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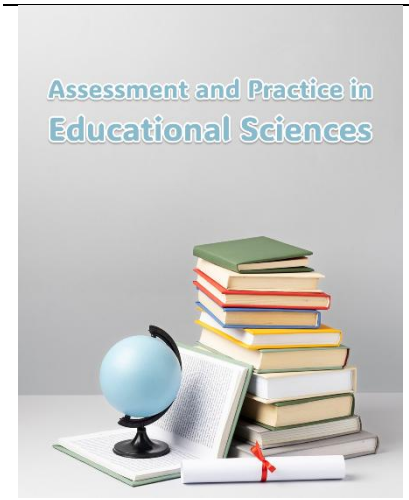

Validation of a Professional Development Model for Academic Department Heads in Universities Based on Individual Coaching Approaches

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ABSTRACT

This study aimed to design and validate a professional development model for academic department heads in Iranian universities based on individual coaching approaches. A mixed-methods exploratory design was employed, combining qualitative and quantitative methodologies. In the qualitative phase, semi-structured interviews were conducted with 14 academic experts selected through purposive sampling, and data were analyzed using grounded theory coding (open, axial, and selective coding). In the quantitative phase, a researcher-developed questionnaire based on the qualitative findings was distributed to a sample of 252 academic department heads using simple random sampling. Confirmatory factor analysis (CFA) was performed using PLS-SEM to assess the structural validity of the proposed model, alongside model fit indices including SRMR, RMS Theta, R^2, and f^2 values. Confirmatory factor analysis demonstrated strong and statistically significant factor loadings across all six components of the model—causal conditions, contextual conditions, intervening conditions, core phenomenon, strategies, and consequences. SRMR and RMS Theta values confirmed acceptable model fit across all components. R^2 values ranged from moderate to high (0.472 to 0.831), indicating substantial explanatory power, while f^2 effect sizes confirmed that most constructs had large or very large influence on their respective outcomes. Among all components, the consequences and core phenomenon dimensions showed the highest predictive validity, particularly in improving managerial competencies, fostering motivation, and enhancing organizational learning. The findings validate the proposed individual coaching-based model as an effective framework for the professional development of department heads in higher education. The model is theoretically grounded, empirically supported, and practically applicable, offering universities a structured path toward leadership capacity building. Its implementation could contribute significantly to institutional improvement, faculty engagement, and sustainable academic governance.

Keywords: Professional development, individual coaching, academic leadership, department heads, higher education, confirmatory factor analysis, mixed-methods research.

Introduction

In recent decades, the role of academic leadership, especially at the departmental level, has undergone a profound transformation in response to growing complexity in higher education systems worldwide. The demands on department heads extend beyond traditional administrative functions and increasingly include leadership in innovation, faculty development, curriculum planning, quality assurance, and academic performance enhancement. As universities attempt to navigate global

competition, technological disruption, and increased accountability, effective leadership at the department level has become pivotal to institutional success. In this context, professional development models grounded in *individual coaching* have garnered increasing scholarly attention due to their focus on fostering adaptive, reflective, and context-sensitive leadership capacities (1, 2).

Coaching as a professional development strategy emphasizes personal growth, autonomy, and self-regulated learning—qualities that are essential for academic leaders operating in uncertain and evolving organizational environments. Unlike traditional approaches centered on training or mentoring, coaching supports individuals in discovering their strengths, aligning their goals with institutional vision, and navigating interpersonal and systemic challenges (3, 4). This approach is particularly valuable for academic department heads who are often promoted for their research and teaching excellence but may lack formal leadership preparation (5).

Emerging literature supports the integration of coaching into faculty development as a means of building sustainable leadership pipelines and promoting institutional resilience. For instance, research has shown that coaching can significantly enhance self-awareness, decision-making, and strategic thinking among academic leaders (6). Coaching also facilitates adaptive learning by helping faculty reflect on their professional experiences and reframe challenges as opportunities for growth (7). Such reflective capacity is critical in a rapidly changing academic environment, where static competencies are insufficient to address dynamic and multilayered responsibilities (8, 9).

In the context of Iranian higher education, where structural rigidities, policy fluctuations, and centralized governance often inhibit leadership development, a coaching-based model offers a unique opportunity for transformative engagement. Abdollahi et al. (10) argue for a paradigm shift from reactive, procedural development models to strategic, individualized pathways that align faculty leadership roles with institutional priorities. Their grounded theory approach to faculty development in Farhangian University underlines the need for coherent conceptual frameworks rooted in both theory and contextual realities. Building on their work, the present study aims to validate a professional development model for department heads using a mixed-methods design that integrates qualitative insights with confirmatory quantitative analysis.

The effectiveness of coaching is also supported by robust empirical findings in diverse higher education systems. For instance, a systematic review by Bilal et al. (11) demonstrated that faculty development programs incorporating coaching significantly improved participants' pedagogical competence, leadership capabilities, and organizational commitment. Similarly, studies conducted in North America and Europe reveal that executive coaching leads to measurable improvements in emotional regulation, conflict resolution, and strategic communication—key competencies for academic department heads (1, 12).

International models of coaching in education further validate its applicability. For example, Takei et al. (13) introduced a best-practice framework for coaching in competency-based education, emphasizing iterative goal-setting, personalized feedback, and performance alignment. In Eastern Europe, Savchuk et al. (14) developed a two-tier coaching model for teacher training that highlights the scalability of coaching principles across institutional levels. These models illustrate the global momentum behind coaching as an effective professional development tool in education.

The benefits of coaching are not only practical but also psychological. Coaching interventions promote a sense of ownership, agency, and resilience among academic leaders (2, 15). As coaching fosters ongoing self-evaluation, it contributes to emotional intelligence and ethical responsibility—both of which are indispensable for managing teams, resolving conflicts, and ensuring inclusive governance (5, 7). Coaching also supports leaders in translating abstract institutional missions into tangible departmental strategies, thereby enhancing organizational coherence and effectiveness (16).

Nonetheless, effective implementation of coaching in academic settings requires supportive infrastructures and strategic alignment. Hejazi (17) emphasizes that without organizational commitment, clear evaluation mechanisms, and cultural readiness, even well-designed coaching interventions may not yield sustained results. This is particularly relevant in Iranian universities where hierarchical norms, centralized policy-making, and limited leadership autonomy may constrain innovation. In response, the present study proposes an evidence-based, culturally grounded coaching model designed specifically for Iranian academic contexts.

A key distinction in coaching literature lies between directive mentorship and non-directive coaching. Lim and Patel (3) argue that coaching is fundamentally collaborative, aiming not to instruct but to unlock individual potential. This aligns with constructivist theories of adult learning, where knowledge is co-created rather than transmitted. Coaching thus empowers academic leaders to think critically, act autonomously, and respond flexibly to evolving institutional demands. Such capacities are essential for department heads who must simultaneously manage personnel, mediate between faculty and administration, and drive programmatic innovation (18).

Furthermore, studies have highlighted the pedagogical applications of coaching, demonstrating that it enhances student-centered learning when adopted by faculty leaders (5, 19). For example, Pisklova and Bekoeva (19) found that pedagogical coaching fosters the personal development of both instructors and students by facilitating reflective practice and interpersonal sensitivity. This dual impact strengthens the argument for integrating coaching not only in leadership development but also in broader institutional pedagogical strategies.

Recent investigations have expanded coaching research to include institutional performance. In a study of Tanzanian universities, Buberwa et al. (20) found that coaching practices significantly influenced key indicators of university performance, such as faculty engagement, student satisfaction, and administrative effectiveness. This reinforces the view that coaching is not merely an individual intervention but a strategic organizational resource that can align human capital development with institutional outcomes.

Despite the growing body of international research, localized studies remain essential for understanding how coaching functions in specific sociocultural and organizational contexts. The professional development needs of Iranian department heads—shaped by distinctive governance structures, cultural norms, and policy constraints—necessitate a tailored model that is both evidence-based and contextually sensitive. Drawing from grounded theory and confirmatory factor analysis, this study seeks to construct and validate such a model.

By incorporating coaching as the core theoretical framework, this research contributes to a more nuanced understanding of academic leadership development in non-Western contexts. It also responds to the growing consensus that leadership in higher education must be proactive, inclusive, and learning-oriented.

Methods and Materials

This research employed an applied objective, as its findings are intended to be of practical use to universities and higher education institutions in Iran. In terms of its methodology, the study followed an exploratory design with a mixed-method approach, incorporating both qualitative and quantitative components. The research population consisted of all academic department heads in Iranian universities and higher education institutions in non-medical disciplines. Entry into the population was based on affiliation with the Ministry of Science, Research, and Technology, while departments under the Ministry of Health and Medical Education were excluded.

Given the impracticality of studying the entire population, two separate sampling procedures were carried out—one for the qualitative phase and another for the quantitative phase. In the qualitative phase, data were collected through semi-structured

interviews conducted with 14 experts. Participants were selected based on theoretical relevance and purposeful sampling criteria. Interviews continued until theoretical saturation was reached. The inclusion criteria for this phase required participants to be members of the academic staff in non-medical fields, hold a minimum academic rank of assistant professor, and have at least two years of experience as a department head. In the quantitative phase, data were collected using a randomized sampling method from a sample of 252 eligible individuals who met the same inclusion criteria as the qualitative phase. These participants completed a structured questionnaire either in person or virtually.

The study employed multiple data collection methods suited to the mixed-methods design. During the literature review phase, data were gathered using library and document analysis methods. This entailed the examination of up-to-date and credible academic sources such as books, dissertations, and peer-reviewed articles related to the topic of professional development and coaching in academic leadership.

In the qualitative phase, semi-structured interviews were used. These interviews were guided by an open-ended question protocol designed to explore participants' experiences and insights regarding individual coaching in academic settings. The aim was to identify key dimensions, contextual elements, and mechanisms related to professional development in educational leadership. The interviews were conducted in person or online depending on the availability and preference of the participants.

In the quantitative phase, a researcher-made questionnaire was designed based on the findings from the qualitative analysis. The instrument employed a five-point Likert scale ranging from "strongly disagree" to "strongly agree." The questionnaire aimed to validate the conceptual model developed during the qualitative phase by examining its components in a broader sample of academic department heads.

As previously mentioned, the study adopted a mixed-methods framework, and therefore the data analysis strategies were tailored to each phase. In the qualitative phase, grounded theory methodology was employed to analyze interview data. The analysis was conducted in three stages: open coding, axial coding, and selective coding. These stages facilitated the identification of core categories and the development of an initial conceptual model reflecting the essential elements of professional development based on individual coaching approaches. The analysis was iterative and relied heavily on constant comparison and memo-writing to ensure conceptual saturation and theoretical coherence.

In the quantitative phase, the statistical validation of the proposed model and its associated measurement instrument was carried out using confirmatory factor analysis (CFA). The Partial Least Squares (PLS) structural equation modeling technique was used to assess the validity and reliability of the constructs identified in the qualitative phase. This method was chosen due to its suitability for exploratory research with complex models and relatively small sample sizes. PLS-SEM helped determine the model's structural integrity, internal consistency, and convergent and discriminant validity, thus offering a robust evaluation of the conceptual framework derived from the qualitative data.

Findings and Results

The qualitative phase of this study aimed to identify and conceptualize the main components of a professional development model for academic department heads in Iranian universities, grounded in individual coaching approaches. Data were collected through semi-structured interviews with 14 academic experts and analyzed using the grounded theory method in three stages: open coding, axial coding, and selective coding. The process yielded a structured framework consisting of six core categories (conditions and consequences), each containing several subcategories. These dimensions emerged through constant comparison and iterative analysis, reflecting the complexity and interrelatedness of professional development in the academic context.

Table 1. Main Categories and Subcategories of the Conceptual Model

Main Categories	Subcategories

Contextual Conditions	Organizational Structure, Organizational Culture, Technological Infrastructure, University Performance Evaluation System, Internal Policies and Regulations
Causal Conditions	Changes in the Higher Education System, Need for Managerial Skills Development, External Pressures, Necessity to Improve Teaching and Research Quality, Inter-University Competition, Technological Advancement
Core Phenomenon	Reflective Learning, Individual-Based Coaching, Professional Ethics and Responsibility, Educational Leadership Skills
Strategies	Allocation of Adequate Financial Resources, Formation of Professional Networks for Department Heads, Coaching-Based Training Programs, Experiential Learning Opportunities, Development of Professional Development Standards
Consequences	Improvement of Department Heads' Managerial Skills, Enhancement of Teaching and Research Quality, Increased Job Satisfaction and Motivation, Strengthened Academic Collaboration, Promotion of Organizational Learning Culture, Improved Managerial Performance Evaluation System
Intervening Conditions	Personality Traits of Department Heads, Organizational Support or Neglect, Resource Limitations, Demographic Characteristics of Department Heads

The qualitative findings reveal that the professional development of department heads is a multifaceted phenomenon shaped by an interplay of internal organizational factors, external systemic forces, and individual-level attributes. The *contextual conditions* such as the structure and culture of the university, available technology, and existing policies form the environment in which leadership development unfolds. These contextual factors either enable or hinder engagement with development programs.

The *causal conditions* reflect pressures and needs driving the demand for professional development. For instance, systemic changes in higher education, growing emphasis on quality assurance in teaching and research, and increasing competition among institutions necessitate a stronger, more capable academic leadership. These needs catalyze the focus on building competencies through structured interventions.

At the heart of the model lies the *core phenomenon*—a combination of reflective learning, individual coaching, leadership skills, and a strong sense of professional ethics. These elements define the essence of the desired transformation in academic leadership. Department heads are expected to critically reflect on their performance, engage in one-on-one coaching relationships, and demonstrate accountability and leadership capacity within their units.

To operationalize this core, various *strategies* are required. These include ensuring sufficient funding for development programs, establishing peer networks, offering coaching-based training, and creating real-life learning opportunities. Moreover, professional development needs to be standardized and institutionalized within the university framework to ensure consistency and sustainability.

The implementation of these strategies leads to multiple *consequences*, including the enhancement of managerial skills and motivation, a rise in institutional collaboration, and overall improvement in academic and research outputs. These outcomes also feed back into the system, creating a culture of continuous learning and development.

However, the process is moderated by several *intervening conditions*, such as individual personality traits, demographic variables, and the degree of organizational support. The findings suggest that without adequate attention to these moderating factors—particularly institutional support and resource allocation—even the most well-designed development programs may fail to achieve their intended impact.

Overall, the qualitative phase resulted in a grounded, context-sensitive, and strategically informed conceptual model that serves as a foundation for designing and validating professional development interventions based on individual coaching for department heads in higher education institutions.

In this section, the results of confirmatory factor analysis (CFA) for the six major components of the proposed professional development model—namely, causal conditions, core phenomenon, contextual conditions, intervening conditions, strategies, and consequences—are presented. For each component, two types of CFA outputs are reported: (1) standardized path

coefficients (factor loadings) between observed and latent variables and (2) the significance values (t-values) of those coefficients. These results were obtained using Partial Least Squares Structural Equation Modeling (PLS-SEM).

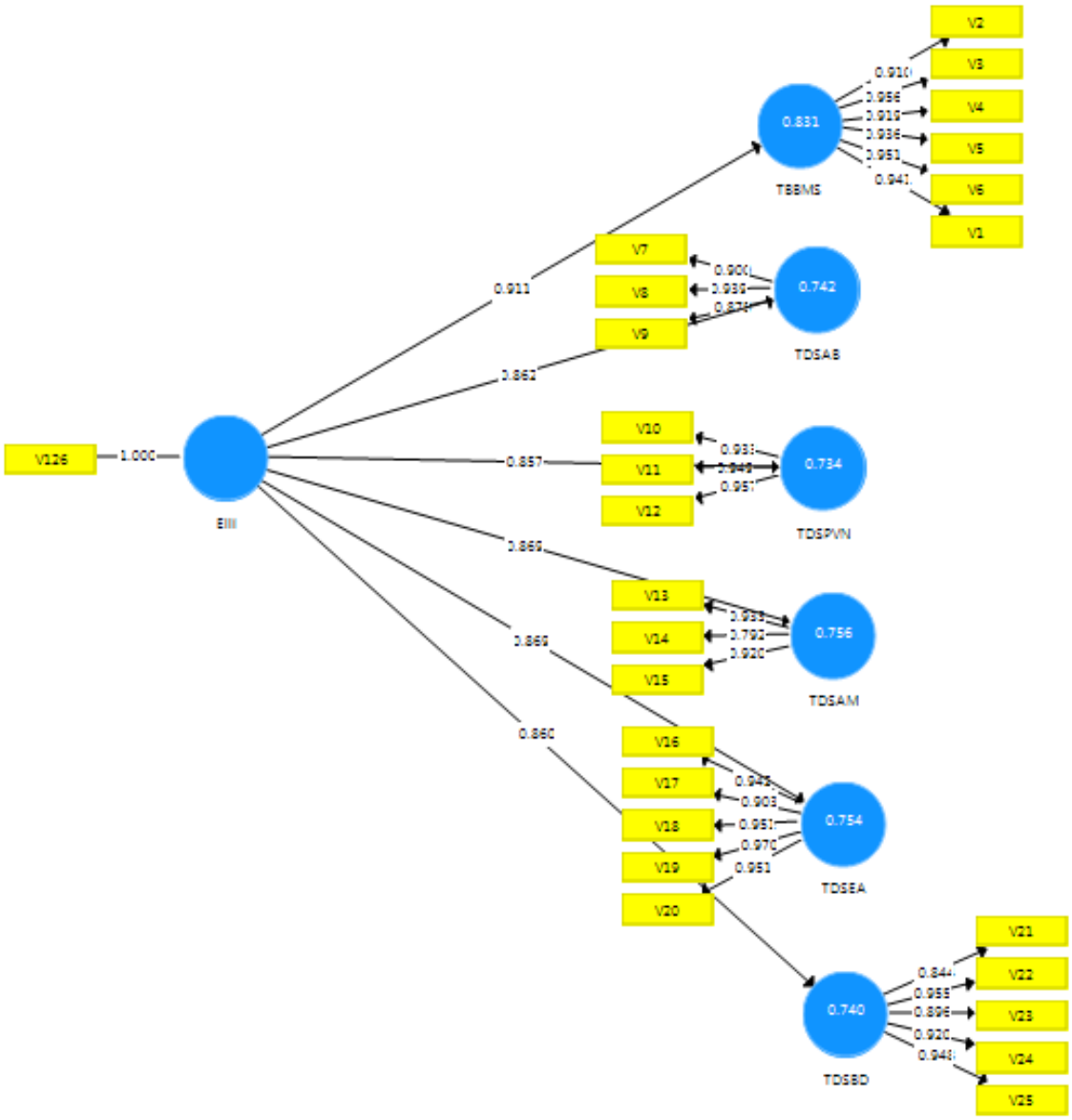

Figure 1. Path Coefficients for the Causal Conditions Component

The factor loadings between the observed indicators and the latent construct of causal conditions were found to be greater than 0.3 across all paths. Some of the coefficients fell in the range of 0.3 to 0.6, indicating moderate relationships, while others exceeded 0.6, reflecting strong associations. These findings suggest that indicators such as "changes in the higher education system," "external pressures," and "technological advancement" are substantially representative of the underlying causal dimension.

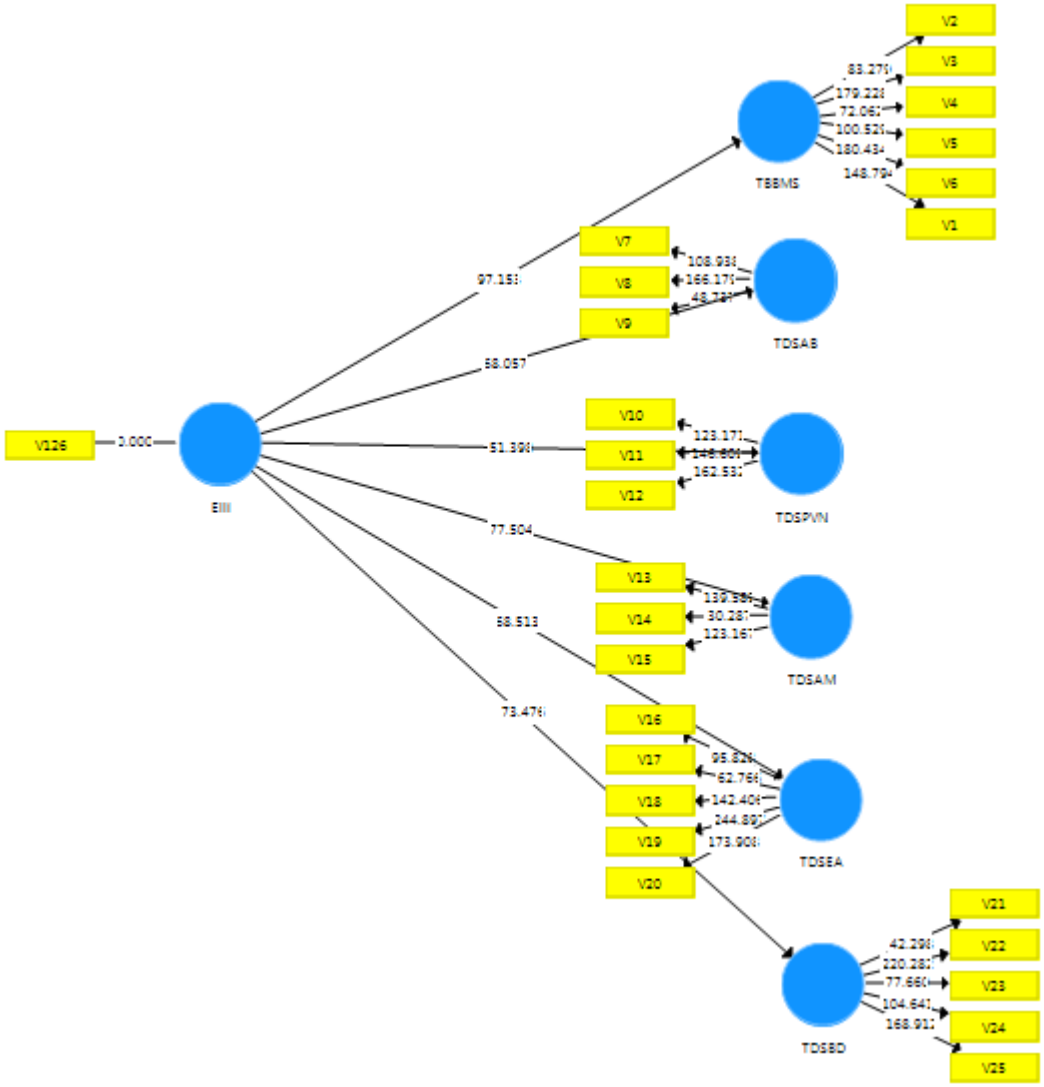

Figure 2. Significance Values for the Causal Conditions Component

The significance values (t-values) for the path coefficients associated with causal conditions were all above the critical threshold of 1.96, confirming the statistical significance of the observed relationships. This indicates that all indicators meaningfully contribute to defining the causal conditions component within the model.

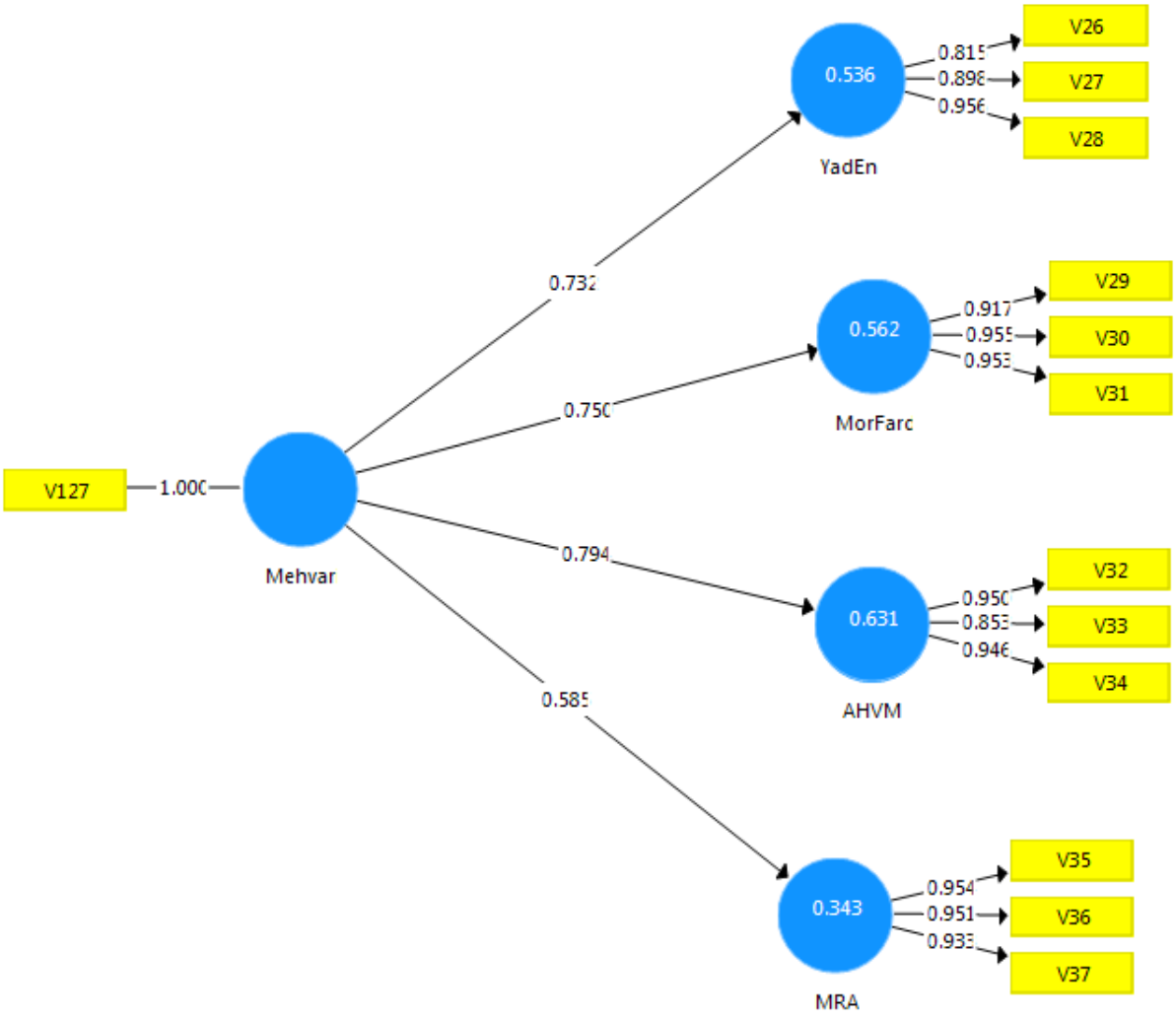

Figure 3. Path Coefficients for the Core Phenomenon Component

The path coefficients between the core phenomenon and its indicators—such as "reflective learning," "individual-based coaching," "professional ethics," and "educational leadership skills"—were all above 0.3. Moderate to strong relationships were observed, supporting the reliability of the latent construct.

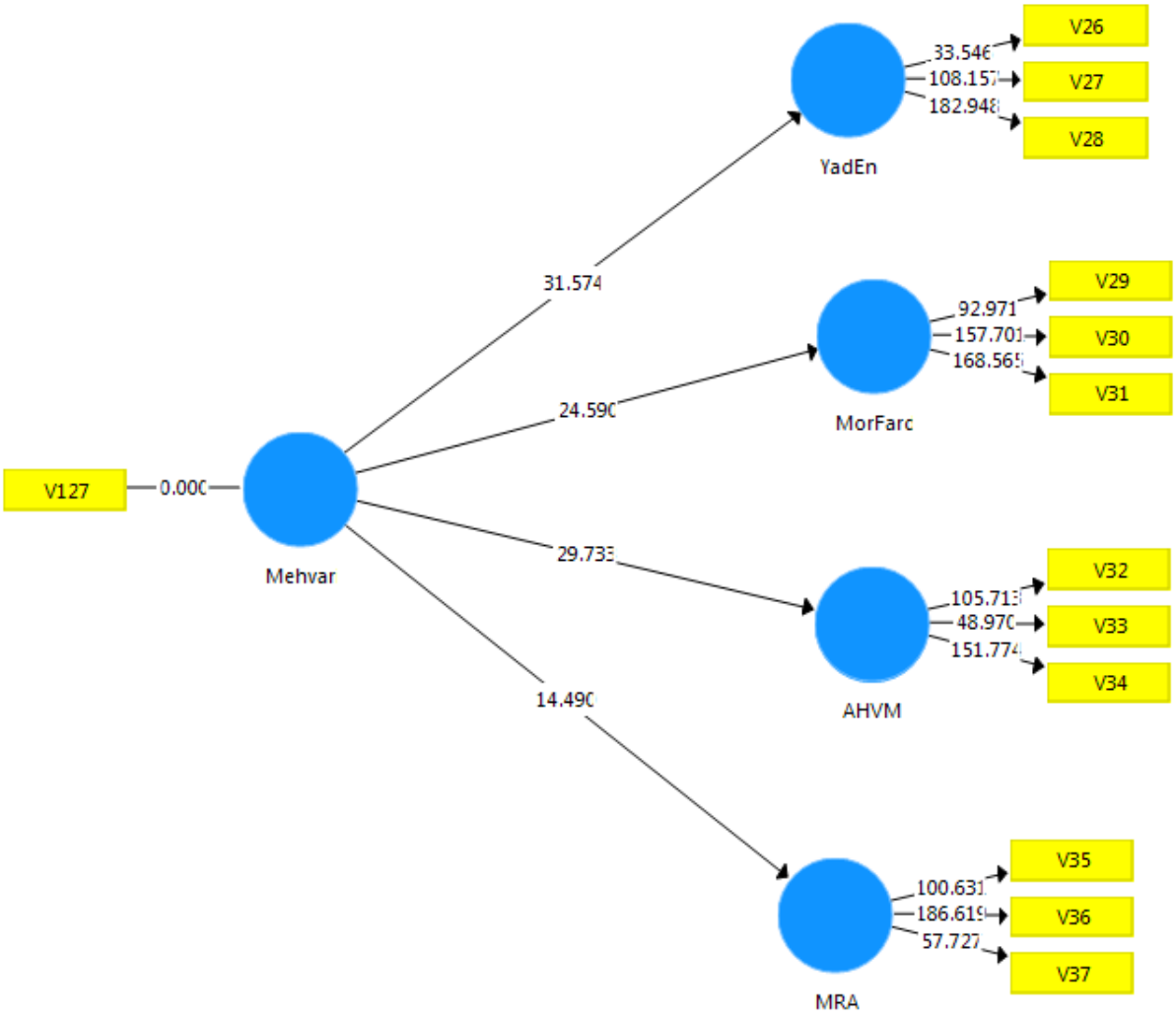

Figure 4. Significance Values for the Core Phenomenon Component

The corresponding significance values all exceeded 1.96, verifying the meaningfulness of the observed relationships. Therefore, the core phenomenon was statistically validated as a central construct in the model.

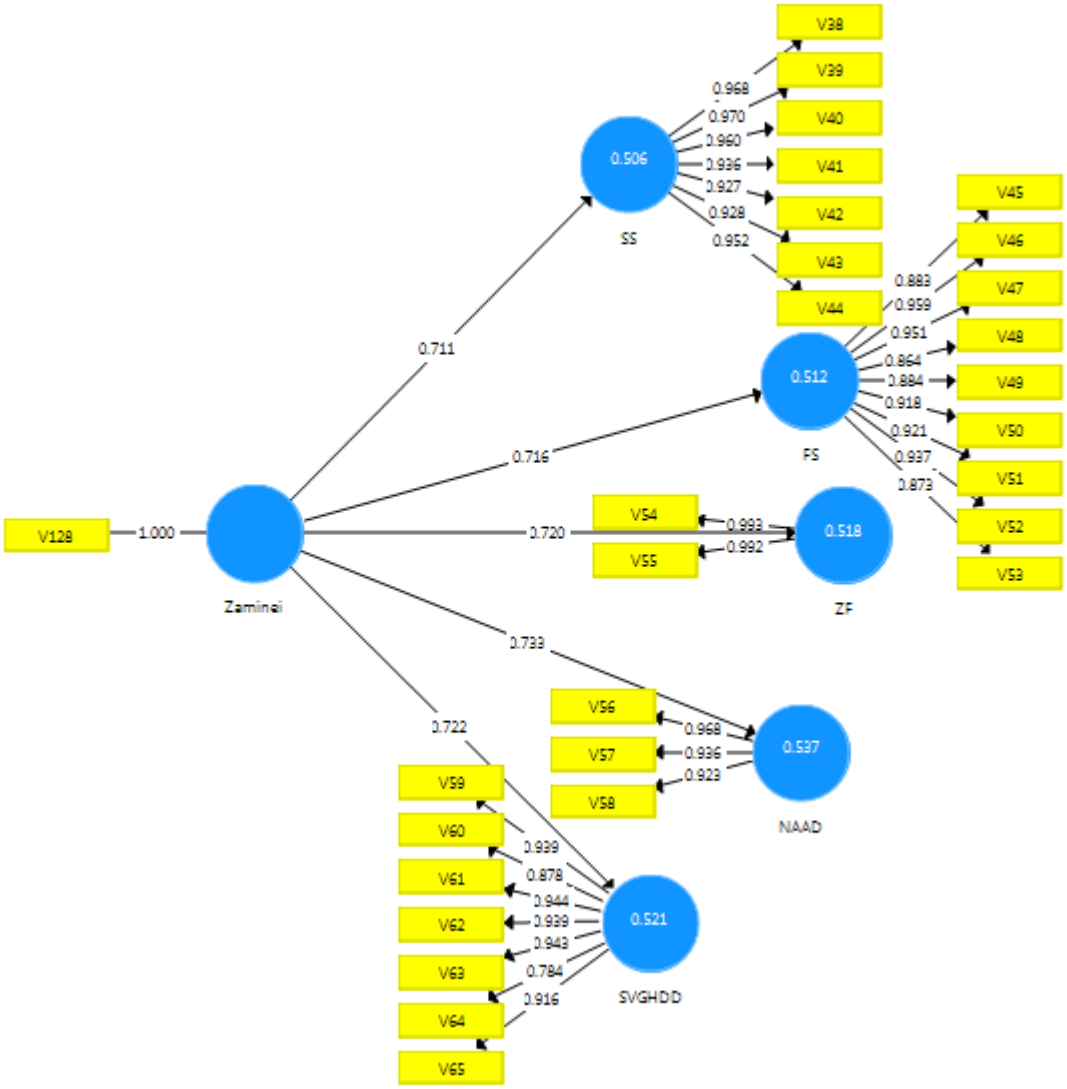

Figure 5. Path Coefficients for the Contextual Conditions Component

All factor loadings related to contextual conditions were higher than 0.3. The indicators—including "organizational structure," "organizational culture," and "technological infrastructure"—exhibited moderate (0.3–0.6) to strong (above 0.6) associations with their underlying construct.

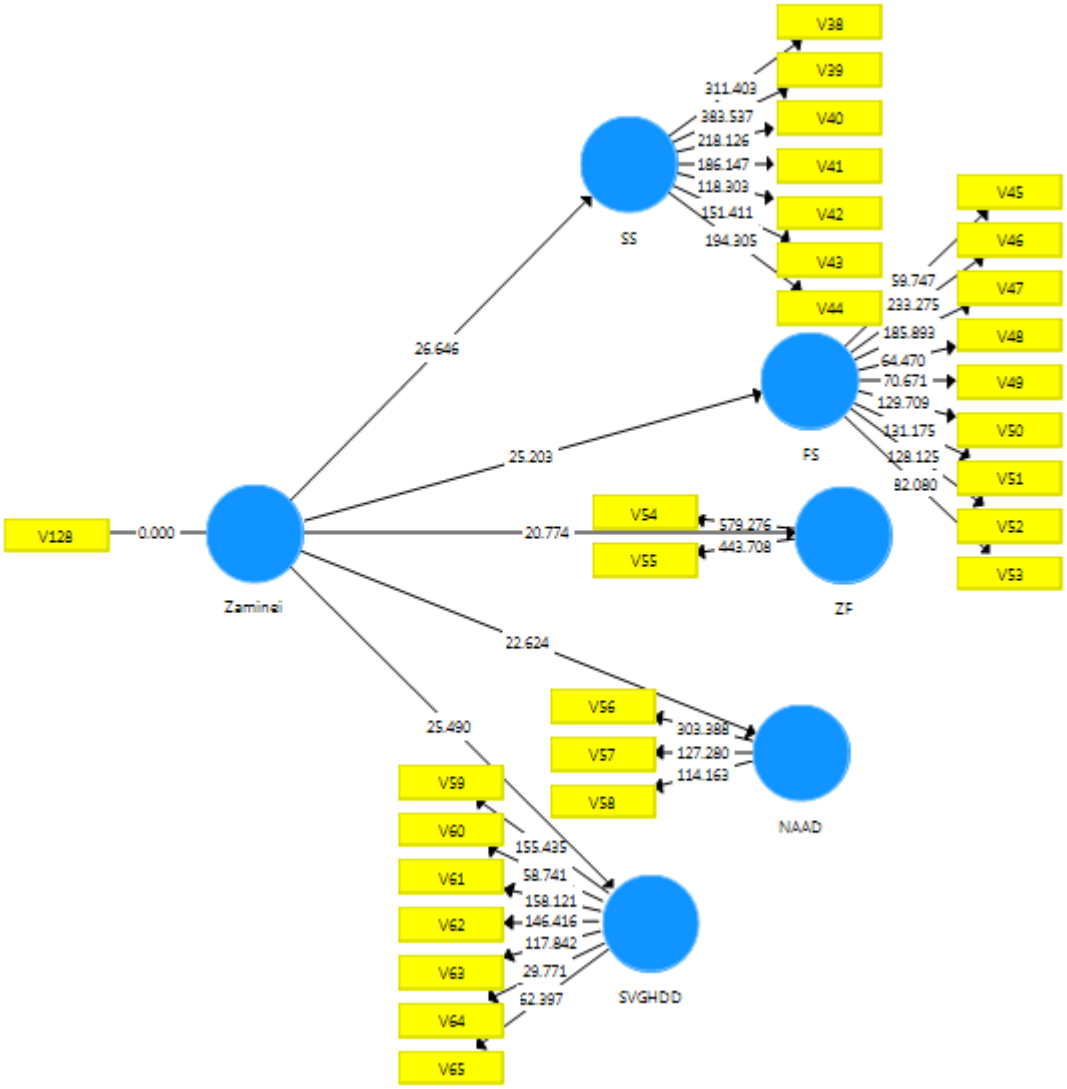

Figure 6. Significance Values for the Contextual Conditions Component

The t-values for all relationships were above 1.96, confirming their statistical significance. Thus, the contextual conditions construct was supported by solid empirical evidence.

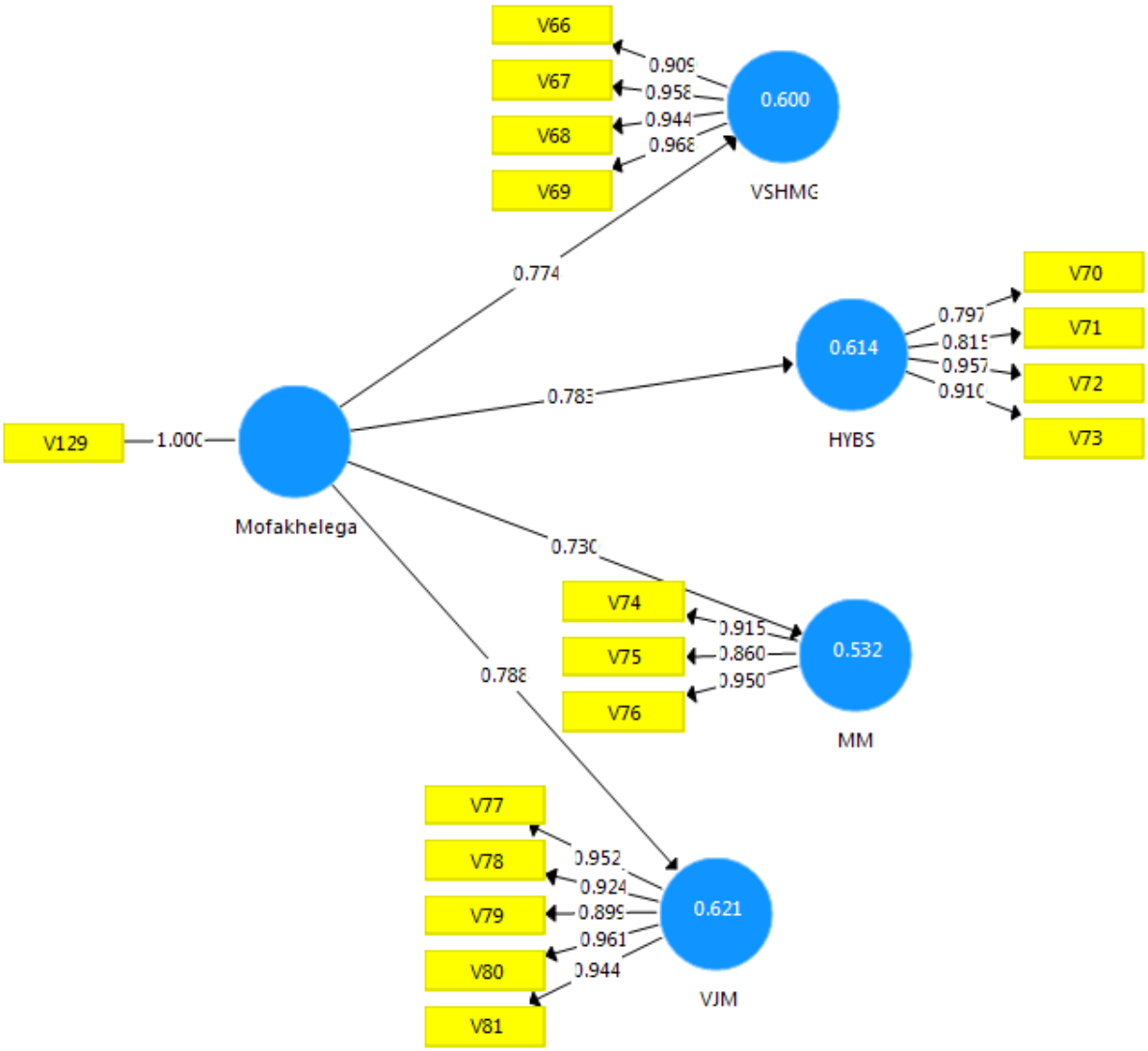

Figure 7. Path Coefficients for the Intervening Conditions Component

For intervening conditions, the factor loadings of all observed indicators were again higher than 0.3. Elements such as "personality traits of department heads," "organizational support," and "demographic characteristics" demonstrated both moderate and strong linkages with the latent construct.

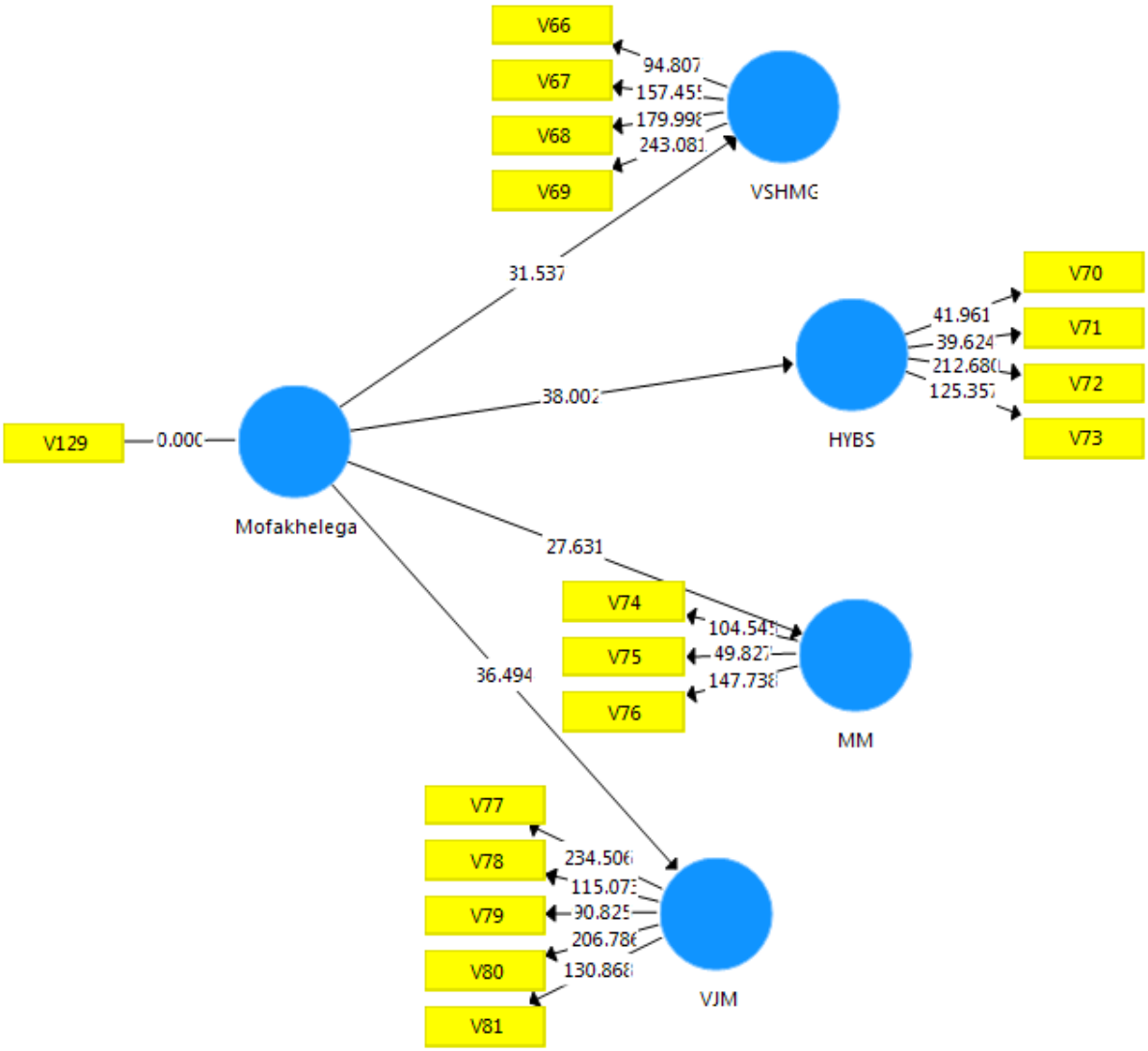

Figure 8. Significance Values for the Intervening Conditions Component

As shown in this figure, all significance values surpassed the 1.96 threshold. This validates the role of intervening conditions as a meaningful component of the overall model.

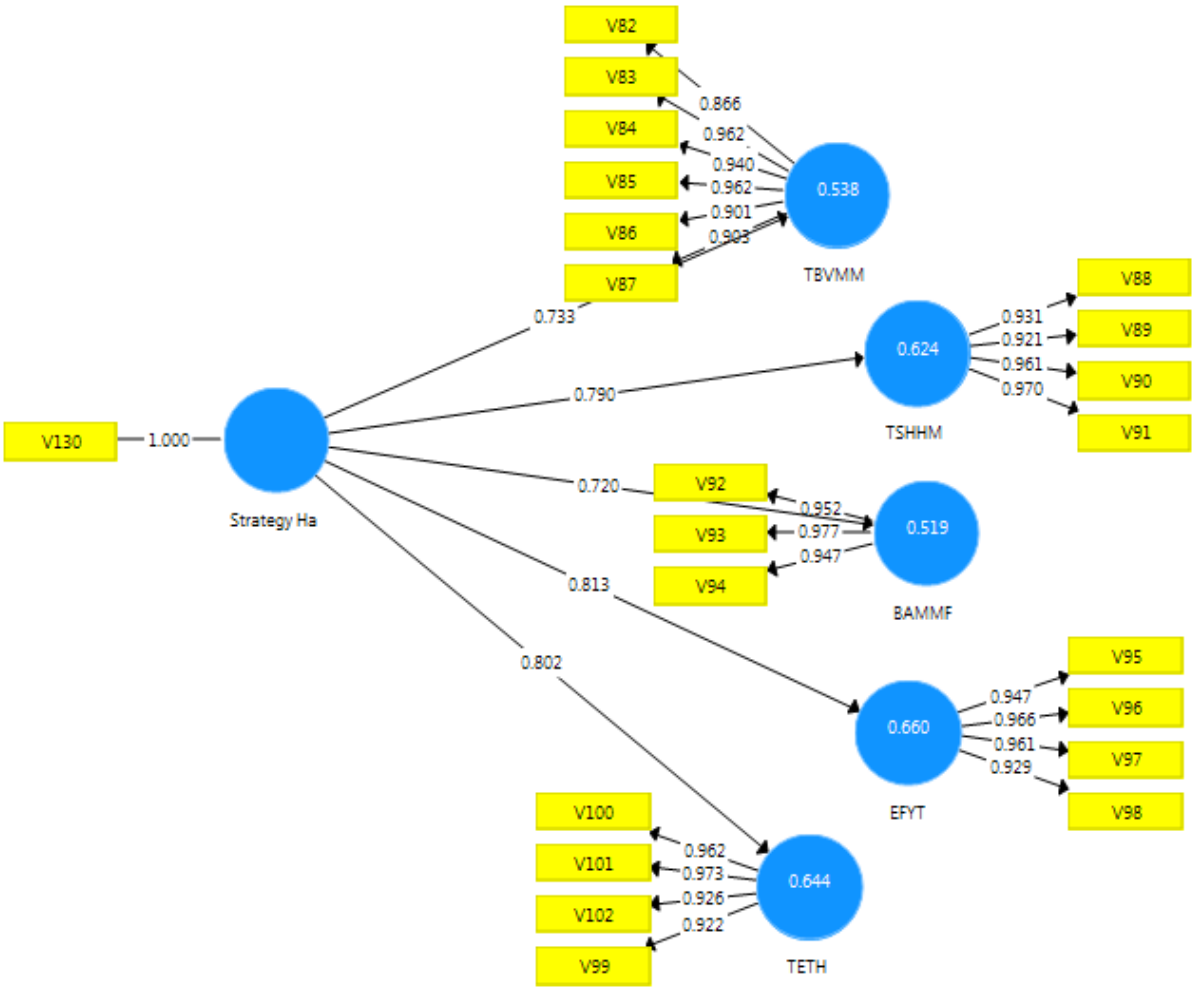

Figure 9. Path Coefficients for the Strategies Component

The component of strategies yielded path coefficients exceeding 0.3 for all associated items. These include "allocation of sufficient resources," "formation of professional networks," and "coaching-based training programs." The relationships ranged from moderate to strong.

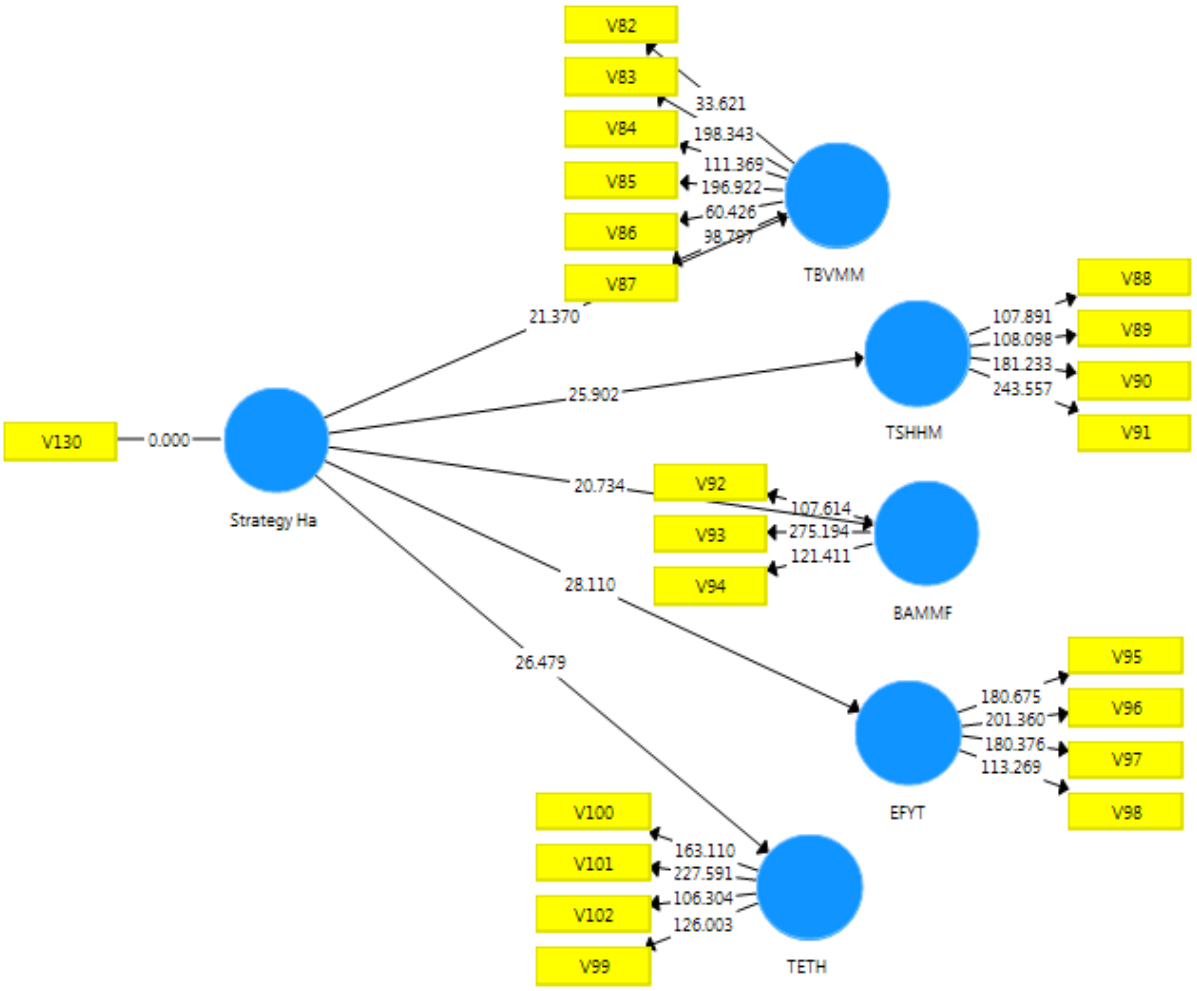

Figure 10. Significance Values for the Strategies Component

The significance levels were again all greater than 1.96, indicating that these indicators reliably measure the underlying latent construct of strategies within the model.

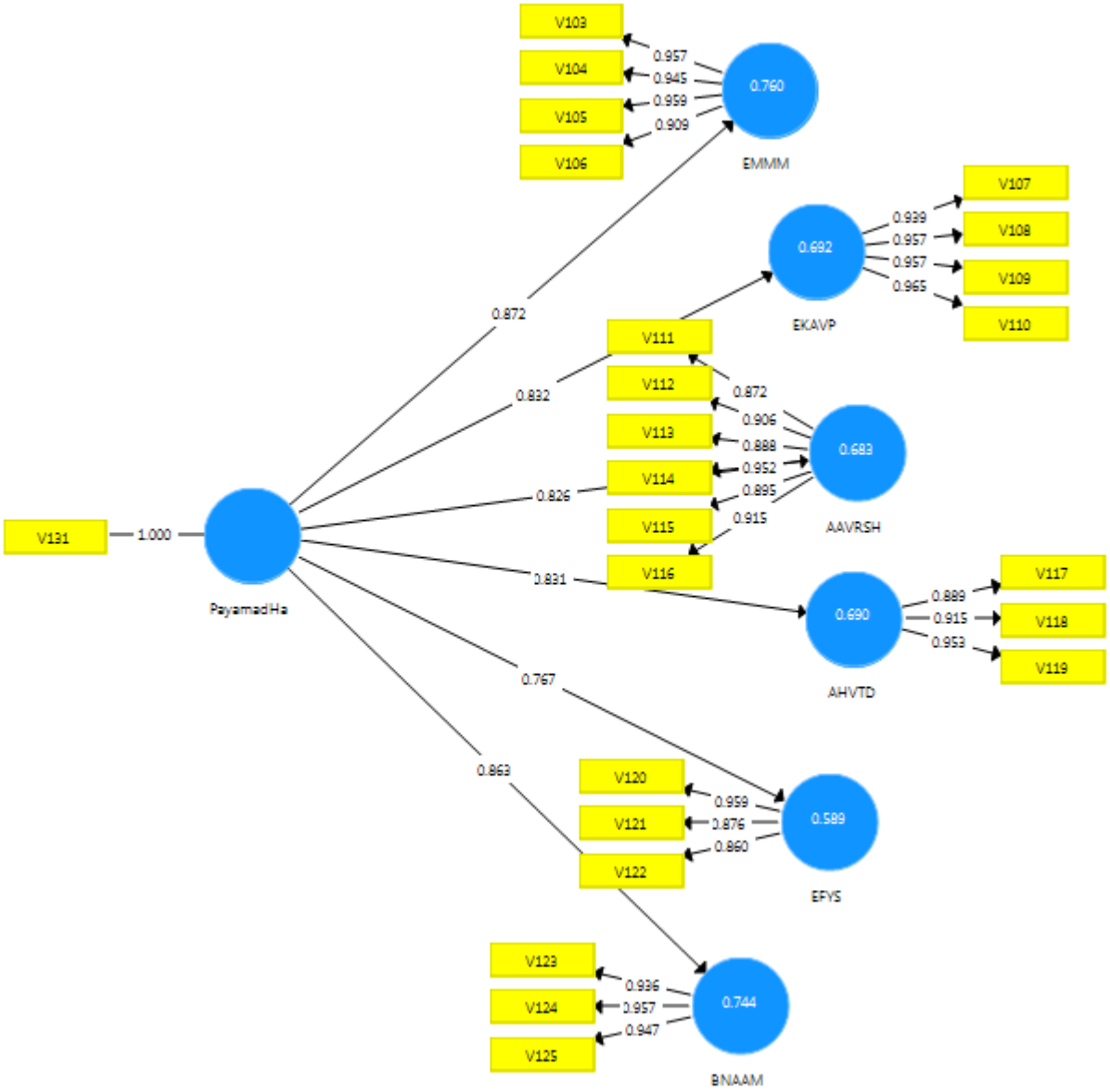

Figure 11. Path Coefficients for the Consequences Component

For the consequences component, the factor loadings between indicators and the latent variable were all above 0.3, with several surpassing 0.6. This implies that indicators such as "improvement of managerial skills," "enhanced teaching quality," and "increased job satisfaction" are strongly aligned with the conceptual definition of consequences.

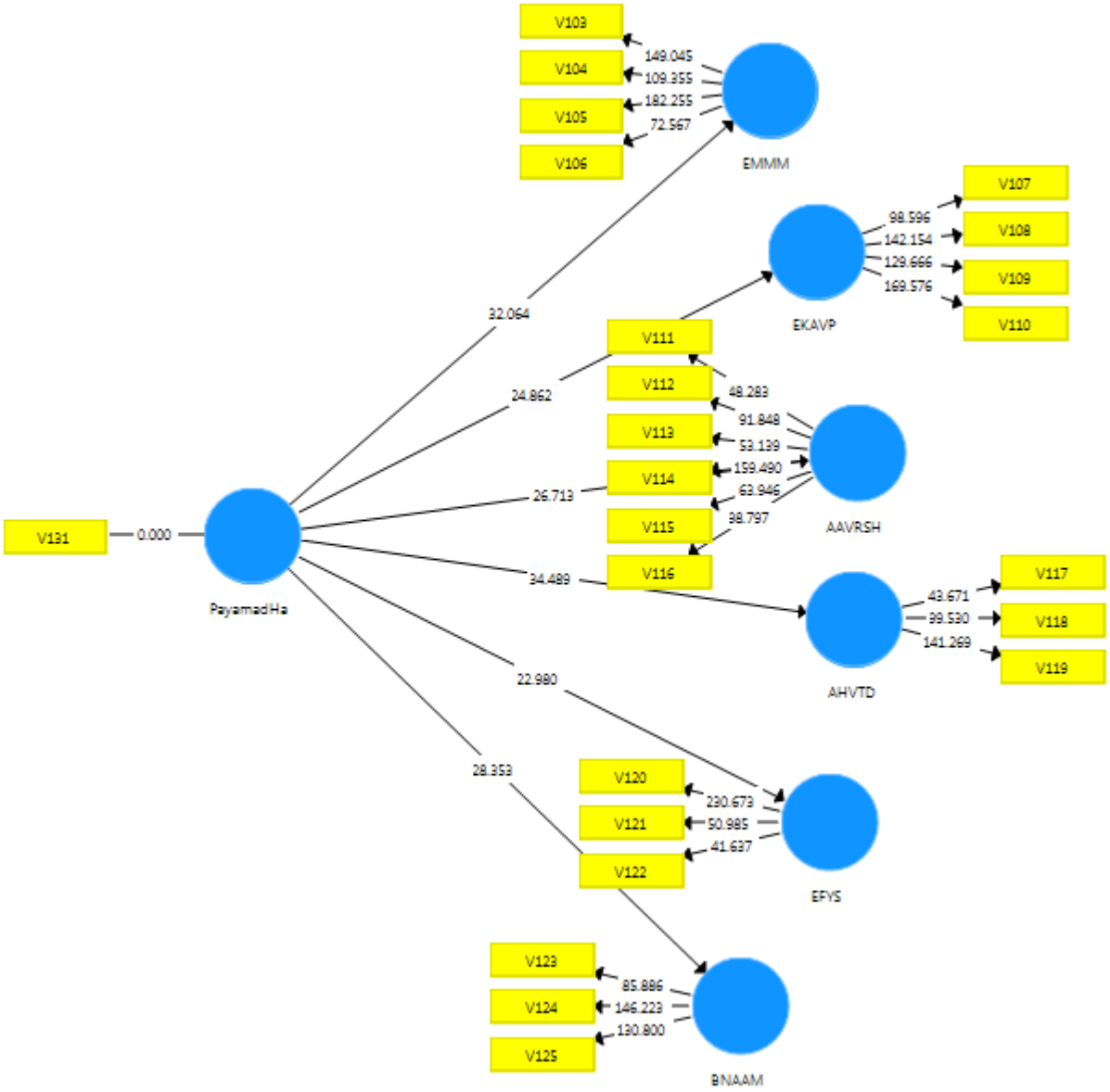

Figure 12. Significance Values for the Consequences Component

All associated t-values were greater than 1.96, confirming the statistical significance of these relationships. The component of consequences, therefore, holds a validated position in the model.

Table 2. SRMR Values for Model Fit Evaluation

Component	SRMR Value
Causal Conditions	0.056
Intervening Conditions	0.073
Contextual Conditions	0.056
Core Phenomenon	0.058
Consequences	0.065
Strategies	0.055

The Standardized Root Mean Square Residual (SRMR) values presented in Table 2 reflect the overall goodness-of-fit indices for each latent variable in the proposed model. SRMR is commonly used in Partial Least Squares Structural Equation Modeling (PLS-SEM) to assess the discrepancy between the observed correlation matrix and the model-implied correlation matrix. In general, SRMR values below 0.08 indicate acceptable model fit.

As the table shows, all six model components demonstrated SRMR values well below the 0.08 threshold, suggesting a satisfactory fit between the hypothesized model and the empirical data. The component of "intervening conditions" exhibited the highest SRMR (0.073), which still falls within the acceptable range, albeit closer to the upper limit. The lowest SRMR was observed for "strategies" at 0.055, indicating a particularly strong model fit for that construct. These findings collectively support the structural soundness and validity of the measurement model for professional development among department heads based on individual coaching approaches.

Table 3. R^2 Values for Latent Variables Across All Model Components

Component	Latent Variable	R^2 Value
Causal Conditions	TBBMS	0.831
	TDSAB	0.472
	TDSAM	0.756
	TDSBD	0.740
	TDSEA	0.754
	TDSPVN	0.733
Intervening Conditions	HYBS	0.614
	MM	0.532
	VJM	0.621
	VSHMG	0.600
Contextual Conditions	FS	0.512
	NAAD	0.537
	SS	0.506
	SVGHDD	0.521
	ZF	0.518
Core Phenomenon	YadEn	0.713
	MorFarc	0.705
	AHVM	0.634
	MRA	0.629
Consequences	AAVRSH	0.683
	AHVTD	0.690
	BNAAM	0.744
	EFYS	0.589
	EKAVP	0.692
	EMMM	0.760
Strategies	BAMMF	0.519
	EFYT	0.660
	TBVMM	0.538
	TETH	0.644
	TSHHM	0.624

The R^2 values presented in Table 3 offer insight into the explanatory power of the model components in predicting their respective latent variables. In the causal conditions domain, the highest R^2 value was associated with TBBMS (0.831), indicating a very strong level of variance explanation. Similarly, several other variables within this component—such as TDSAM (0.756) and TDSEA (0.754)—showed high explanatory power, demonstrating the robustness of causal mechanisms in shaping the core model.

In the domain of intervening conditions, the R^2 values ranged from moderate to strong, with VJM (0.621) and HYBS (0.614) standing out as well-predicted constructs. The contextual conditions component showed relatively moderate R^2 values (all around 0.50–0.54), indicating that while these variables are relevant, their predictive strength is somewhat more modest.

The core phenomenon variables showed strong R^2 values, particularly YadEn (0.713) and MorFarc (0.705), reflecting the centrality of reflective learning and individual coaching in the model. Likewise, the consequences component yielded some of the highest R^2 scores overall, especially for EMMM (0.760) and BNAAM (0.744), suggesting that the model is particularly effective in accounting for developmental outcomes in professional practice.

Finally, strategy-related variables demonstrated good predictive strength, with EFYT (0.660) and TETH (0.644) leading the set. These findings collectively affirm the structural integrity and predictive capability of the proposed model, supporting its use in planning and evaluating professional development programs based on individual coaching in academic institutions.

Table 4. RMS Theta Values for Model Fit Assessment

Component	RMS Theta Value
Causal Conditions	0.303
Intervening Conditions	0.311
Contextual Conditions	0.286
Core Phenomenon	0.287
Consequences	0.342
Strategies	0.283

Root Mean Square Theta (RMS Theta) is a model fit index used in Partial Least Squares Structural Equation Modeling (PLS-SEM) to evaluate the degree of correlation among residuals in a reflective measurement model. Values below 0.12 typically suggest poor fit, while values closer to 0.36 or lower indicate acceptable to good model specification. As shown in Table 4, all RMS Theta values for the model components fall well below the 0.36 threshold, confirming an acceptable degree of model fit. The lowest RMS Theta value was observed in the strategies component (0.283), followed closely by contextual conditions (0.286) and core phenomenon (0.287), indicating particularly strong model consistency for these constructs. Although the consequences component had the highest RMS Theta value (0.342), it still remained within the acceptable range, implying no serious model misfit. Overall, the RMS Theta results reinforce the reliability of the proposed measurement model across all theoretical dimensions.

Table 5. Effect Size Index (f^2) for Model Variables Across All Components

Component	Variable	Effect Size (f^2)
Causal Conditions	TDSPVN	2.764
	TDSEA	3.071
	TDSBD	2.085
	TDSAM	3.097
	TDSAB	2.882
	TBBMS	4.902
Intervening Conditions	VSHMG	1.497
	VJM	1.642
	MM	1.139
	HYBS	1.587
Contextual Conditions	ZF	3.071
	SVGHDD	2.085
	SS	3.097
	NAAD	2.882
	FS	4.902
Core Phenomenon	MRA	1.826
	AHVM	2.248
	MorFarc	3.344
	YadEn	1.337
Consequences	EMMM	3.164
	EKAVP	2.248
	EFYS	1.431
	BNAAM	2.906
	AHVTD	2.231
	AAVRSH	2.152
Strategies	TSHHM	1.662
	TETH	1.808
	TBVMM	1.163
	EFYT	1.944
	BAMMF	1.079

The values in Table 5 represent the effect size index (f^2) for each observed variable within its respective model component. Effect size indicates the relative contribution of each variable to the explanation of variance in the structural model. According to established benchmarks, an f^2 value above 0.35 is considered large, above 0.15 is moderate, and above 0.02 is small—though in models involving complex constructs and multivariate paths, values exceeding 1.0 suggest very strong contributions.

In the causal conditions component, all variables demonstrated very high effect sizes, particularly TBBMS (4.902), TDSAM (3.097), and TDSEA (3.071), confirming their critical role in explaining the variance in this domain. The intervening conditions also showed moderate to strong effect sizes, with VJM (1.642) and HYBS (1.587) emerging as the most influential.

Within the contextual conditions category, the variables FS (4.902), SS (3.097), and ZF (3.071) displayed very strong effect sizes, affirming their foundational importance in structuring professional development dynamics. The core phenomenon section also yielded substantial contributions, especially MorFarc (3.344) and AHVM (2.248), reflecting the central role of professional ethics and individual coaching in the model.

In the consequences component, variables such as EMMM (3.164), BNAAM (2.906), and EKAVP (2.248) showed robust explanatory power, highlighting the significant outcomes associated with well-executed development strategies. Finally, the strategies domain reported consistently high effect sizes as well, with EFYT (1.944) and TETH (1.808) contributing most prominently.

Overall, the high f^2 values across all domains indicate that the measurement model possesses not only internal validity but also strong explanatory strength, reinforcing the robustness and practical relevance of the proposed model of professional development through individual coaching.

Discussion and Conclusion

This study aimed to design and validate a professional development model for academic department heads in Iranian universities grounded in individual coaching approaches. Using a mixed-methods design, the research identified six principal components—causal conditions, contextual conditions, intervening conditions, core phenomenon, strategies, and consequences—that collectively provide a robust framework for understanding and implementing coaching-based leadership development in higher education. The results of the confirmatory factor analysis showed that the relationships between observed and latent variables were strong, with factor loadings exceeding the minimum acceptable thresholds. Model fit indices, including SRMR and RMS Theta, confirmed the structural validity of the model, while high R^2 and f^2 values demonstrated the predictive power of the variables and the explanatory strength of the framework.

The qualitative phase of the study revealed that causal drivers such as systemic changes in higher education, increasing pressure to enhance quality, inter-university competition, and rapid technological advancements are pushing academic institutions to invest in leadership development. These findings are consistent with studies that highlight how the shifting landscape of higher education necessitates a more strategic, adaptive, and reflective leadership style (1, 2). Similarly, previous research has shown that the need to respond to institutional complexity, manage performance expectations, and align departmental objectives with national educational priorities demands more than traditional managerial training (10).

At the core of the validated model lies the phenomenon of individual-based coaching, supported by dimensions such as reflective learning, educational leadership skills, and professional ethics. Quantitative results confirmed the central role of these constructs, with high factor loadings and significant path coefficients. These outcomes align closely with contemporary literature emphasizing the transformative potential of coaching in academic settings (4, 5). Coaching is increasingly seen as a personalized and dialogic process that empowers leaders to set meaningful goals, improve decision-making, and cultivate

relational leadership competencies (6, 7). The findings of this study reinforce the argument that individual coaching is not merely a complementary mechanism but a central pillar of effective leadership development in universities.

Contextual conditions—including organizational structure, culture, performance evaluation mechanisms, internal regulations, and technological infrastructure—were also validated as significant contributors, though with moderate explanatory power. These elements form the institutional environment within which coaching operates, influencing its accessibility, implementation, and effectiveness. The literature supports this conclusion, indicating that institutional factors can either facilitate or obstruct the success of coaching initiatives (12, 17). For example, universities with rigid hierarchies and limited cultural openness to reflective practices may struggle to sustain coaching as a development tool (5). Conversely, institutions that prioritize continuous learning, collaborative governance, and performance-based evaluations tend to support more successful coaching interventions (8).

Intervening conditions, such as personal characteristics of department heads, organizational support or neglect, resource limitations, and demographic features, were also shown to significantly impact the coaching process. Although these factors had lower R^2 values than the core and outcome constructs, their effect sizes were substantial, suggesting that they meaningfully shape the outcomes of coaching interventions. These findings are supported by earlier studies that link leadership effectiveness to personal and situational moderators (15, 20). For instance, personality traits such as openness, emotional intelligence, and resilience have been found to influence how faculty leaders respond to coaching (9).

Strategic components—such as allocation of financial resources, formation of peer learning networks, development of experiential learning opportunities, and the establishment of professional development standards—demonstrated high predictive value. These strategies emerged as vital enablers of the coaching process, serving to institutionalize and operationalize its principles. The importance of these structural elements is emphasized in studies advocating for competency-based and performance-driven educational leadership models (13, 16). Coaching-based development is most effective when embedded in a supportive ecosystem that includes well-defined standards, institutional incentives, and platforms for collaborative learning (14, 19).

The "consequences" component yielded the highest R^2 and f^2 values in the model, indicating that the proposed framework effectively predicts key professional development outcomes such as improved managerial skills, enhanced teaching and research quality, increased motivation and job satisfaction, greater academic collaboration, and a stronger organizational learning culture. These outcomes echo the findings of prior meta-analyses which confirm that coaching-based faculty development programs lead to sustained improvement in individual performance and institutional productivity (4, 11). Specifically, the enhancement of reflective and leadership competencies has been shown to correlate positively with increased faculty engagement, improved conflict resolution, and more innovative academic governance (2, 18).

Overall, the integration of the qualitative and quantitative findings presents a compelling case for adopting coaching as a core strategy in faculty leadership development. The model's six dimensions are theoretically aligned with international best practices in academic coaching and empirically validated in the context of Iranian higher education. The model also aligns with broader efforts to reform higher education management by shifting from top-down control to participatory and reflective leadership paradigms (1, 3). Moreover, the study contributes to the growing body of scholarship that supports evidence-based approaches to faculty development and highlights coaching's potential to transform institutional culture from within.

Despite the strengths of this study, several limitations should be acknowledged. First, the sample was limited to non-medical academic departments, which may restrict the generalizability of the findings to medical faculties or technical institutions that operate under different regulatory and cultural norms. Second, although the qualitative sample achieved theoretical saturation, the limited number of expert participants may have constrained the range of perspectives included in model construction. Third,

while Partial Least Squares Structural Equation Modeling (PLS-SEM) is appropriate for exploratory and predictive modeling, it does not capture multilevel or hierarchical structures, which may be present in academic organizational settings.

Future research should aim to expand the scope of validation across diverse academic environments, including medical and private universities, as well as international contexts with different educational governance models. Comparative cross-national studies could further illuminate how coaching practices vary depending on policy, culture, and institutional structure. Additionally, longitudinal studies are needed to track the long-term effects of coaching interventions on academic leadership, organizational performance, and faculty retention. Emerging technologies, such as virtual coaching platforms and AI-assisted development tools, also warrant investigation, particularly in light of increasing digitization and hybrid leadership practices.

In practical terms, higher education institutions should take deliberate steps to incorporate coaching into their professional development strategies. This includes establishing formal coaching programs, training internal and external coaches, allocating sufficient resources, and integrating coaching outcomes into faculty performance evaluations. Universities should embed coaching into their strategic planning and ensure alignment with institutional goals and cultural values. Faculty leaders must be empowered to engage in reflective practices and ongoing development through structured coaching relationships, creating a culture of continuous learning and shared leadership. The validated model presented in this study offers a practical, research-based roadmap for achieving these outcomes.

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Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

All ethical principles were adheried in conducting and writing this article.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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