



Research on the Construction of an Indicator System for the Academic Career Development of University Faculty

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Abstract. The academic career development of university teachers is a comprehensive concept. Pushing it towards a higher level and deeper connotation of development is not only an innovation to the traditional academic evaluation system but also a profound reflection and reconstruction of the long-term development path of academia. This research transcends the limitations of traditional single evaluation criteria based solely on scientific research and teaching achievements, and pays more attention to diversified indicators that can profoundly reflect teachers' inner experiences. Based on the review of existing literature, an evaluation index system for the academic career development of university teachers was finally constructed through two rounds of Delphi expert consultation.

Keywords: University teachers, academic career development, index system.

1 Introduction

Academic career development is a rich and comprehensive concept that essentially represents the process of academics, who view academia as their vocation, enhancing their academic productivity. It involves continuous adaptation and deep integration among their professional identity, mindset, behavior, and organizational requirements. The metrics for measuring academic career development encompass two main aspects: the combination of quantitative and qualitative aspects of the individual's current development status, and the unity of abilities and skills conducive to future growth. However, current evaluation indicators for university teachers' career development tend to overly emphasize external manifestations, making it difficult to reasonably assess teachers' true capabilities, development potential, and unique strengths. There is a pressing need for reforming the evaluation system for university teachers, exploring the development system construction from the perspectives of responsibility, competence, and effectiveness^[1], in order to strengthen its incentivizing effects.

2 Theoretical Construction of Academic Career Development

This study will delve into the specific indicators of academic career development for university teachers from three dimensions: academic career achievements, academic

career competencies, and academic career identity. By precisely grasping the direction and standards of their academic career development, we can more effectively facilitate their professional growth and academic advancement.

Dimension of Academic Career Achievements. The achievements that teachers attain in their academic careers encompass not only quantifiable indicators such as research grant applications, publication of academic outcomes, research collaborations and exchanges, management, and service^[2], but also metrics that signify the increase in individual academic resources, including enhanced academic reputation, increased economic income, and promotions in professional titles^[3]. While intangible accomplishments like intrinsic feelings of accomplishment, self-actualization, and one's status and value within the academic community play a vital role in personal career development and spiritual fulfillment, they are often challenging to quantify precisely like extrinsic achievements. Therefore, this study categorizes the academic career achievements of university teachers into extrinsic and explicit achievements, and intrinsic and implicit achievements.

Dimension of Academic Career Competencies. Teaching development has always held a significant position in the career of teachers, and teaching academic competencies primarily explore the capability elements required in the implementation of teaching from a practical operational perspective. Academic research capabilities, on the other hand, focus on optimizing existing knowledge systems and maintaining a leading level of discipline expertise through learning, practice, and reflection, encompassing critical skills such as innovation, criticism, evaluation, and expression. Scholars like Barnes have identified academic career competencies as encompassing three dimensions: reflective, communication, and behavioral competencies, while further elaborating on the specific competency indicators within each dimension^[4]. This study integrates reflective competencies and behavioral competencies, summarizing them as reflective and behavioral competencies.

Dimension of Academic Career Identity. This dimension primarily explores the subjective significance of development, emphasizing that teacher development research should be oriented towards the spiritual growth and physical-mental harmony of teachers^[5]. Building upon existing research on academic career identity, this study formulates indicators representing academic career identity by referring to the definitions and scales established by scholars. The dimensions of identity and value identity primarily draw on Li Xiaoying's^[6] scales related to a sense of belonging and values. The dimension of academic career behavioral tendencies mainly refers to the Teacher Professional Identity Scale developed by Wei Shuhua et al. Additionally, the Job Satisfaction Scale developed by Greenhaus et al. was also referenced^[7].

3 Delphi Method for Constructing the Indicator System

3.1 Introduction to Delphi Method

Using the Delphi expert consultation method, this study aims to develop indicators for academic career development. During the process, experts were selected for two rounds of review. Their enthusiasm was assessed through questionnaire response rates, and

their authority was measured using self-assessment sections in the questionnaires. The importance scores of each indicator were determined based on expert evaluations to select and discard indicators. Additionally, the mean and standard deviation of importance scores were used to quantify the differences in opinions among experts regarding the indicators. After the first round of review, the constructed indicators were adjusted and refined based on the collected quantitative data and experts' free comments. Following two rounds of consultation, the final indicator system for academic career development was established.

3.2 Consultation Process and Initial Judgement of Indicators

The study selected experts with certain authority in the field of higher education research, particularly in teacher development and academic career development. The primary method used was "subjective sampling," supplemented by "snowball sampling." Table 1 presents the basic information of the experts consulted in the two rounds.

Table 1. Basic Information of Consulted Experts in Two Rounds.

Category		First Round		Second Round	
		Frequency	%	Frequency	%
Gender	Male	12	60	12	66.7
	Female	8	40	6	33.3
Professional Title	Senior	16	80	9	50
	Associate Senior	4	20	9	50
Age	36-40	4	20	9	50
	41-45	2	10	3	16.7
	46-50	4	20	1	5.6
	51-55	5	25	4	22.2
	56+	5	25	1	5.6
	6-10Years	5	25	9	50
University Work Experience	11-15Years	3	15	2	11.1
	16-20Years	2	10	3	16.7
	20-30Years	5	25	3	16.7
	30+Years	5	25	1	5.6
	Very Familiar	5	25	3	16.7
Self-Assessment of Familiarity with the Field	Relatively Familiar	9	45	12	66.7
	Moderately Familiar	5	25	3	16.7
	Somewhat Unfamiliar	1	5	0	0
	Very Unfamiliar	0	0	0	0
	Mean Score	3.9		4.0	

The data indicates that the experts demonstrated high enthusiasm and authority, as well as a strong familiarity and expertise in their fields.

3.3 Indicator Modification

The selection of indicators is primarily based on the importance and diversity evaluated by experts. The importance is directly calculated as the average score given by experts, while diversity is reflected through the coefficient of variation and the degree of consensus. In this study, the screening criteria are set as the average importance score

greater than 4, the coefficient of variation(CV) less than 25%, and the degree of consensus(DC) not less than 70%. Additionally, with reference to the textual opinions of experts, adjustments to the indicators, including additions, deletions, and modifications, are made accordingly.

Table 2. Analysis Results of First-round Expert Consultation on Level 1 and 2 Indicators.

Level 1 Indicator	M	SD	CV	DC	Level 2 Indicator	M	SD	CV	DC
Academic Career Achievement	4.43	0.46	0.10	80%	Explicit Achievements	4.34	0.60	0.14	75%
					Implicit Achievements	4.52	0.43	0.09	95%
					Teaching and Academic Competence	4.23	0.57	0.13	75%
Academic Career Competence	4.34	0.40	0.09	80%	Academic Research Competence	4.55	0.34	0.07	95%
					Reflection and Behavioral Competence	4.25	0.57	0.13	75%
					Identity with Academic Career	4.30	0.36	0.08	90%
Academic Career Identity	4.39	0.36	0.08	95%	Value Identification with Academic Career	4.46	0.44	0.10	95%
					Behavioral Tendency in Academic Career	4.40	0.45	0.10	90%

The results of the first round of expert consultation are shown in Tables 2 and 3. The average values of the three first-level indicators are all greater than 4, and the coefficients of variation are all no more than 0.1, which meet the consistency test criteria in the Delphi study. The lowest expert consensus is 80%, indicating that the experts have reached a strong consensus on the first-level indicators. The average values of the eight second-level indicators are all above 4, with coefficients of variation ranging from 0.07 to 0.14, far less than 0.5, and the lowest expert consensus is 75%, indicating that the experts have reached a strong consensus on the second-level indicators. Among the 35 third-level indicators, except for the number of patents and software copyrights, the average scores of the importance of the remaining indicators are all greater than 4, with coefficients of variation less than 0.25 and consensus rate (CR) not lower than 70%.

Table 3. Analysis Results of Third-Level Indicators from the First Round of Expert Consultation.

First-Level Indicator	Second-Level Indicator	Third-Level Indicator	M	SD	CV	CR		
1. Academic Career Achievement	(1) Explicit Achievements	Number of Publications in High-Quality Journals	4.80	0.52	0.11	95%		
		Number of Provincial and Ministerial Level or Higher Research Projects Led	4.60	0.60	0.13	95%		
		High-Level Teaching and Research Awards	4.70	0.57	0.12	95%		
		Number of Monographs and Textbooks	4.05	0.94	0.23	80%		
		Number of Patents and Software Copyrights	3.55	1.00	0.28	40%		
	(2) Implicit Achievements	Social Status of University Teachers	4.40	0.60	0.14	95%		
		Professional Fulfillment of University Teachers	4.55	0.51	0.11	100%		
		Sense of Realization of Life Value	4.60	0.50	0.11	100%		
		2. Academic Professional	(3) Teaching and Scholarly Competence	Knowledge Mastery and Integration Ability in Teaching	4.35	0.59	0.13	95%

Competence	Teaching Design and Curriculum Development Ability		4.25	0.64	0.15	90%	
	Interactive Ability in Teaching Process		4.20	0.62	0.15	90%	
	Teaching Method Innovation Ability		4.05	0.89	0.22	75%	
	Teaching Reform Exploration Ability		4.30	0.66	0.15	90%	
	Knowledge Learning and Application Ability		4.70	0.47	0.10	100%	
	Independent Research Ability		4.80	0.41	0.09	100%	
	Theoretical and Methodological Innovation Ability		4.65	0.59	0.13	95%	
	(4) Academic	Ability					
	Research Competence	Academic Criticism and Skepticism		4.65	0.49	0.11	100%
		Academic Evaluation Ability		4.15	0.67	0.16	85%
Scientific Research Cooperation Ability		4.15	0.88	0.21	70%		
Academic Expression Ability		4.75	0.44	0.09	100%		
Self-Analysis Ability		4.25	0.64	0.15	90%		
(5) Reflection and Behavioral Competence	Goal-Oriented Ability		4.25	0.72	0.17	85%	
	Opportunity Seeking Ability		4.50	0.61	0.13	95%	
	Opportunity Seeking Ability		4.15	0.75	0.18	80%	
	Strategic Adjustment Ability		4.10	0.85	0.21	80%	
3. Academic Career Identity	(6) Identity of Academic Career Status	Identity as a University Teacher	4.45	0.51	0.11	100%	
		Sense of Belonging to the University	4.00	0.65	0.16	90%	
		Ethical Identity in Academic Profession	4.45	0.60	0.14	95%	
	(7) Identity of Academic Career Values	Recognition of the Importance of the Profession		4.30	0.57	0.13	95%
		Recognition of the Value of One's Own Work		4.70	0.47	0.10	100%
		Professional Happiness of University Teachers		4.45	0.60	0.14	95%
		Professional Pride of University Teachers		4.40	0.68	0.15	90%
	(8) Behavioral Tendencies in Academic Career	Interest in Academic Work		4.55	0.60	0.13	95%
		Passion for Academic Work		4.45	0.60	0.14	95%
		Motivation for Academic Research		4.20	0.52	0.12	95%
Total Score			153.45	12.76	0.08		

The results of the first round of expert consultation showed that the average importance scores for both primary and secondary indicators were above 4, leading to the retention of all primary and secondary indicators. Some experts indicated that "reflective and behavioral abilities" were not easy to understand. This ability can be interpreted as the sustainable and high-quality development ability of teachers' academic careers, representing universal and general competencies. Therefore, without affecting the research objectives, this term was renamed "academic development ability." For the third-level indicators, based on their importance and expert analysis, indicators with mean values of importance less than 4 were deleted. Although the indicator "number of patents and software copyrights" had a mean value of importance less than 4 and a relatively large coefficient of variation, indicating significant controversy among experts, it is an important indicator of academic inventions and creations in science and engineering majors, representing teachers' academic transformation and application achievements. After discussion with experts, it was still retained in the indicator system.

Furthermore, based on expert advice, the tertiary indicators under implicit achievements in academic career were revised as follows: Some experts believed that "academic overt achievements should not solely focus on publications, awards, and research projects. In fact, a true scholar cares more about the innovation, discovery, or development of academic theories, and whether they have received recognition and praise from peers." Through breakthroughs and developments in creative achievements, as well as

recognition and praise from peers, teachers can experience intrinsic accomplishment and personal fulfillment, which fully demonstrate their status and value in academia and are crucial for their personal growth and professional satisfaction. After considering expert opinions, the three tertiary indicators were revised to "proposal of academic concepts or terminology," "development of academic viewpoints or theories," and "recognition or praise of academic achievements by peers."

3.4 Indicator Finalization

The second round of survey questionnaires was developed based on the revisions made to the first round of Delphi questionnaires.

In the second round of expert consultation, the mean scores for the importance of first-, second-, and third-level indicators were all greater than 4.06, and the coefficient of variation for all indicators was less than 0.25. It can be seen that after two rounds of expert consultation, the experts' opinions have converged, and they have a high degree of recognition for each indicator. Additionally, based on expert feedback, no indicators with concentrated issues were identified. Therefore, a third round of consultation is not necessary^[8], and the final academic career development evaluation indicator system can be constructed.

Specifically, in terms of the mean scores, the five third-level indicators with the highest importance ratings are: "academic achievements recognized or praised by peers," "independent research capabilities," "theoretical and methodological innovation capabilities," "academic criticism and questioning," and "academic communication and presentation skills." This indicates that peer evaluation plays a vital role in the academic career development of university teachers, suggesting that universities and relevant educational administrative departments should emphasize peer evaluation in the process of teacher evaluation reform and increase its proportion. Regarding the coefficient of variation, the indicators with the lowest values are: "academic achievements recognized or praised by peers," "theoretical and methodological innovation capabilities," "number of publications in high-quality journals," and "recognition of one's own work value." In terms of expert consensus, several indicators such as implicit achievements and academic career value identification achieved a consensus rate of 100%. It is particularly noteworthy that the consensus rate of indicators related to teaching scholarship capabilities, including "instructional design and curriculum development abilities," "interactive abilities in teaching processes," "innovation in teaching methods," and "exploration abilities in teaching reform," decreased significantly in the second round of questionnaires. One possible reason for this is that several young teachers under the age of 40 were included in the second round, who are at the forefront of teacher evaluation reform and have firsthand experience of the university's emphasis on research and de-emphasis on teaching during this process.

The Kendall's coefficient of concordance (W) was calculated separately for the first and second rounds of indicators, and a chi-square test was performed on them. The statistical results showed that the Kendall's W for the third-level indicators were 0.189 and 0.192, respectively. The coefficient value in the second round slightly increased compared to the first round. The chi-square test results were significant at the 0.01 level,

indicating that the research conclusions were statistically significant and the degree of coordination among experts was good. Based on the above comprehensive analysis, the study concludes that the data from the second round of expert surveys are usable, and a third round of surveys is not necessary.

4 Summary

In exploring the connotational dimensions of academic career development for university teachers, current research tends to place greater emphasis on the instrumental value of teachers, primarily focusing on how teachers align with the needs and expectations of organizations or society. Conversely, relatively little attention has been paid to internal factors such as teachers' professional aspirations, personal values, and professional identity. The definition of the connotational dimensions of academic career development for university teachers should be grounded in a more comprehensive perspective, endowing it with deeper significance.

Drawing from various scholars' research, the academic career development of university teachers is regarded as a multidimensional and continuous process. It not only signifies a significant enhancement in teachers' individual academic professional capabilities and growing academic productivity but also represents a crucial journey towards the realization and deepening of their self-worth. Throughout this process, university teachers engage in continuous learning, accumulate academic capital, and integrate knowledge and wisdom through active interactions with international peers and academic environments. Based on their unique individual characteristics, they consciously, proactively, and dynamically plan and construct their own development blueprints, gradually progressing towards a highly specialized role in the teacher community. In this transformation, teachers not only actively construct their internal subjective world, viewing personal development as the core of self-awareness and conscious practice, but also truly become the leaders and practitioners of their own growth. From an evolutionary perspective, the career development of university teachers is a dynamic process that gradually evolves from a natural person to a social being, and from a physical existence to a spiritual, vital, and ethical existence^[9]. Therefore, when considering teachers' career development, it is imperative to transcend the limitations of traditional single-evaluation criteria based solely on research and teaching outcomes, and pay greater attention to diverse indicators that profoundly reflect teachers' inner experiences and professional identity.

Through two rounds of Delphi expert consultations, this study ultimately constructed an academic career development indicator system comprising 3 first-level indicators, 8 second-level indicators, and 35 third-level indicators. It is hoped that the indicator system of this study can provide a strong reference for university administrators, facilitating the academic career development of university teachers and fostering a more outstanding teaching force.

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