality of higher education										
	Full sample		Under 30 years old		31–40 years old		41–50 years old		Over 51 years old	
Gender (male=0)	0.059	**	0.071		0.076	**	0.051		0.099	
Age	0.003		−0.11		−0.011		0.076		−0.124	
Research university (No=0)	0.012		0.008		−0.002		0.014		0.012	
Humanities	0.060	**	0.002		0.023		0.146	**	0.154	
Social sciences	0.044	*	−0.003		0.005		0.101	*	0.328	**
Science	−0.022		−0.012		−0.044		0.004		−0.029	
Title	−0.009		−0.016		−0.010		0.001		−0.051	
Highest degree	−0.017		−0.019		0.033		−0.050		−0.026	
Teaching training	0.088	***	0.036		0.115	***	0.069		−0.122	
Research training	0.052	*	0.126	*	0.058	*	0.011		−0.029	
Prioritize research over education	−0.198	***	−0.105	*	−0.189	***	−0.157	***	−0.480	***
Sense of belonging to a university	0.144	***	0.101		0.165	***	0.111	**	0.051	
A sense of belonging to a university * prioritize research over education	−0.070	***	−0.03		−0.048		−0.144	***	−0.262	**
R square	0.498		0.477		0.455		0.499		0.483	
Adjusted R-square	0.491		0.429		0.403		0.472		0.334	
F value	14.792***		1.594***		10.004***		3.652***		3.236***	

*** $p < 0.001$; ** $p < 0.05$; * $p < 0.1$.

5 Conclusion and discussion

5.1 Research conclusions

This study deconstructs the evaluation system of current university teachers, and it can be seen that the evaluation subjects of academic research activities are mainly administrative leaders and academic peers. The rank of the evaluation subject is high and the power is large, while the radiation range of teaching activities is narrow, and the evaluation subject is mainly the student group. Compared to academic research activities, teachers generally believe that teaching activities have not received the appropriate weight in promotion, and those facing greater promotion pressure (such as lecturers being promoted to associate professors, associate professors being promoted to full professors) have a deeper feeling of this imbalance. Moreover, compared to the positive predictive effect of academic research activities on salary, teaching activities have a negative inhibitory effect on salary acquisition. Combined with interview information with university teachers, the “hard currency” attribute of academic research is stronger, and academic research activities can bring dual rewards for teachers in terms of material and

academic power status. It is precisely for this reason that academic research activities are placed at the center of the evaluation system.

The results of this study indicate that it is an undeniable fact that universities prioritize research over teaching. However, the consequences of this imbalanced evaluation system are negative, and the neglect of teaching can hinder the development and improvement of education quality in universities. Faced with this dilemma, this study suggests that the positive role of teachers’ sense of belonging can be verified from the perspective of the interdisciplinary and overlapping nature of academic identity between disciplines and universities. The results indicate that the sense of belonging to universities can indeed improve the quality of education in universities, and as a moderating variable, it can effectively suppress the negative effects of the evaluation system of emphasizing research over teaching.

5.2 Research discussion

Firstly, it needs to be acknowledged that the current evaluation system is imbalanced. The mission of universities is to explore science

and cultivate individuality and morality - from science to moral cultivation. In the practice of scientific exploration, teachers and students form an academic community, and teachers guide students to carry out academic research work, achieving the unity of the two. Traditional wisdom or beliefs also believe that teaching and research are like two sides of a coin, and this belief carries a religious conviction. However, empirical research shows that the current evaluation system's preference for academic research has led to the marginalization of teaching, and various types of universities have not adjusted the weight of teaching and research in the evaluation system based on their own development strategic goals, school tasks, educational conditions, and resource constraints, resulting emphasis on research over teaching in most universities. **Similarly, it needs to be acknowledged that emphasizing research over teaching is a "rational choice" for teachers under an imbalanced evaluation system.** In recent years, with the increasing awareness of public accountability, university teachers have been frequently portrayed as "irresponsible researchers." But in response to this criticism, the responsibility cannot be entirely shifted to individual teachers, and it is necessary to see the background in which they are in. Although the academic profession has stronger spiritual pursuits, spiritual pursuits rely on material foundations, and the unity of spirituality and materiality is the unity of human nature, academic people, and rational people, which is the teacher. The pursuit of material benefits by teachers is not only related to the increasingly harsh employment environment of academic professions, but also reinforced by new management principles. The infiltration of market logic has made the relationship between universities and teachers increasingly tense, especially after the implementation of the "non- promotion or departure" personnel system reform, the stable relationship that previously relied on the "unit" binding no longer exists. The collaborator status of teachers has gradually been weakened, and the worker status has been emphasized. The combination of market logic and academic logic has triggered a revolution in academic career management. Universities are increasingly based on market mechanisms and operate according to market competition rules and industry logic. Efficiency and responsibility have become the value pursuit of universities, and performance indicators and quality control have become the management methods of academic careers. According to the multitasking model, when faced with various indicators, teachers naturally devote more energy to academic research which is easily overserved and neglect teaching. **The imbalanced evaluation system is extremely unfavorable for the development and improvement of the quality of higher education.** From the perspective of the development law of knowledge, academic research is the way for universities to pursue truth, but the prerequisite for pursuing truth is to inherit truth. Teaching work has a foundation and priority, and research work cannot be separated from teaching. At the same time, academic research content is forward-looking and can feed back teaching, producing a "overflow effect." In the evaluation system, considering one aspect and losing the other, favoring one aspect over the other, is detrimental to the long-term talent cultivation and knowledge exploration of universities.

A breakthrough point of this study is to point out ways to weaken the negative effects of the imbalanced evaluation system, that is, to enhance teachers' sense of belonging to the university or institution. University teachers, as academic workers, have a dual identity commitment and loyalty. On the one hand, they are loyal to the discipline they belong to, and on the other hand, they are loyal to their

own institution. The sense of belonging to an institution can be simply understood as an emotion of being supported, cared for, accepted, and respected. When teachers have a common understanding of the attached institution and develop common emotions with their colleagues and students around them, this belief in "us" helps university teachers contribute more time and energy to the institution. "The community of institutions, like the community of professions, plays an important role.... It is the source of the healthy development of the institution." In view of this, on the one hand, it is necessary to balance the weight of teaching and research in the evaluation system, respect the autonomy of employers, classify and evaluate university teachers based on the quality of education, develop evaluation standards that focus on different aspects, broaden the scope of evaluation content, and enhance the weight of teaching evaluation. On the other hand, it is necessary to explore more practical and feasible plans to enhance the sense of belonging of universities, provide guidance and scientific basis for university practice, and weaken the adverse consequences brought by the imbalanced evaluation system.

This study also found heterogeneity in the role of the sense of belonging of universities in different age groups, and the interpretation of this result can be interpreted from two aspects. On the one hand, the professional pressure of university teachers fluctuates with age. Young teachers before the age of 40 are in a period of high pressure, with their economic pressure, teaching pressure, and research pressure reaching their peak. Survival under heavy pressure is the first priority, and teachers' behavior is more based on "rational human" considerations and risk avoidance. Faced with the single and inelastic behavior mode of the external evaluation system, the effectiveness of the sense of belonging of universities is weakened, Unable to play its due role. After the age of 40, the professional pressure of teachers has slowed down, and they have gained a certain degree of disciplinary recognition, discourse power, and academic survival space. The sense of organizational belonging from universities and academic peers' disciplinary belonging are intertwined, causing them to struggle in the "conscience work" of teaching and the "hard currency" of academic research. At this time, the sense of institutional belonging can best play its regulatory role. On the other hand, university teachers of different age groups face different personnel system environments. Compared with the new generation of teachers, teachers over the age of 40 mostly belong to the old system of the personnel system, which is a typical "person of unit." Their long-term work experience in universities has also accumulated a richer sense of belonging to the department. However, young teachers under the age of 40 have a shorter tenure and face the assessment system which has a performance-oriented of "exit without publishing a paper" regulation, greatly weakening the sense of belonging to the university.

There is still room for improvement in this study, and further exploration will be conducted in the following areas: (1) Provide solutions for policy formulation and specific practical operations based on empirical data. This study has shown that enhancing the sense of belonging of university teachers can enhance their teaching performance, alleviate the negative consequences of prioritizing academic research over teaching. Then, researchers and administrators need to jointly resolve such issues as how to adjust and improve the academic and professional system of universities, and how to create an organizational culture with a strong sense of belonging, support, and trust, so as to form a favorable institutional environment that facilitates the development of teachers (2) Underexplored Impact of External Factors: The role of external factors, such as funding

pressures, publication metrics, and social expectations for research output, is not thoroughly examined in the discussion. These factors significantly affect university priorities and cultural behavior, and their impact should be more fully explored. (3) The data used in the study are all from surveys on teachers. There is limited discussion on how these impacts affect student learning outcomes and experiences. Integrating student-centered perspectives would offer a more subjective view of the issue.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Author contributions

X-WW: Funding acquisition, Investigation, Methodology, Writing – original draft. Y-CZ: Conceptualization, Formal analysis, Funding acquisition, Writing – review & editing. QD: Data curation, Investigation, Software, Writing – original draft.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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