

Original Article

Development of a Career Stage-Based Competency Enhancement Roadmap for Faculty Professional Growth: Case Study of University A

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ABSTRACT

Objectives: The purpose of this study was to develop a faculty competency enhancement roadmap that reflects career-stage-specific needs in order to strengthen faculty competitiveness in higher education. **Methods:** Core faculty competencies were identified through a comprehensive literature review and an analysis of the university's talent framework. Faculty development needs were diagnosed using Importance-Performance Analysis (IPA), which examined faculty perceptions of the importance and performance of each competency. The IPA survey was conducted over a two-week period with voluntary participation from full-time faculty members at a four-year university located in the Seoul metropolitan area. Based on the IPA results, a career-stage-based faculty competency roadmap and an institution-level support system were developed. **Results:** The results indicated that understanding of pedagogy was perceived as highly important but insufficiently performed, identifying it as a priority area requiring concentrated improvement. In contrast, understanding of the university's vision demonstrated higher performance than importance and was classified as a possible overinvestment area. Overall, the findings suggest that faculty members across career stages perceive a strong need for competency development, while the level of shared understanding of the university's vision is relatively high. The proposed roadmap emphasizes course design and research expertise development for early-career faculty, student guidance and empathy enhancement for mid-career faculty, and network expansion and contribution to faculty communities for senior faculty. **Conclusions:** This study provides empirical evidence for the systematic development of faculty competencies across career stages and offers a practical roadmap for faculty development. The findings contribute to enhancing faculty professionalism and strengthening educational competitiveness in higher education institutions.

Keywords: Career stage, Competency development roadmap, Faculty competencies, Higher education, Importance-Performance Analysis(IPA)

Received 29 Nov 2025

Revised 19 Dec 2025

Accepted 23 Dec 2025

Citation: Chon EH, Hwang YJ, Jung HJ. Development of a Career Stage-Based Competency Enhancement Roadmap for Faculty Professional Growth: Case Study of University A. The Journal of Transdisciplinary Studies. 2025; 9(3): 149-164. <https://doi.org/10.22685/jts.2025.9.3.149>

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1. Introduction

Introduction The advent of the Fourth Industrial Revolution, coupled with the rapid development of convergence technologies like Artificial Intelligence (AI) and big data, is causing a dramatic shift in the goals and methods of education across society. Higher education is no

exception. Cultivating talent suited to this changing world and providing corresponding curricula have become both a responsibility and a core element determining a university's competitiveness. Consequently, enhancing the quality and innovation of university education is no longer optional but essential. At the national level, various higher education innovation policies are being promoted to keep

pace with this trend. Since 2019, the Korean government has advanced efforts to link faculty expertise and competencies with national quality management systems by mandating faculty competency enhancement programs within the University Innovation Support Project. Universities are actively pursuing educational innovation through self-developed faculty competency diagnosis and certification systems, institutional improvements, curriculum innovation, and increased financial investment.

The most critical factor in guaranteeing the quality of university education is securing outstanding faculty and supporting their systematic competency development. In a rapidly changing educational environment, the faculty role is expanding beyond that of a simple instructor to encompass educator, researcher, organizational member, and internationalization supporter. The demand for corresponding professional expertise has also risen. Recent studies indicate that the scope of faculty competency development has expanded beyond traditional pedagogy to cover the entire faculty role, including research, organizational participation, and the strengthening of medical and educational expertise [1]. This trend suggests that universities must go beyond merely hiring faculty; they must establish customized support systems based on career cycles to institutionally guarantee sustainable professional development.

Examining international cases, the United Kingdom, through the HEFCE (Higher Education Funding Council for England), has set official competency standards for university faculty and institutionalized their development. The United States has established support systems to strengthen faculty's teaching, research, and organizational development through networks like POD (Professional and Organizational Development Network) and ICED (International Consortium for Educational Development). Recent research also emphasizes that a multi-dimensional approach—including mentoring, peer observation, pedagogical workshops, and reflection—is more effective for faculty development than single programs [2]. China is also focusing on qualitative enhancement in higher education by introducing quality-focused instruction [3]. Domestic universities are also operating various faculty competency enhancement programs—such as special lectures on pedagogy, workshops, class filming and analysis, consulting, teaching portfolios, and community-based research groups—primarily led by Centers for Teaching and Learning (CTLs) [4].

However, many existing faculty development programs tend to focus primarily on teaching competencies and have not evolved into systematic, long-term professional development systems grounded in competency roadmaps that take faculty career stages into account. Faculty competencies

can be broadly categorized into teaching and student guidance competencies as educators, research competencies as scholars leading domestic and international research fields, and service competencies as members of the university and the broader community. Faculty members therefore assume not only the role of knowledge transmitters to students but also bear concurrent responsibilities for research and service as integral members of the academic community.

Although a growing body of research has examined faculty competency development by incorporating faculty needs at both national and international levels, much of this work remains largely confined to educational or teaching-related demands [5-7]. In contrast, the present study adopts a holistic perspective on faculty competencies, conceptualizing them not only as teaching competencies but also as comprehensive capacities required of faculty as institutional members.

Moreover, despite clear differences in required competencies according to faculty rank, career stage, disciplinary background, and administrative roles, institutional mechanisms for systematically diagnosing these differences and providing differentiated support remain insufficient [8]. New faculty members struggle with acquiring pedagogical skills and adapting to the educational environment; faculty with administrative roles often lack preparation for administrative and leadership duties; and high-tenured faculty are required to balance teaching, research, and organizational management while demonstrating professional leadership, yet practical support remains limited. While the needs for each career stage and rank clearly exist, a systematic support structure to meet them is currently lacking. Therefore, establishing a customized competency strengthening system according to the faculty's career development stage and organically linking it with the university's support policies, performance management systems, and curriculum improvement can enhance the sustainability of faculty competency development and ultimately lead to qualitative improvement in education and better student learning outcomes [2].

The university is a hub of collective intelligence encompassing various majors and academic fields, and strengthening the professional expertise of faculty is the fundamental driving force behind academic advancement. The university where this study was conducted is a comprehensive institution located in the Seoul Metropolitan Area, composed of a large faculty body with diverse majors. It is typical in that it shares the educational innovation and quality management challenges faced by most domestic universities. Thus, this study uses A University as a case study to develop a practical and sustainable faculty

competency enhancement roadmap that reflects the characteristics of each faculty career cycle, aiming to provide a practical model and implications that similar domestic universities can adapt and apply to their own contexts. The purpose of this study is to propose a competency enhancement roadmap tailored to the needs of each career cycle for the strengthening of university faculty competitiveness and sustainable professional development.

Through this, the study aims to support the competency enhancement of individual faculty members at each career stage, establish a sustainable professional and career development system in preparation for the future society, and ultimately contribute to the qualitative improvement of education and student satisfaction.

2. Literature review

2.1. Faculty competencies by career cycle

Traditionally, university faculty competency has been narrowly defined, focusing primarily on pedagogy and lecturing skills related to 'teaching,' and faculty support programs have been operated accordingly [9-12]. However, the faculty role has recently expanded beyond that of a simple knowledge dispenser to include learning facilitator, researcher, organizational member, and social contributor, thereby broadening the concept of competency into a multi-dimensional one [13].

Kim(2021) researched the support required for faculty based on their position, major, and teaching experience. The study found that early career faculty had high demands for competencies such as empathy and reflection, and for support in understanding and communicating with learners. Mid-career faculty showed high demand for instructional design competency, while senior faculty required more support for assessment design and evaluation tools, suggesting that the necessary support components differ across the faculty career cycle [8]. This strongly indicates that the competencies required of faculty vary according to their career stage.

Kim et al. (2024) conducted a latent profile analysis of university faculty competencies, analyzing factors that predict the level of competency achievement based on faculty characteristic variables [14]. They derived implications that could aid support programs for faculty. While providing guidelines for developing a faculty competency model, the study was limited to competencies related only to teaching. Similarly, Jeong and Lee (2012) analyzed the importance and performance of faculty competencies based on faculty rank and experience but also predominantly focused on

lecturing skills [15]. Song et al. (2013) identified competencies required according to faculty experience and proposed necessary training programs, but their focus was also centered on teaching [16].

These studies suggest that faculty duties are not confined to lecturing and that their roles and competencies should evolve according to rank and administrative position. Nevertheless, existing research still exhibits a strong tendency to focus on pedagogy [15, 16]. Consequently, recent studies have begun focusing on competency development across the faculty career cycle [17]. The competencies required of university faculty are not limited to teaching. Song, Jang, and Kim (2013) broadly categorized university faculty competencies into Basic Competencies, Teaching Competencies, and Management Competencies. They defined Basic Competencies as knowledge about learners, affection and respect for students, motivation ability, creative thinking, and communication skills. Teaching Competencies included content selection and structuring, effective teaching strategy selection, learning material development, content delivery skills, class engagement and management skills, and learning assessment and feedback skills. Management Competencies were defined as continuous self-development ability, development of teaching professionalism, knowledge of school administration, and human networks [16]. This perspective implies that faculty duties are not restricted to lecturing and teaching activities but require diverse roles related to teaching, research, and service depending on their rank and administrative role.

Lee (2025) researched the characteristics of latent groups based on faculty competency levels and concluded that high proficiency in effective teaching does not necessarily translate to excellence in areas like research, student guidance, or university understanding. The study found that teaching competency was lower for new faculty or those with less teaching experience, while competency in teaching and understanding the university increased with experience and rank, leading to the conclusion that differentiated support based on rank and experience is necessary [18].

Buer et al.(2024) presented a career management life cycle model in the medical field, providing a framework for the required support at different career stages, including transitions from assistant to full professor, non-tenure track to full-time positions, and administrative roles [17]. Lee (2024) also pointed out that educational opportunities for faculty competency development are severely limited, except for new faculty workshops, emphasizing the need to provide systematic competency strengthening programs on both a short-term and long-term basis [1].

In conclusion, faculty competency development must shift from merely enhancing teaching skills for 'effective

lecturing' to a customized, staged support system that reflects differences in career and rank. Differentiated support should be provided: basic teaching competency and university adaptation for new faculty; professional expertise advancement and networking for growth-stage faculty; and leadership and mentoring-focused competencies for senior faculty. Such a differentiated strategy based on rank and career cycle will enhance faculty self-efficacy and organizational commitment, and further serve as a key mechanism for improving university educational quality and sustainable faculty competency enhancement.

2.2. Prior research on university faculty competency enhancement

Extensive research has been conducted to define what constitutes university faculty competency. Kang (2021) categorized the competencies required by universities into Basic Competencies, Instructional Competencies, and Support Competencies, and analyzed their relative importance and needs. The analysis showed the highest demand for Professional Knowledge and Student Understanding within Basic Competencies, followed by Instructional Execution within Instructional Competencies, and then Challenge and Sharing Support within Support Competencies [19].

Jeong and Byeon (2022), using IPA to analyze the perceptions and educational needs of 40 faculty members at four-year universities during the proliferation of online education, reported that the Concentrate Here quadrant (high importance, low performance) included competencies related to instructional design and teaching-learning facilitation. Specifically, the highest priority educational needs for new faculty were found to be guidance on personnel systems and internal regulations, and the usage of digital systems such as Learning Management Systems (LMS), suggesting a high demand for strengthening essential digital literacy competencies in the post-pandemic era [20].

Lee (2021) analyzed faculty competency needs by teaching experience, concluding that the top priority area for improvement across all faculty was development of instructional materials. Furthermore, sub-elements of instructional design competency were consistently identified as the highest priority needs across all career stages. Regarding stage-specific needs, the study suggested that new faculty prioritize student interest inducement, mid-career faculty prioritize reflection on teaching methods, and senior faculty prioritize systematic lesson planning and learning facilitation [4]. This emphasizes the necessity of a customized instructional consulting model that reflects the characteristics of each career stage.

Hwang and Kim (2024) diagnosed faculty competency

needs by rank and experience and suggested customized support plans. Among core competencies, Basic Competencies were the top priority support area, with Educational Philosophy and Motivation being common top priorities across all groups. Faculty with less than 7 years of experience showed a high demand for Basic Competencies such as student respect and passionate attitude. This outcome, attributed to the characteristic of university faculty being primarily appointed based on research capabilities, suggests that new faculty, in particular, face challenges in establishing a clear educational philosophy as educators, underscoring the need for learning coaching and systematic support for early career faculty [7].

These findings are consistently reported in international research as well. Barnes et al. (2022), in a study of faculty at a South African university, empirically demonstrated that the importance of career competencies—such as self-reflection, goal setting, collaboration, and continuous learning—varied across career stages, emphasizing the need for designing customized faculty development programs according to the career cycle [21].

In summary, prior research consistently confirms that the required competencies and their importance vary according to a faculty member's experience and rank. Therefore, effective faculty competency enhancement can be realized not merely through one-time training programs but through a sequence of processes: self-assessment to check current levels, linkage to customized programs, and the application of a competency enhancement roadmap by career stage. This can contribute not only to the self-directed growth of individual faculty members but also to the university-wide quality management of education and the securing of competitiveness.

3. Materials and Methods

3.1. Research design

This study was conducted in three main stages to develop a faculty competency enhancement roadmap tailored to the faculty career cycle: (Stage 1) Literature Review → (Stage 2) IPA Analysis and Development of the Career Cycle Roadmap based on the analysis results → (Stage 3) Focus Group Interview (FGI) for Refining the Career Stage-Based Roadmap. The specific procedures for each stage are as follows.

3.1.1. Stage 1: Deriving faculty competencies and developing survey items through literature review

First, a systematic review of domestic and international

prior research on faculty competency published since 2010 was conducted to develop survey items for deriving career-cycle-specific faculty competencies. Literature searches utilized the RISS, KISS, Google Scholar, and ERIC databases. Search terms were combined using 'faculty competency,' 'faculty competency,' 'career stage,' and 'professional development.'

The criteria for literature selection were as follows: the research subjects must be university faculty; the study must be empirical, dealing with competency diagnosis or development; the research methodology must have employed systematic methods such as IPA, Delphi, or Latent Profile Analysis; and the competency components must be explicitly presented. Based on these criteria, 25 final papers were selected (15 domestic, 10 international). By analyzing these papers, faculty competencies were categorized into key areas such as Teaching, Research, Social Service, and Leadership. Subsequently, 26 measurement items were developed in alignment with A University's Ideal Faculty Profile. The developed items were reviewed by five faculty development experts affiliated with the Center for Teaching and Learning (2 experts in Instructional Technology, 1 in HR·Organization, and 2 faculty development practitioners) to confirm the clarity, measurability, and suitability of the items within the context of A University. The literature analysis procedure is illustrated in Fig. 1.

3.1.2. Stage 2: Deriving priority for competency development by career cycle through IPA analysis

In Stage 2, a survey was administered to 130 faculty members to measure the Importance and Performance of the 26 finalized competency items, followed by IPA (Importance-Performance Analysis). The survey was con-

ducted over a two-week period, with voluntary participation through an online link. The selection of IPA as the analysis method for this study was based on the following reasons: IPA is a methodology that effectively identifies areas urgently needing improvement by visually comparing the perceived importance of a specific attribute with the actual level of performance [22].

Importance-Performance Analysis(IPA) was employed in this study to diagnose faculty competency development needs across career stages and to establish a priority-based competency enhancement roadmap. By simultaneously assessing perceived importance and actual performance, IPA enables the identification of competencies that are regarded as important but insufficiently performed [23].

The survey utilized a 5-point Likert scale (1=Strongly disagree, 5=Strongly agree), simultaneously measuring both Importance and Performance for each competency. The collected data was analyzed using SPSS 28.0. The IPA quadrants were constructed based on the overall mean values of Importance and Performance.

$$Q_i = (I_i - I^-, P_i - P^-)$$

- I_i : Importance score of the i^{th} competency
- P_i : Performance score of the i^{th} competency
- I^- : Mean Importance score of all competencies,
- P^- : Mean Performance score of all competencies

The reasons for using the mean values as the IPA quadrant criteria are as follows: First, the mean-based criterion is the standard methodology proposed by Martilla and James (1977) and is widely used in domestic higher education research, ensuring the consistency and comparability of result interpretation (Lim et al., 2017). Second, a pilot analysis was conducted using the upper and lower 25%

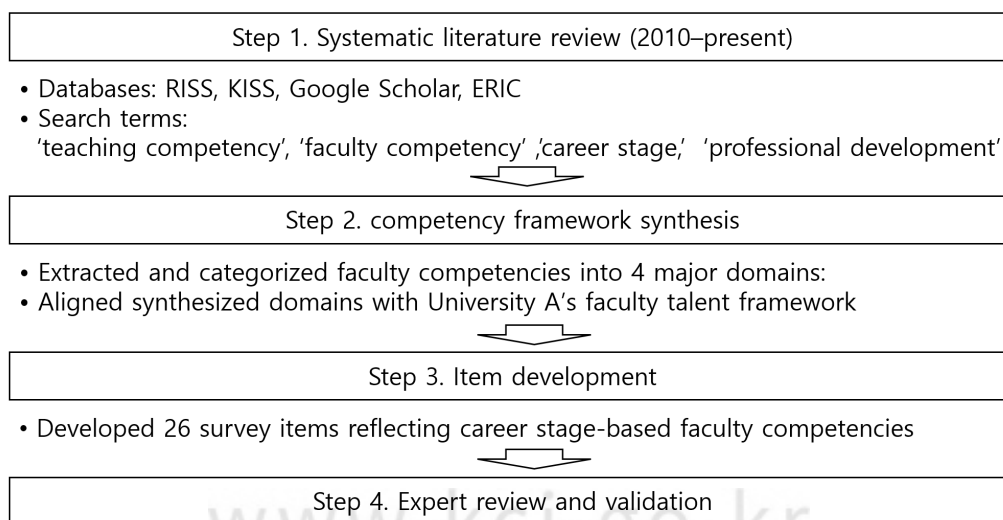


Fig. 1. Literature review process

criteria to verify the validity of the mean-based criterion. The results showed that the difference in quadrant distribution between the two criteria was within 8%, confirming that the mean-based criterion was appropriate for the present study's data. Third, the mean-based criterion is useful for deriving priorities by relatively comparing all competencies and has the advantage of maintaining consistency in interpretation when conducting comparative analyses across different groups based on career cycle.

The reliability of the measurement instrument was found to be very good, with a Cronbach' $\alpha=0.95$, for Importance and Cronbach's $\alpha=0.95$, for Performance. Additionally, sub-group analyses were conducted by rank (Full Professor, Associate Professor, Assistant Professor) and years of service (0-3 years, 4-9 years, 10-19 years, and 20+ years) to explore differences in competency development needs according to the career cycle.

In addition, when deriving the competency support programs based on the IPA results, this study did not limit its focus solely to competencies identified as urgently needing improvement. Competencies in which faculty members demonstrated relatively high levels of performance were also taken into consideration. This approach reflects an effort to move beyond a short-term deficit-oriented perspective on faculty competency development by maintaining and expanding areas that are already being effectively supported, while strategically strengthening competencies with relatively lower levels of performance. Through this approach, the study aimed to derive a competency support roadmap that is cumulatively and coherently structured according to faculty career cycles.

3.1.3. Stage 3: Focus group interview(FGI) for refining the career stage-based roadmap

To derive and refine a career stage-based faculty competency enhancement roadmap and related educational programs that are practically applicable, a focus group interview(FGI) was conducted. The focus group consisted of four participants, including decision-makers with authority to design and implement faculty development policies and faculty members with extensive professional experience. The interview protocol included questions addressing challenges encountered across different stages of the faculty career life cycle and the effectiveness of policies and programs designed to support faculty development. The findings from the FGI were used to refine and finalize the career stage-based faculty competency enhancement roadmap. The demographic profiles of the FGI experts are shown in Table 1.

Table 1. Demographic characteristics of FGI Participants

No.	Gender	Teaching experience	Position	Discipline
1	Male	10-19 years	Vice president for academic affairs (current)	Economics
2	Male	20+ years	Director of academic administration	Education
3	Female	10-19 years	Director of teaching and learning development center	Education
4	Male	20+ years	Vice president for academic affairs (former)	Engineering

3.2. Participants

The survey was conducted online, targeting full-time faculty at A University, including those on the tenure track (Professor, Associate Professor, and Assistant Professor) and non-tenure track (Teaching and Research-focused faculty). A total of 130 faculty members voluntarily participated and responded. This sample size represents approximately 26% of the total full-time faculty (approximately 491 members) at A University. Sampling was conducted considering the proportion of each college and rank to ensure the representativeness of the sample. The demographic characteristics of the respondents are presented in Table 2.

Table 2. Participant demographics

Category	Sub-category	N	Percentage (%)
Affiliation	College of humanities	14	10.8
	College of social sciences	22	16.9
	College of natural Sciences	21	16.2
	College of engineering	20	15.4
	Colleges of medicine, dentistry & pharmacy	17	13.1
	College of arts and physical education	14	10.8
	Graduate school	8	6.2
	College of liberal arts	13	10.0
	Software-centered college	1	0.8
Rank	Full professor	47	36.2
	Associate professor	33	25.4
	Assistant professor	25	19.2
	Non-tenure track faculty (Teaching and Research-focused Faculty)	24	18.5
	Foreign faculty	1	0.8
Sex	Male	82	63.1
	Female	48	36.9
Years of service	0-3 years	30	23.1
	4-9 yrs	37	28.5
	10-1 years	50	38.5
	20 Years or more	13	10.0
Total		130	100

4. Results

4.1. Derivation of core competency system based on a university's faculty talent model

This study derived the core faculty competency system by synthesizing prior research analysis with A University's educational vision and ideal talent profile. A University has set its educational goal as 'Fostering global talent equipped with creative thinking and practical skills,' and to achieve this, it has presented the ideal student profile as the 'Active Learner, Innovative Problem Solver, and Dedicated Community Member.' In this study, the competencies that faculty must possess to realize this student profile were restructured into an Ideal Faculty Profile.

Specifically, the Ideal Faculty Profile is subdivided into six core competencies: Instructional Design and Execution, Communication, Professionalism, Networking, Leadership, and Global Mindset. Each core competency is further specified into 2 to 3 detailed competencies. For example, the 'Active Facilitator' profile is linked to the 'Instructional Design and Execution' core competency, which is then composed of detailed competencies such as 'Educational Philosophy and Passion as an Educator' and 'Instructional Design and Class Operation.' This hierarchical structure served as a framework for systematically presenting the competencies that must be intensively developed at each

stage during the subsequent career-cycle roadmap design.

4.2. Results of IPA analysis on faculty competencies

4.2.1. Perception of importance and performance by competency (All Faculty)

The importance and performance scores were measured for the 26 finalized competency items among 130 faculty members. The results showed that the overall mean score for Importance was 3.97 (SD=.78), and the mean score for Performance was 3.83 (SD=.77). This indicates that faculty members generally perceive the presented competencies as important and evaluate their current level of performance as above average.

However, the gap between importance and performance varied among competencies, allowing for the identification of competency areas that require development priority. The IPA Matrix was divided into four quadrants based on the overall mean values for importance (M=3.97) and performance (M=3.83), as shown in Table 3.

As shown in Fig. 2, the overall educational needs analysis results for faculty members are presented. The IPA cut-off values were adjusted based on the consensus of three expert reviewers, allowing for more meaningful distinctions from a faculty competency development perspective compared to the traditional mean-based criteria.

Table 3. Importance and performance ratings (All faculty)

Item	Importance		Performance	
	M	SD	M	SD
Understanding of university educational system	145	3.92	0.82	3.88
Establishment of educational philosophy	145	4.28	0.69	4.28
Understanding of teaching methods	145	4.11	0.70	3.79
Curriculum development	145	4.28	0.68	3.94
Effective class management	145	4.20	0.68	3.92
Understanding and utilization of evaluation techniques	145	4.13	0.71	4.01
Understanding student diversity	145	4.12	0.71	3.89
Student empathy and support	145	3.92	0.75	3.64
Learning guidance	145	3.93	0.75	3.81
Career guidance	145	3.91	0.77	3.81
Development of major-specific professionalism	145	4.32	0.71	4.21
Understanding and application of trends	145	4.23	0.67	4.17
Understanding of other academic fields and convergent thinking	145	4.02	0.74	3.92
Execution of convergence research and education	145	4.01	0.78	3.85
Information sharing with internal university members	145	3.95	0.75	3.77
Establishing external networks	145	3.86	0.77	3.48
Leading university innovation	145	3.85	0.80	3.52
Participating in university innovation	145	3.94	0.81	3.59
Understanding of vision, educational goals, and ideal talent profile	145	3.88	0.79	3.83
Practice of education and research aligned with vision, goals, and profile	145	3.88	0.78	3.71
Collaboration with university and department members	145	3.79	0.84	3.74
Empathy for university and department members	145	3.92	0.73	3.82
Global communication	145	3.66	0.84	3.72
Acceptance of global cultures	145	3.99	0.81	3.96
Interest and participation in university issues	145	3.55	0.85	3.61
Empathy and participation in the local community	145	3.66	0.78	3.59

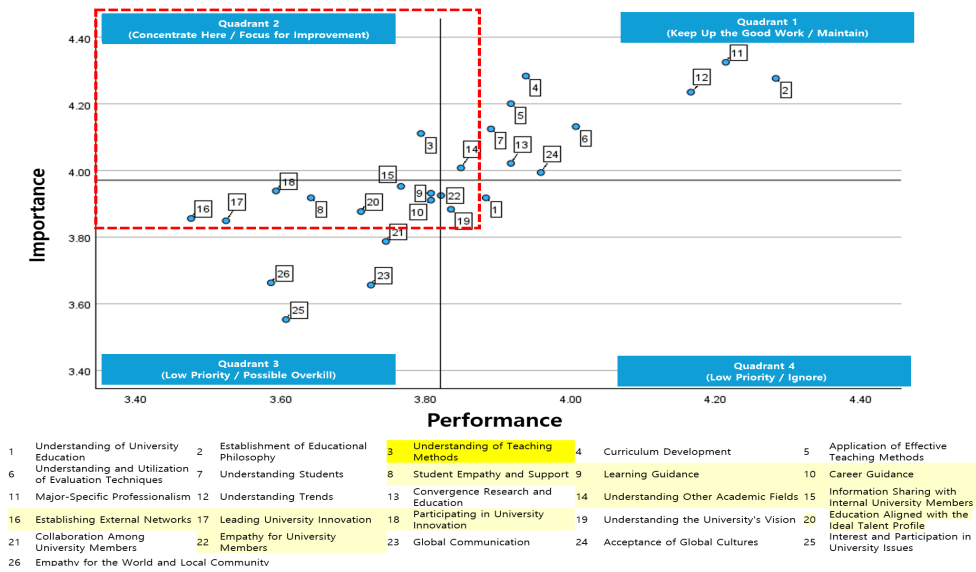


Fig. 2. IPA matrix for faculty competencies (All faculty)

The competencies in Quadrant 1 (Maintain/Strengthen Area) are those that faculty members perceive as highly important and are performing well on. It is necessary to maintain the current level and disseminate best practices in this area. This quadrant included 9 competencies, such as 'Establishment of Educational Philosophy' (Importance 4.29, Performance 4.18), 'Curriculum Development' (Importance 4.16, Performance 3.94), 'Understanding and Utilization of Evaluation Techniques' (Importance 4.14, Performance 3.96), 'Effective Application of Teaching Methods' (Importance 4.30, Performance 3.96), 'Major Professionalism' (Importance 4.33, Performance 4.22), 'Understanding of Trends' (Importance 4.26, Performance 4.18), and 'Acceptance of Global Cultures' (Importance 4.21, Performance 3.94). This result suggests that A University faculty members possess a high level of competency regarding their basic qualities as educators and their professional expertise. Notably, the highest scores recorded for 'Major Professionalism' and 'Establishment of Educational Philosophy' can be interpreted as reflecting the university's characteristic as a research-focused institution and the positive outcomes of recent pedagogical programs offered by the Center for Teaching and Learning (CTL).

Quadrant 2 (Concentrate Here/Intensive Improvement Area) consists of competencies that faculty members perceive as highly important but where their actual performance level is low, demanding priority and intensive improvement. The analysis found that 12 competencies were located in this quadrant, including 'Understanding of Teaching Methods(Pedagogy)' (Importance 4.35, Performance 3.75). The fact that 'Understanding of Teaching Methods' showed the largest gap is a noteworthy, yet paradoxical, result: faculty members rate the 'Effective Application of Teaching Methods' (Q1) highly but perceive their 'Understanding of Teaching Methods' as insufficient. This suggests that

while faculty run their classes based on experience and intuition, they lack a systematic understanding of the theoretical foundations and principles of diverse pedagogical methods. Competencies such as 'Student Empathy and Support,' 'Establishing External Networks,' and 'Information Sharing with Internal University Members' also showed lower performance compared to their perceived importance, indicating the need for focused development in these areas. Especially in the case of new faculty, who are often appointed without systematic training in pedagogy and evaluation during their doctoral programs, they tend to develop their methods through trial and error. Therefore, systematic education on pedagogy, evaluation techniques, and interdisciplinary understanding for convergent thinking should be prioritized, with concentrated support needed particularly during the early career stage.

The competencies in Quadrant 3 (Long-Term Improvement Area) have low scores for both importance and performance, giving them a low short-term priority. However, these areas require re-evaluation based on the university's strategic direction and changes in the higher education environment. This quadrant included 4 competencies, such as 'Collaboration with University Members' (Importance 3.92, Performance 3.80), 'Global Communication' (Importance 3.70, Performance 3.69), 'Interest and Participation in University Issues' (Importance 3.55, Performance 3.61), and 'Empathy with the World and Local Community' (Importance 3.62, Performance 3.57). This result shows that faculty members perceive external networking, interest and participation in university issues, and global competencies as relatively less important, with similarly low actual performance. This is interpreted as reflecting the traditional view that still sees the faculty's core role as confined to 'lecturing and research.' However, recent higher education trends

emphasize student success, industry-academia cooperation, and the social responsibility of the university, suggesting that the importance of these competencies will likely increase in the future. Therefore, a long-term perspective is needed for raising awareness and implementing a staged development strategy for these competencies.

Quadrant 4 (Manage Efficiently Area) consists of competencies where the actual performance is relatively higher than the perceived importance, suggesting that the current level should be maintained while avoiding excessive resource investment. Only 1 competency, 'Understanding of University Education' (Importance 3.92, Performance 3.88), was located in this quadrant. This means that A University faculty's actual performance level in understanding university education is higher than their perceived importance. This result can be interpreted in two ways: First, it may be the result of the university's various efforts to share its vision (such as new faculty orientation, regular faculty meetings), leading to a sufficiently high level of faculty understanding of the university's education. Second, it may reflect the tendency of faculty to prioritize practical tasks, such as their own teaching and research, over the university's macro vision. Therefore, there is a need to shift away from repetitive education on vision understanding itself toward a more concrete approach that shows how the university's education links with individual faculty members' teaching and research activities.

4.3. IPA analysis results by career cycle

In addition to the IPA analysis conducted on all faculty members, sub-group analyses were performed by career stage (0-3 years, 4-9 years, and 10+ years) to identify differ-

ences in competency development needs according to the faculty's career cycle. The analysis revealed that the competency priorities varied by rank, suggesting that the direction of competency enhancement and professional development needs to be set differently for each faculty career stage.

In the case of Assistant Professors (typically 0-3 years of service), they perceived their performance in 'Understanding of Teaching Methods(Pedagogy)' (a common issue across all ranks) and 'Curriculum Development' as significantly lower relative to their importance. Assistant Professors showed a greater need for Instructional Competencies. Conversely, competencies such as 'Understanding of University Education,' 'Leading University Innovation,' and 'Education Aligned with the Ideal Talent Profile' were rated low in both performance and importance (Quadrant 3), indicating that an understanding of the university's vision and goals is essential during this early career stage. Furthermore, competencies such as 'Establishing Faculty Networks' and 'Empathy for University Members' were also included in the Concentrate Here (Q2) area, suggesting that fostering a sense of belonging and building networks are important competencies for early-career faculty. The IPA matrix for Assistant Professor competencies is presented in Fig. 3

In the case of Associate Professors (typically 4-9 years of service), the demand for 'Understanding of Teaching Methods (Pedagogy)' remained high overall. They also showed a high perceived need for other instructional competencies such as 'Effective Application of Teaching Methods' and 'Understanding and Utilization of Evaluation Techniques.'

Furthermore, compared to the Assistant Professor stage, Associate Professors perceived competencies like

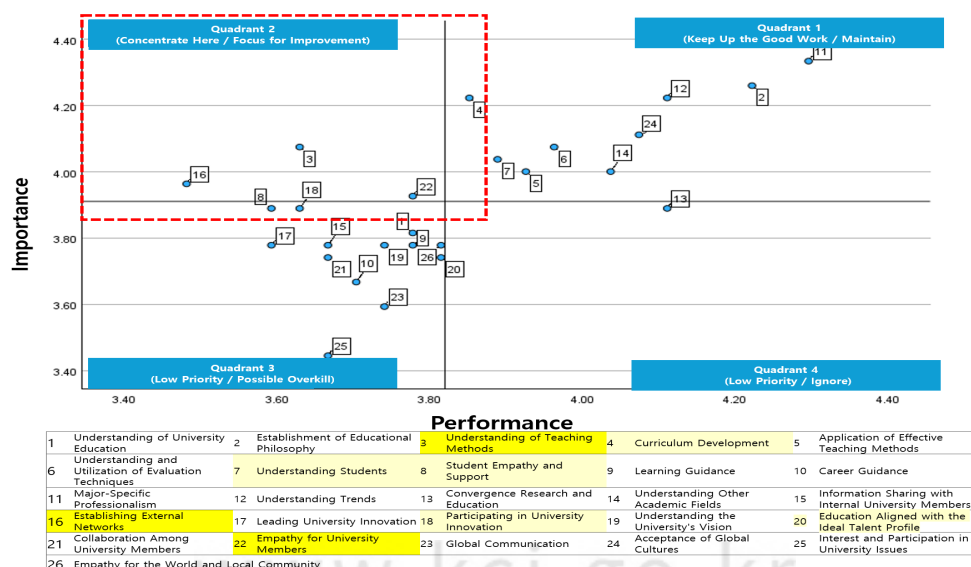


Fig. 3. IPA Matrix for faculty competencies (assistant professors)

'Understanding of Other Academic Fields,' 'Understanding of University Vision,' and 'Education Aligned with the Ideal Talent Profile' as more important. This is interpreted as reflecting the career development characteristic of the Associate Professor stage, where the simultaneous demand for teaching, research, and administrative roles leads to increased burden related to student guidance and organizational communication.

Specifically, the necessity for competencies related to departmental operation, such as student evaluation and learning guidance, was highlighted. This indicates a requirement for advanced pedagogical enhancement, student and career guidance programs, and administrative competency development programs targeted at mid-career faculty.

The IPA matrix for Associate Professor competencies is presented in Fig. 4.

Full Professors (typically 10+ years of service) showed

the lowest perception of both Importance and Performance across all faculty ranks. This indicates a general saturation or possible disconnect regarding the measurement items at this senior stage. Relative to other ranks, Full Professors showed the highest importance perception for 'Participating in University Innovation.' They also identified competencies related to student guidance and interaction with colleagues as both important and deficient (Concentrate Here, Q2). These competencies include 'Understanding of Students,' 'Learning Guidance,' 'Information Sharing with Internal University Members,' and 'Collaboration with University Members.' This suggests that for senior faculty, the priorities shift away from basic pedagogy toward organizational leadership, mentorship, and actively shaping the future of the institution, alongside continued commitment to student success and collaborative governance. The IPA matrix for Full Professor competencies is presented in Fig. 5.

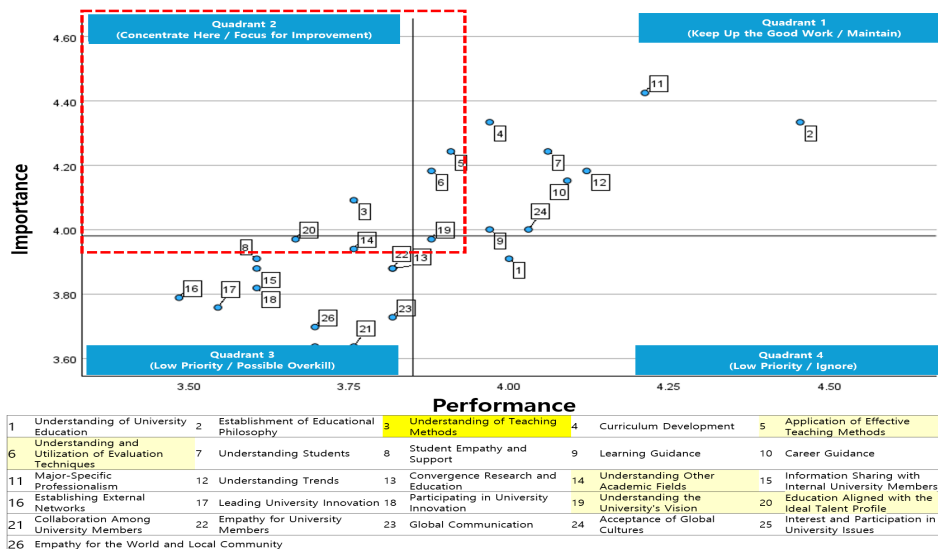


Fig. 4. IPA matrix for faculty competencies (associate professors)

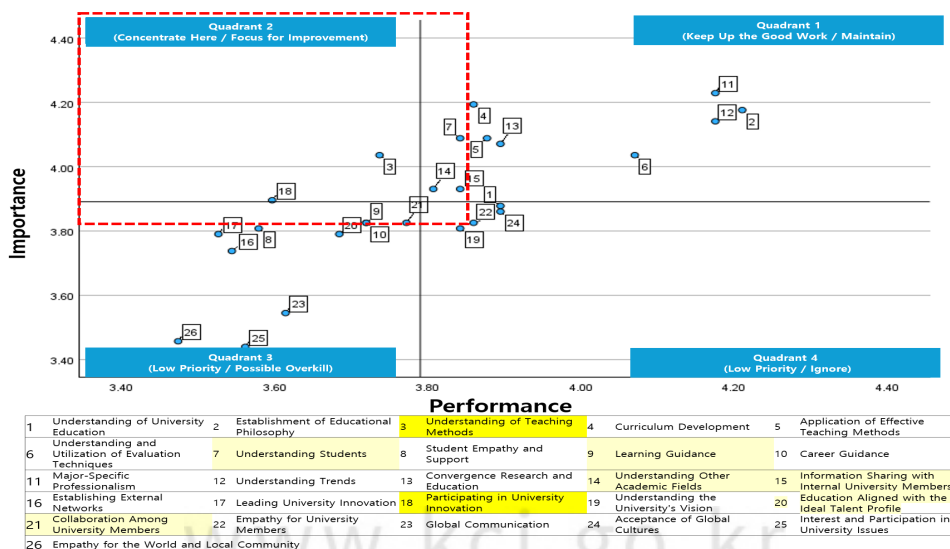


Fig. 5. IPA matrix for faculty competencies (full professors)

4.4. Implications for faculty competency development

The synthesis of the IPA analysis results allows for the establishment of the following priorities for A University's faculty competency enhancement policy. The highest priority is the reinforcement of 'Understanding of Teaching Methods (Pedagogy)' competency, necessitating the development and provision of systematic educational programs focused on the theoretical foundations and practical principles of diverse teaching methods. These findings are consistent with prior studies that have examined faculty development needs and the enhancement of teaching competencies among university faculty [24]. Specifically, basic pedagogy workshops should be mandated for new faculty, and the provision of advanced programs, such as learner-centered pedagogy and online instruction methods, should be considered for mid-career faculty.

The second priority calls for raising awareness and staged development of Student Guidance, Organizational Participation, and Networking competencies. This should be achieved through awareness improvement programs that emphasize the influence of these competencies on faculty's comprehensive professionalism and institutional competitiveness. Practical case sharing and support, particularly in student coaching and industry-academia networking, are required for mid-career faculty and above.

The third priority involves the discovery and dissemination of best practices in competencies that are already being maintained at a high level. Examples of faculty demonstrating excellent performance in areas like Educational Philosophy, Major Professionalism, and Effective Application of Teaching Methods should be identified and disseminated through mechanisms such as Faculty Learning Communities and Teaching Portfolio Competitions.

Significantly, a meaningful difference was observed in the competencies requiring intensive improvement across the faculty career cycle. This stage-specific variation served

as a crucial rationale for designing the faculty competency enhancement roadmap. It suggests that a differentiated support strategy is necessary, focusing on Instructional Design and Execution competencies during the early career stage, Student Guidance, Empathy, and Communication competencies during the growth stage, and Networking and Leadership competencies during the maturity stage. The competencies requiring intensive improvement by career stage are summarized in Table 4.

4.5. Detailing the faculty competency enhancement roadmap

4.5.1 Fundamental principles for designing the faculty career cycle roadmap

The faculty competency enhancement roadmap by career cycle was designed by integrating the previously derived Ideal Faculty Profile system with the IPA analysis results. Specifically, the fundamental principles guiding the roadmap's design were as follows.

First, the roadmap sought to facilitate the staged realization of the Ideal Faculty Profile. The three Ideal Faculty Profiles (Active Facilitator, Innovative Expert, and Dedicated Leader) were structured as competency areas sequentially emphasized according to the career cycle. For the early career stage, the focus was on developing Instructional Design and Execution and Communication competencies, aligning with the 'Active Facilitator' profile. The growth stage emphasized Professionalism and Convergence competencies, aligning with the 'Innovative Expert' profile. Finally, the maturity stage concentrated on developing Leadership and Global Mindset, aligning with the 'Dedicated Leader' profile.

Second, the roadmap established priorities based on the IPA results. In each career stage, competencies located

Table 4. Focus areas for Improvement by career cycle

Career stage	Years of service	Areas for focused improvement (high Importance · low Performance)	Key characteristics
Early career stage	0-3 Years	Understanding of teaching methods, curriculum development, understanding and utilization of evaluation techniques	Gaps observed across basic competencies in instructional design and execution. Lack of theoretical foundation.
Growth stage	4-9 Years	Student empathy and support, learning guidance, career guidance	Lecture operation is stable, but individual student guidance competency is lacking. Need for enhanced communication skills.
Maturity stage	10+ years	Establishing external networks, leading university innovation, collaboration among university members, empathy for university members	Educational and research competencies are mature, but need for development in external collaboration and organizational leadership skills. High personal expertise, but need for strengthened competency in nurturing junior colleagues (mentoring) and organizational contribution.

in the 'High Importance, Low Performance' (Quadrant 2) area were set as the highest priority development targets, while competencies in the 'Low Importance, Low Performance' (Quadrant 3) area were designated as the secondary priority.

Third, the design incorporated the concept of cumulative competency development. Competencies developed in the previous stage were designed to be continuously maintained and deepened in the subsequent stage, thereby promoting the cumulative growth of faculty capabilities throughout their careers.

4.5.2 Core competencies and development strategies by faculty career cycle

The faculty career cycle was categorized into the Early Career Stage (0-3 years, Assistant Professor), Growth Stage (4-9 years, Associate Professor), and Maturity Stage (10+ years, Full Professor), considering Anderson and Anderson's (2011) lifecycle model and domestic university personnel systems.

Faculty in the early career stage (0-3 years, Assistant Professor), having primarily received training as researchers during their doctoral studies, often lack systematic preparation as educators. Consequently, the establishment of foundational competencies for 'teaching' is the highest priority during this period. The IPA analysis revealed that the largest Importance-Performance gap for this group was in 'Understanding of Teaching Methods' and 'Curriculum Development,' reflecting the reality of operating classes through trial and error without a strong theoretical foundation. Thus, the essential core programs for the early career stage include: New Faculty Orientation to establish an understanding of the university system and educational philosophy; Basic Pedagogy Workshops focusing on the principles and application of major teaching methods (e.g., lecture, discussion, problem-based learning); Instructional Design Practice (ensuring the alignment of learning goals, instructional activities, and assessment); and a Mentoring System involving one-on-one matching with experienced faculty for class observation and feedback.

Faculty in the growth stage (4-9 years, Associate Professor) have generally secured basic lecturing skills, but this period necessitates deeper individualized student guidance and the intensification of research expertise. The IPA analysis showed gaps for this group in competencies requiring deep interaction with students, such as 'Student Empathy and Support,' 'Learning Guidance,' and 'Career Guidance.' Furthermore, Focus Group Interview (FGI) results indicated that the increasing pressure for research outcomes leading up to the Associate Professor promotion often causes them

to struggle with maintaining a balance between teaching and research. Consequently, the following are necessary core programs for the growth stage: Student Coaching and Counseling Techniques Workshops; Advanced Pedagogy Courses (e.g., flipped learning, online instruction methods, project-based learning); Support for Interdisciplinary Research Groups (facilitating cooperative research and the development of convergent courses with faculty from other majors); and Mandating participation in Faculty Learning Communities to share educational experiences with peers.

The maturity stage (10+ years, Full Professor) is reached when faculty's teaching and research competencies are both at a high level, making the key objective the expansion of individual expertise to the organization and society. The IPA analysis indicated development needs for this group in organizational leadership and external collaboration competencies, such as 'Establishing External Networks,' 'Leading University Innovation,' and 'Empathy for University Members.' Given that faculty at this stage frequently assume administrative roles (e.g., Deans, Department Heads), administrative leadership and succession planning·mentorship competencies become particularly crucial. Therefore, the core programs provided for the maturity stage are designed to include: Leadership Competency Enhancement Workshops (covering empathetic leadership, change management, and conflict resolution); Support for Industry-Academia Cooperation and Community Engagement Programs; International Collaborative Research and Exchange Programs; Role as a Faculty Community Leader (mentoring new faculty and sharing best teaching practices); and Support for the Design and Execution of Convergence Education.

4.5.3 Alignment Structure of the Talent Model and Development Programs

The alignment structure connecting the Faculty Talent Model, Core Competencies, Detailed Competencies, and the corresponding development programs is visually represented in Fig. 6. This roadmap graphically illustrates which Talent Model the faculty member should aim for at each career stage, which competencies they need to develop, and which programs they should participate in to achieve these goals.

Crucially, the Faculty Talent Model was not presented as an abstract concept; instead, it was intentionally linked to specific competencies and programs. For instance, the 'Active Facilitator' Talent Model was operationalized through the 'Instructional Design and Execution' and 'Communication' core competencies, and then linked to proposed programs such as 'Pedagogy Workshops,' 'Instructional Design Practice,' and 'Student Coaching Workshops.' This hierarchical

Academic rank	Career stage	Primary role	Core competencies	Example programs
Professor	Maturity stage	Global innovation leader	<ul style="list-style-type: none"> Advancing higher education philosophy Enhancing institutional competencies Strengthening university governance and leadership Developing future-oriented competencies 	<ul style="list-style-type: none"> Future-oriented competency consulting for leaders Advanced teaching workshop Community-engaged faculty learning community Faculty-student mentoring program
Associate professor	Growth stage	Empathetic educator and research expert	<ul style="list-style-type: none"> Advancing pedagogical expertise Improving student learning outcomes Developing student guidance and advising competencies Strengthening institutional engagement 	<ul style="list-style-type: none"> Professional teaching competency consulting Student guidance and empathy workshop Advanced teaching methods workshop Convergent/interdisciplinary teaching workshop
Assistant professor	Entry stage	University vision-aligned educator	<ul style="list-style-type: none"> Understanding educational philosophy and values Developing basic teaching competencies Enhancing curriculum design skills Strengthening student support and communication 	<ul style="list-style-type: none"> Individualized faculty development consulting Basic teaching and learning workshop Curriculum design and teaching practice workshop Faculty learning community for early-career faculty

Fig. 6. Roadmap for faculty competency development by rank and career stage

alignment structure provides faculty members with a concrete pathway for diagnosing their current position and advancing to the next stage of their career development.

5. Conclusions, limitations, and Future research

This study aimed to propose a faculty competency enhancement roadmap that reflects career cycle requirements to strengthen the competitiveness and ensure the continuous professional development of faculty members at A University, a four-year comprehensive university located in the Seoul metropolitan area. To achieve this, the study derived core faculty competencies through literature review and an examination of the university's Ideal Talent Model, diagnosed the level of demand for faculty competency development using Importance-Performance Analysis (IPA), and verified the analysis results and explored practical applicability through Focus Group Interviews (FGI). The analysis commonly revealed that 'Understanding of Teaching Methods' was an area requiring intensive improvement due to its low performance relative to its high importance, while 'Understanding of University Education' was categorized as an over-invested area due to its higher performance than perceived importance.

Differences were identified across the career cycle, indicating that Instructional Design and Basic Pedagogy should be the focus during the early career stage, Student Guidance, Assessment, Empathy, and Communication

during the growth stage, and Networking, Leadership, and Organizational Contribution during the maturity stage. This finding is consistent with prior research arguing that a career cycle-specific support system increases the effectiveness of faculty competency development [6, 8, 17]. These results suggest that university-level faculty competency enhancement policies must be designed as differentiated and customized roadmaps according to the career stage. Based on this, the study proposed a stage-specific competency enhancement roadmap reflecting the unique characteristics of the faculty career cycle.

One of the critical factors universities must address to enhance educational quality and secure competitiveness is the role and competency of faculty [25-27]. To secure faculty with excellent competencies, establishing a support system based on the substantiality of the teaching and learning process is essential [28-29]. However, while current faculty competency enhancement programs exist in various forms, such as special lectures, workshops, class recording analysis, consulting, and teaching portfolios, most suffer from the limitation of remaining as one-off or promotional operations rather than being based on a systematic, long-term development framework [30]. Furthermore, faculty hiring and evaluation are still heavily centered on research output, often resulting in the relative neglect of teaching competency development [7].

In response, this study proposed a customized competency enhancement roadmap reflecting the career cycle characteristics and rank-specific needs of faculty. Specifically, the roadmap suggested enhancing class design abilities

and research expertise for early-career faculty; strengthening student guidance, empathy, and communication skills for growth-stage faculty; and expanding networks and contributing to the faculty community for maturity-stage faculty as core tasks. This roadmap can function as a practical guideline to mitigate competency gaps across faculty career stages and enhance the alignment between the university's Ideal Talent Model and organizational vision.

Moreover, for faculty competency enhancement policies to have a practical effect, clear priorities for differentiated implementation strategies and resource allocation must be set according to the career stage. For early-career faculty, the priority must be strengthening basic competencies centered on pedagogy and instructional design. For growth-stage faculty, securing a balanced competency in research, teaching, and student guidance is crucial, necessitating the expansion of integrated teaching-research workshops and programs focused on departmental operation and leadership skills. For maturity-stage faculty, academic network expansion and organizational leadership are key tasks, so supporting faculty community operation, vitalizing faculty research groups, and supporting international co-teaching and exchange programs should be prioritized. These principles of resource allocation must secure effectiveness by prioritizing needs and competency gaps based on the faculty career cycle, implementing incentive systems focused on participation and contribution rather than outcomes, and making selective investments that consider alignment with the university's Talent Model.

This study possesses the following limitations: First, the results are based on a single university case, suggesting they may have been influenced by the specific organizational culture and institutional characteristics of that university. Future research needs to expand the generalizability of the findings through comparative studies reflecting the current status of universities, potentially categorized by type (e.g., public/private) or size.

Second, while IPA analysis is useful for identifying the perceived difference between importance and performance, it has limitations in fully explaining the qualitative aspects of actual competency application.

Third, empirical verification of the proposed roadmap's feasibility and policy effect was not conducted. Future research should confirm the generalizability of this study by including comparative analyses across universities of various regions, sizes, and founding types.

Furthermore, combining qualitative approaches, such as in-depth interviews and participant observation, is necessary to analyze the contextual factors of faculty competency development. Subsequent research should also verify the practical effect of competency development by

conducting longitudinal analysis considering temporal changes or qualitative case studies on participation experiences in faculty development, based on the IPA results of this study. Finally, a statistical verification of competency structure differences based on faculty rank, major, and administrative appointment status would enable a more refined roadmap design.

Although this study is limited by its reliance on a single-institution case, the following strategies are proposed to enhance the generalizability of the findings. First, the case institution is a comprehensive university located in the Seoul metropolitan area, which reflects structural characteristics shared by many higher education institutions in South Korea, thereby increasing the applicability of the results. The faculty competency framework and IPA-based analytical approach presented in this study were derived from a systematic review of domestic and international literature, enabling the findings to serve as conceptual guidelines for university faculty competencies beyond the specific institutional context.

Furthermore, the career stage-based faculty competency enhancement roadmap proposed in this study was not developed solely on the basis of survey results; its validity was reinforced through expert review and focus group interviews (FGI). These procedures were employed to strengthen the reliability of the interpretation and to enhance the practical applicability of the findings. Future research should further examine the external validity and effectiveness of the proposed roadmap through comparative studies across multiple institutions and longitudinal analyses over time.

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Conflicts Interest

No author has any other conflict of interest to declare.

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