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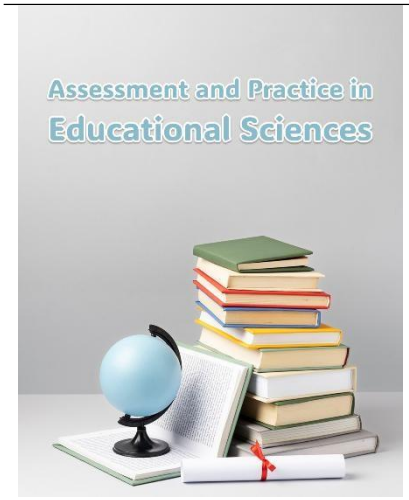

Identification and Analysis of Factors Influencing the Development of Research Competencies among Faculty Members in Iraqi Universities

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ABSTRACT

The purpose of this study was to identify and analyze the components influencing the development of research competencies among faculty members in Iraqi universities. This applied research was conducted using a descriptive–analytical approach, and data were collected through a researcher-made questionnaire administered to 333 faculty members. To analyze the data and rank the components, the Friedman test was employed to determine the priority and relative importance of each component across six main categories: causal factors, research competencies, contextual conditions, intervening conditions, strategies, and outcomes. The findings indicated that among the causal factors, professional requirements and motivational factors held the greatest importance and played a key role in shaping the research behavior of faculty members. Within the research competency components, research ethics and methodological knowledge were of higher significance, emphasizing adherence to ethical principles and mastery of scientific methods as fundamental pillars of research capability. Furthermore, within the contextual conditions, the scientific–educational environment had the highest importance, underscoring the vital role of research infrastructure and resources in enhancing the quality of scholarly activities. Among the intervening conditions, organizational barriers were identified as the main impediment, while within the strategy components, educational and motivational strategies had the most substantial effect on improving research competency. Finally, the individual outcomes for researchers were highly significant, demonstrating that the development of research competencies not only enhances professional performance but also increases motivation, self-confidence, and the ability to supervise students effectively. The results of this study highlight the necessity of a comprehensive and multidimensional approach to research empowerment among faculty members and can serve as a practical framework for planning, enhancing research competencies, and evaluating research performance in Iraqi universities.

Keywords: Research competency; Faculty members; Friedman test; Causal factors; Development strategies; Individual outcomes

Introduction

Research competencies have become a core pillar of academic performance, institutional productivity, and national innovation capacity, particularly in higher education systems that seek to strengthen their global visibility and societal impact. Across international contexts, universities increasingly recognize that the ability of faculty members to design, conduct, evaluate, and disseminate high-quality research directly affects both knowledge production and academic reputation. As higher education systems face rapid transformations—including digitalization, cross-border collaboration, and the integration of artificial intelligence—the development of research competencies has gained unprecedented prominence in academic policy and management discourse (1). Within this global context, strengthening research competencies is essential not only for fostering scientific advancement but also for responding to the societal, economic, and cultural needs that shape modern university missions (2).

Research competencies encompass a broad range of cognitive, methodological, ethical, and technological skills that enable researchers to engage in systematic inquiry and contribute meaningfully to scientific communities. The international literature conceptualizes these competencies as multidimensional constructs that include methodological literacy, analytical thinking, scientific writing, research ethics, creativity, innovation, and the capacity for collaborative problem-solving (3). In educational settings, developing such competencies is viewed as foundational for both students and faculty, shaping the quality of teaching, the effectiveness of mentorship, and the overall culture of academic scholarship (4). These competencies are also essential for future academic leaders, who must navigate increasingly complex research environments characterized by interdisciplinary teams, digital platforms, and global research networks (5).

Research conducted in diverse regions highlights the critical role of structured competency development across undergraduate, graduate, and faculty levels. Studies emphasize that exposure to systematic research training through coursework, practical exercises, and guided mentorship significantly enhances the capacity of individuals to engage in scholarly inquiry (6). For academic staff, research competencies are not merely technical proficiencies but integral professional attributes linked to job satisfaction, academic identity, and intellectual autonomy (7). As universities adopt competency-based frameworks for faculty development, the emphasis on enhancing methodological competence, ethical awareness, and research productivity becomes a strategic priority for institutional growth (8).

In the Middle Eastern context, particularly within Iraq, higher education institutions continue to face structural, organizational, and contextual barriers that impede the full realization of research capacity among faculty members. Governance challenges, resource constraints, outdated policies, limited international collaboration, and insufficient research infrastructure remain persistent obstacles to strengthening academic performance (9). These systemic issues limit the ability of faculty to access research funding, engage with global academic communities, and maintain consistent scientific output. Consequently, Iraqi universities are increasingly focusing on building internal mechanisms that promote research skill development, allocate resources effectively, and create supportive environments for academic inquiry.

While global scholarship underscores the need for structured approaches to developing research competencies, the specific challenges confronting faculty in developing countries—including organizational instability, inconsistent policy implementation, and socio-political constraints—require contextualized analysis (10). Studies examining Iranian and Iraqi universities reveal that barriers such as insufficient research culture, inadequate mentorship, lack of incentives, and conflicting administrative expectations substantially hinder research engagement and competency development (11). These findings demonstrate the importance of identifying motivational, organizational, and environmental factors that shape faculty members' research behaviors, particularly in contexts where higher education systems are undergoing rapid reform.

International literature further highlights the central role of institutional culture and research climate in fostering academic skills. A supportive institutional environment—characterized by mentorship programs, collaborative research networks, professional development opportunities, and equitable access to resources—is strongly associated with higher research productivity (12). Conversely, environments marked by excessive administrative burden, lack of recognition, and restricted autonomy tend to diminish faculty motivation and impede competency development. Understanding how institutional factors influence research performance is especially critical in transitional higher education systems such as Iraq's, where universities are striving to rebuild academic capacity in post-conflict settings (13).

The emergence of artificial intelligence and digital technologies further reshapes expectations for academic research competencies. Scholars stress the need for researchers to develop competencies related to data literacy, digital scholarship, and technology-mediated research practices (14). Recent work on the ethics and boundaries of AI use in scientific writing argues that faculty must possess the competence to evaluate, integrate, and regulate the use of AI tools in research, particularly as academic integrity concerns evolve (15). These technological shifts make research competency development not only a professional requirement but also a necessity for maintaining ethical standards and responsible scientific practice (16).

Cross-disciplinary studies highlight the universality of research competencies across professional fields. In health sciences, research competencies are described as essential for evidence-based practice, clinical decision-making, and patient-centered care (17). Similarly, in teacher education, competencies related to research-based inquiry and reflective practice are foundational for preparing educators to engage in continuous professional learning and curriculum development (18). These findings demonstrate that research competencies are not limited to academic science but are integral across education, healthcare, management, and social development sectors.

The organizational dimensions of research competency development have been explored extensively in management and educational leadership research. Structural support from leadership, including research incentives, workload adjustments, access to funding, and institutional recognition, plays a decisive role in fostering research engagement among faculty (19). Motivational factors—such as self-efficacy, professional identity, and intrinsic interest—are equally critical, shaping individual willingness to pursue research opportunities and engage in scholarly activities. Studies show that faculty motivation decreases significantly in environments with limited resources, weak research culture, or insufficient managerial support (20).

Meanwhile, global perspectives on research competency development emphasize the importance of collaborative and boundary-spanning skills. Contemporary research environments increasingly require academics to work across disciplines, sectors, and national borders, necessitating competencies related to teamwork, communication, and reflexivity (2). This shift is reflected in collaborative research models in fields such as supply chain management, where collective problem-solving and interdisciplinary collaboration are essential for addressing complex global challenges (2).

Moreover, studies from Latin America and Europe highlight the need for formative research approaches that integrate practice-based inquiry into academic training (21). Emphasis on formative assessment, student-led research, and inquiry-based learning helps build foundational competencies that later translate into stronger faculty research performance. Such integrative models reinforce the view that research competency development is a lifelong process that spans undergraduate education through academic careers (6).

Recent scholarship also draws attention to creativity, innovation, and digital adaptability as emerging dimensions of research competency. The increasing role of AI-assisted tools, online data environments, and digital collaboration platforms requires faculty to develop competencies that extend beyond traditional research skills (22). These technological transformations underscore the importance of continuous professional development and the need for higher education institutions to integrate digital literacy into research training frameworks.

Despite the international emphasis on strengthening research competencies, there remains a significant gap in contextualized empirical studies addressing the unique challenges faced by faculty members in Iraq. Existing frameworks often fail to account for the interplay of organizational culture, motivational factors, structural barriers, and resource limitations that characterize Iraqi higher education (23). As Iraq's universities undergo modernization and capacity-building reforms, there is an urgent need for evidence-based models that identify influential factors and guide strategic development of research competencies among faculty (14). The absence of such localized frameworks limits the ability of educational leaders to design effective policies, allocate resources strategically, and cultivate sustainable research cultures.

Given the national importance of enhancing research capacity, understanding the determinants of research competency development among faculty in Iraqi universities is essential for shaping future academic policy, improving institutional performance, and contributing to global scientific advancement. Thus, the aim of this study is to identify and analyze the factors that influence the development of research competencies among faculty members in Iraqi universities.

Methods and Materials

The present study was designed with the aim of identifying the factors influencing the development of research competencies among faculty members in Iraqi universities. Given that the research topic required a comprehensive examination of the individual, organizational, and environmental dimensions of research competencies—as well as extracting the relationships among them—a mixed-methods exploratory sequential design was selected. In this approach, qualitative data were first collected and analyzed to identify key factors and related components, after which a questionnaire-based instrument was developed based on the qualitative findings to enable quantitative analysis and testing of relationships among variables.

In the qualitative phase, semi-structured interviews were conducted with 18 experts and university administrators using the systematic version of Grounded Theory proposed by Strauss and Corbin. Participants were selected through purposive and criterion sampling, such that all individuals held a doctoral degree and had at least five years of experience in teaching, research, and administration in Iraqi universities. The interviews began with open, key questions such as "In your opinion, what factors influence the development of research competencies?" and "What strategies are appropriate for developing research competencies?" and continued until theoretical saturation was reached.

Concurrent with the fieldwork, the documentary phase involved reviewing higher education policy documents in Iraq, including laws and regulations, strategic plans, research ethics charters, and university accreditation standards. This review helped identify the factors and components of research competency development not only from the perspectives of experts but also from the standpoint of official policies and reference documents. The validity and reliability of the qualitative data were ensured through several techniques: researcher reflexivity based on experience in teaching and research in Iraqi universities, member checking of findings, triangulation of evidence with documents and prior studies, peer debriefing by subject-matter experts, and assessment of intercoder reliability, which yielded a Holsti coefficient of 0.84 to ensure accuracy and stability of coding.

Following the extraction of qualitative factors, a questionnaire based on the qualitative findings was developed, and data were collected from 333 faculty members at Iraqi universities. Quantitative data were analyzed using structural equation modeling (SEM) to examine the effects of causal factors, contextual and intervening conditions on the development of research competencies, as well as the mediating role of educational and motivational strategies. This integration of qualitative and quantitative methods enabled the precise identification and ranking of influential factors and facilitated the development of a valid analytical model for enhancing research competencies.

Findings and Results

Analysis of the qualitative data revealed that the development of research competencies among faculty members is influenced by a set of multidimensional factors. The analysis process consisted of three stages: open coding, axial coding, and selective coding. In the open-coding stage, interview transcripts were reviewed line by line, and initial concepts were extracted. A total of 287 open codes were initially identified, which were later refined and reduced to 147 final open codes. Examples of these open codes included “interest in research,” “research self-efficacy,” “scientific attitude,” “organizational culture,” “methodological knowledge,” “analytical skills,” “organizational barriers,” “educational strategies,” and individual and organizational outcomes.

In the axial-coding stage, the open codes were grouped into 19 axial codes. Subsequently, in the selective-coding stage, six main categories emerged, representing the key dimensions of research competency development. These six categories included causal factors, core phenomenon, contextual conditions, intervening conditions, strategies, and outcomes. The highest frequency of codes belonged to the “core phenomenon” category with 42 codes (28.6%), highlighting the centrality of research competencies as the focal point of the study. This was followed by “causal factors” with 35 codes (23.8%) and “contextual conditions” with 24 codes (16.3%), indicating the importance of motivations, beliefs, and organizational and cultural environments in research competency development.

Details of the categories showed that:

• Causal factors included seven axial codes such as motivational factors, research self-efficacy, scientific attitude, organizational culture, and reward systems, with intrinsic motivation and interest in research constituting the largest share (22.9%).

• The core phenomenon included methodological knowledge, analytical skills, scientific writing skills, research ethics, critical thinking, and creativity and innovation, which were evenly distributed, indicating the simultaneous importance of multiple dimensions of research competence.

• Contextual conditions included organizational environment, resources and infrastructure, and cultural–social context, each of which contributed equally to competency development.

• Intervening conditions included individual, organizational, and environmental barriers, all of which played an equally inhibitory role.

• Strategies included educational, motivational, organizational, and communication strategies, each identified as equally important for competency development.

• Outcomes included individual, organizational, and social outcomes, demonstrating that developing research competencies leads to improved research performance, job satisfaction, and enhanced institutional standing for universities.

These findings clearly indicate that developing research competencies among faculty members is a multidimensional process that simultaneously requires attention to individual motivations and attitudes, the provision of appropriate scientific and cultural environments, the reduction of organizational and environmental barriers, and the implementation of diverse educational and motivational strategies.

In this study, qualitative data analysis was performed using the systematic Grounded Theory method of Strauss and Corbin, consisting of open coding, axial coding, and selective coding.

In the open-coding stage, the interview transcripts were reviewed line by line and paragraph by paragraph, and initial concepts were extracted. A total of 287 open codes were first identified, which after refinement were reduced to 147 final open codes. A sample of the open codes along with interviewee quotations is presented in the table below:

Table 1. Sample Open Codes and Interviewee Quotations

Open Code	Sample Quotation
Interest in research	"I am genuinely interested in conducting research, and this interest motivates me to continue even under difficult conditions." (Interviewee 5)
Research self-efficacy	"Belief in my own ability to conduct scientific research is the most important factor that motivates me." (Interviewee 3)
Scientific attitude	"A positive view toward research and valuing scientific production are the foundations of my research activities." (Interviewee 8)
Organizational culture	"In our university, there is a culture that encourages research, and this is highly motivating for me." (Interviewee 12)
Analytical skills	"The ability to analyze data and correctly interpret findings is the heart of a good research project." (Interviewee 10)

In the axial-coding stage, the 147 open codes were organized into 19 axial codes, and then in the selective-coding stage, they were categorized into six main categories. These categories include causal factors, core phenomenon, contextual conditions, intervening conditions, strategies, and outcomes. The frequency and percentage distribution of open codes for each category are shown in the table below:

Table 2. Frequency and Percentage of Open Codes for Each Category

Main Category	Frequency	Percentage
Causal factors	35	23.8%
Core phenomenon	42	28.6%
Contextual conditions	24	16.3%
Intervening conditions	18	12.2%
Strategies	16	10.9%
Outcomes	12	8.2%

Causal Factors: This category includes seven axial codes: motivational factors, research self-efficacy, scientific attitude, organizational culture, reward and incentive systems, managerial support, and professional requirements. The highest frequency belonged to motivational factors (22.9%), followed by scientific attitude (20.0%) and research self-efficacy (17.1%). These findings indicate that motivation and individual beliefs play a significant role in the development of research competencies.

Core Phenomenon: The core phenomenon consists of faculty members' research competencies, comprising seven axial codes: methodological knowledge, analytical skills, scientific writing skills, research ethics, critical thinking, creativity and innovation, and technological skills. The first six codes were evenly distributed at 16.7%, reflecting the equal importance of multiple dimensions of research competence.

Contextual Conditions: This category includes organizational environment, resources and infrastructure, and cultural–social context, with each code equally distributed at 33.3%. The findings highlight the influence of organizational environment, resource availability, and academic culture on the development of research competencies.

Intervening Conditions: This category comprises individual, organizational, and environmental barriers, each with an equal influence of 33.3% on the development of research competencies. This indicates the existence of challenges at all three levels.

Strategies: Strategies include educational, motivational, organizational, and communication strategies, with each distributed equally at 25%. These findings emphasize the importance of diversified strategies for developing research competencies.

Outcomes: Outcomes of developing research competencies include individual, organizational, and social outcomes, each distributed equally at 33.3%. These findings demonstrate that developing research competencies leads to increased personal satisfaction, enhanced quality of university research, and positive social impact.

Descriptive indices of the variables are presented in Table 3.

Table 3. Descriptive Indices of Variables

Influential Factors	Components	Mean	Interpretation
Causal factors	Motivational factors, research self-efficacy, scientific attitude, organizational culture, reward and incentive systems, managerial support, professional requirements	3.64–3.93	Indicates that motivational factors and professional requirements have the greatest impact on the development of research competence.
Contextual conditions	Organizational environment, resources and infrastructure, cultural–social context, scientific–educational environment	3.35–3.56	Indicates the importance of organizational, cultural, and scientific contexts in facilitating research.
Intervening conditions	Individual barriers, organizational barriers, environmental barriers	3.84–4.05	Barriers at individual, organizational, and environmental levels equally affect research activities.
Strategies	Educational, motivational, organizational, communication strategies	4.01–4.23	Diverse educational, motivational, organizational, and communication strategies contribute to developing research competencies.
Outcomes	Individual, organizational, social outcomes	3.96–4.12	Indicates positive outcomes of developing research competence at individual, organizational, and social levels.

Descriptive analysis of the quantitative data shows that the mean values for all model variables are above average, with strategies and individual outcomes having the highest means. These findings confirm that causal factors, contextual and intervening conditions, strategies, and outcomes play significant roles in the development of research competencies among faculty members.

To assess the normality of the data distribution, the Kolmogorov–Smirnov test and skewness–kurtosis indices were used. Table 4 presents the Kolmogorov–Smirnov test results for the main variables of the study.

Table 4. Kolmogorov–Smirnov Test Results for Assessing Data Normality

Variable	Statistic	Degrees of Freedom	Significance Level
Causal factors	0.052	333	0.200
Contextual conditions	0.048	333	0.200
Intervening conditions	0.057	333	0.089
Strategies	0.061	333	0.063
Outcomes	0.059	333	0.071
Research competencies	0.050	333	0.200

As shown in Table 4, the significance level of the Kolmogorov–Smirnov test for all variables is greater than 0.05, which indicates that the data distribution is normal. Furthermore, according to Tables 4–4 to 4–10, the skewness and kurtosis values of all variables fall within the range of (-2, 2), which further confirms the normality of the data distribution.

To examine multicollinearity among the independent variables, the variance inflation factor (VIF) and tolerance indices were used. Table 5 presents these indices for the independent variables of the study.

Table 5. Multicollinearity Indices for the Independent Variables

Variable	Tolerance	VIF
Causal factors	0.583	1.715
Contextual conditions	0.612	1.634
Intervening conditions	0.647	1.546
Strategies	0.571	1.751

As shown in Table 5, the VIF values for all variables are less than 10 and the tolerance values are greater than 0.10, which indicates the absence of multicollinearity among the independent variables.

In order to rank the components of each of the main variables of the study, the Friedman test was used. This test is applied to compare the mean ranks of several related groups. In the following, the results of the Friedman test for each of the main variables of the study are presented.

Table 6 presents the results of the Friedman test for ranking the components of causal factors.

Table 6. Results of the Friedman Test for Ranking the Components of Causal Factors

Component	Mean Rank	Rank
Professional requirements	5.18	1
Motivational factors	4.92	2
Research self-efficacy	4.57	3
Reward and incentive system	4.12	4
Scientific attitude	3.89	5
Managerial support	3.65	6
Organizational culture	3.47	7
Chi-square statistic	127.34	
Degrees of freedom	6	
Significance level	0.001	

As shown in Table 6, the results of the Friedman test for ranking the components of causal factors are significant ($p < 0.001$). Accordingly, the component “professional requirements” with a mean rank of 5.18 is ranked first, the component “motivational factors” with a mean rank of 4.92 is ranked second, and the component “research self-efficacy” with a mean rank of 4.57 is ranked third. Also, the component “organizational culture” with a mean rank of 3.47 is ranked last.

Table 7 presents the results of the Friedman test for ranking the components of research competencies.

Table 7. Results of the Friedman Test for Ranking the Components of Research Competencies

Component	Mean Rank	Rank
Research ethics	4.86	1
Methodological knowledge	4.53	2
Critical thinking	4.21	3
Scientific writing skills	3.89	4
Analytical skills	3.74	5
Technological skills	3.58	6
Creativity and innovation	3.19	7
Chi-square statistic	142.67	
Degrees of freedom	6	
Significance level	0.001	

As shown in Table 7, the results of the Friedman test for ranking the components of research competencies are significant ($p < 0.001$). Accordingly, the component “research ethics” with a mean rank of 4.86 is ranked first, the component “methodological knowledge” with a mean rank of 4.53 is ranked second, and the component “critical thinking” with a mean rank of 4.21 is ranked third. Also, the component “creativity and innovation” with a mean rank of 3.19 is ranked last.

Table 8 presents the results of the Friedman test for ranking the components of contextual conditions.

Table 8. Results of the Friedman Test for Ranking the Components of Contextual Conditions

Component	Mean Rank	Rank
Scientific–educational environment	2.87	1
Cultural–social context	2.63	2
Organizational environment	2.32	3
Resources and infrastructure	2.18	4
Chi-square statistic	83.45	
Degrees of freedom	3	
Significance level	0.001	

As shown in Table 8, the results of the Friedman test for ranking the components of contextual conditions are significant ($p < 0.001$). Accordingly, the component "scientific–educational environment" with a mean rank of 2.87 is ranked first, the component "cultural–social context" with a mean rank of 2.63 is ranked second, the component "organizational environment" with a mean rank of 2.32 is ranked third, and the component "resources and infrastructure" with a mean rank of 2.18 is ranked last.

Table 9 presents the results of the Friedman test for ranking the components of intervening conditions.

Table 9. Results of the Friedman Test for Ranking the Components of Intervening Conditions

Component	Mean Rank	Rank
Organizational barriers	2.26	1
Environmental barriers	1.97	2
Individual barriers	1.77	3
Chi-square statistic	56.83	
Degrees of freedom	2	
Significance level	0.001	

As shown in Table 9, the results of the Friedman test for ranking the components of intervening conditions are significant ($p < 0.001$). Accordingly, the component "organizational barriers" with a mean rank of 2.26 is ranked first, the component "environmental barriers" with a mean rank of 1.97 is ranked second, and the component "individual barriers" with a mean rank of 1.77 is ranked last.

Table 10 presents the results of the Friedman test for ranking the components of strategies.

Table 10. Results of the Friedman Test for Ranking the Components of Strategies

Component	Mean Rank	Rank
Educational strategies	2.92	1
Motivational strategies	2.75	2
Communication strategies	2.32	3
Organizational strategies	2.01	4
Chi-square statistic	79.24	
Degrees of freedom	3	
Significance level	0.001	

As shown in Table 10, the results of the Friedman test for ranking the components of strategies are significant ($p < 0.001$). Accordingly, the component "educational strategies" with a mean rank of 2.92 is ranked first, the component "motivational strategies" with a mean rank of 2.75 is ranked second, the component "communication strategies" with a mean rank of 2.32 is ranked third, and the component "organizational strategies" with a mean rank of 2.01 is ranked last.

Table 11 presents the results of the Friedman test for ranking the components of outcomes.

Table 11. Results of the Friedman Test for Ranking the Components of Outcomes

Component	Mean Rank	Rank
Individual outcomes	2.18	1
Organizational outcomes	2.05	2
Social outcomes	1.77	3
Chi-square statistic	48.72	
Degrees of freedom	2	
Significance level	0.001	

As shown in Table 11, the results of the Friedman test for ranking the components of outcomes are significant ($p < 0.001$). Accordingly, the component "individual outcomes" with a mean rank of 2.18 is ranked first, the component "organizational outcomes" with a mean rank of 2.05 is ranked second, and the component "social outcomes" with a mean rank of 1.77 is ranked last.

The results of the Friedman test indicate that among the components of causal factors, "professional requirements" and "motivational factors" are of greater importance. Among the components of research competencies, "research ethics" and "methodological knowledge" are of greater importance. Among the components of contextual conditions, the "scientific–educational environment" is of greater importance. Among the components of intervening conditions, "organizational barriers"

are of greater importance. Among the components of strategies, “educational strategies” and “motivational strategies” are of greater importance. Finally, among the components of outcomes, “individual outcomes” are of greater importance.

Discussion and Conclusion

The purpose of this study was to identify and analyze the factors influencing the development of research competencies among faculty members in Iraqi universities, and the findings provide significant insight into the multidimensional nature of research competency formation. The results demonstrated that causal factors—including motivational drivers, research self-efficacy, scientific attitudes, organizational culture, reward systems, managerial support, and professional requirements—play foundational roles in shaping the research behavior of faculty members. The prioritization of professional requirements and motivational factors is consistent with broader international research, which emphasizes that intrinsic motivation and professional expectations serve as primary catalysts for academic engagement and research productivity (1). Studies examining research engagement among faculty members have repeatedly demonstrated that institutional expectations regarding research performance are closely linked to faculty motivation, perceived competence, and academic identity (20). The centrality of scientific attitude and self-efficacy found in this study aligns with previous research showing that researchers with higher levels of confidence and positive attitudes toward scientific inquiry demonstrate greater persistence and higher-quality research outcomes (8).

Moreover, the study revealed that research ethics and methodological knowledge are the highest-ranked components of research competencies. This result reinforces the claim that ethical literacy and methodological rigor form the backbone of responsible and impactful scholarly work (16). Previous systematic reviews demonstrate that the ethical dimension of research has gained increasing significance in recent years, particularly with the integration of digital tools, online datasets, and artificial intelligence, which require more sophisticated ethical awareness and methodological precision (15). The finding is also consistent with evidence showing that students, novice researchers, and faculty across diverse academic fields perceive methodological knowledge as the most demanding yet indispensable competency for scholarly advancement (3). Likewise, international studies confirm that the strengthening of methodological and ethical competencies enhances the quality of academic writing, increases publication success, and strengthens global research collaboration (2).

The present study also found that the scientific–educational environment is the most influential contextual condition. This highlights the essential role that institutional infrastructure, research culture, and academic climate play in shaping research performance. Numerous studies affirm that favorable academic environments—including access to laboratories, digital resources, funding, workshops, and supportive leadership—correlate strongly with improved research competencies and scholarly productivity (9). Research from Middle Eastern and developing contexts similarly stresses that inadequate institutional support and unstable research infrastructures limit both faculty engagement and the long-term sustainability of research initiatives (10). Comparatively, environments that invest in capacity-building programs, research mentorship, and collaborative learning opportunities facilitate the development of research competencies not only among students but also among early-career and senior faculty members (6). Thus, the results of this study reflect a global pattern: institutions that prioritize research infrastructure and academic culture tend to produce more competent and motivated researchers.

Another important finding concerns the intervening conditions—individual, organizational, and environmental barriers—that affect research competency development. This study identified organizational barriers as the most influential, surpassing environmental and individual barriers. These results align with earlier evidence showing that bureaucratic constraints, excessive administrative duties, unclear policies, and insufficient managerial support constitute major obstacles to faculty research engagement (11). Furthermore, research from various international settings indicates that organizational-level challenges, such

as limited autonomy, restricted access to funding, and inadequate reward systems, often exert stronger effects on research productivity than individual motivation or environmental limitations (23). In the Iraqi context, this issue is particularly salient due to the complex administrative structures and transitional state of higher education management (19). The dominance of organizational barriers revealed here reflects deeper structural challenges and calls for systemic reforms within Iraqi universities to improve research governance, reduce administrative burdens, and enhance managerial support.

Regarding strategies, this study found that educational and motivational strategies are the most effective in enhancing research competencies. The prioritization of educational strategies, including training workshops, mentorship programs, and systematic methodological instruction, strongly aligns with international findings emphasizing the transformative role of structured learning in research capacity building (4). Educational interventions that strengthen analytical thinking, methodological literacy, and academic writing have been shown to significantly improve research engagement and scholarly confidence among students and faculty alike (14). Similarly, motivational strategies—including recognition, incentives, and supportive feedback—are widely recognized as powerful mechanisms for encouraging faculty to participate more actively in research (5). Professional motivation is also strengthened when researchers perceive research engagement as aligned with their career goals, identity, and institutional values (7). The strong ranking of motivational strategies in this study reinforces the conclusion that research competency development requires not only technical training but also psychological reinforcement and institutional appreciation.

In terms of outcomes, individual outcomes such as improved confidence, increased motivation, enhanced research performance, and strengthened capacity to supervise students received the highest ranking. This aligns with global literature demonstrating that enhanced research competencies lead to greater self-efficacy, improved academic identity, and better scholarly output (12). Similar studies indicate that when faculty acquire the necessary research competencies, they are more likely to publish, collaborate internationally, engage in interdisciplinary projects, and mentor students effectively (13). Organizational outcomes, including improved institutional reputation and academic quality, were also identified as significant but secondary outcomes. This corroborates findings from research emphasizing that strong faculty research competencies contribute directly to institutional accreditation, international rankings, and the advancement of national research agendas (21). Social outcomes, though ranked lowest, remain essential for strengthening national knowledge production, informing public policy, and contributing to economic and societal development (17).

The integration of all findings reveals a coherent framework in which individual factors, organizational structures, institutional environments, and strategic interventions interact dynamically to shape research competency development. The prominence of ethical competence, methodological skills, and motivational drivers underscores the need for holistic approaches that combine training, institutional reform, and cultural change. These results resonate with the argument that research competency development must be approached as a multi-layered and systemic endeavor rather than an isolated academic responsibility (2). The emergence of AI-assisted research tools also reinforces the need for methodological and ethical competence, as faculty must navigate new digital norms, maintain academic integrity, and ensure responsible use of AI in research processes (22). This further strengthens the case for continuous professional development programs within Iraqi universities.

Overall, the results of this study align with a substantial body of international evidence demonstrating that research competency development is influenced by a combination of psychological, organizational, and contextual factors. The findings highlight critical areas for intervention, especially in the realms of institutional support, research training, motivational reinforcement, and infrastructural improvement. These insights contribute to the broader understanding of how research

competencies can be strategically developed in higher education systems, particularly those operating within transitional environments such as Iraq.

This study was conducted within a specific national context and may not fully reflect variations across universities with different governance structures or resource levels. Data collection relied on self-report instruments that may be subject to bias, and although the sample size was substantial, qualitative insights depended on the perspectives of a limited group of experts. The cross-sectional design restricts the ability to examine changes in competencies over time or identify causal relationships.

Future studies should adopt longitudinal methodologies to capture the development of research competencies across academic career stages. Comparative studies between Iraqi universities and international institutions could provide deeper insight into contextual influences. Further research might also explore how digital technologies, including AI-based research tools, shape competency development and how organizational reforms can be tailored to different institutional settings.

Universities should prioritize structured research training, mentorship programs, and professional development workshops to strengthen methodological and ethical competencies. Institutional leaders must reduce administrative workload, enhance resource allocation, and provide incentives that reinforce research engagement. Creating a supportive research culture, improving infrastructure, and integrating motivational strategies will significantly enhance faculty research capacity and overall academic quality within Iraqi universities.

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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 adhered 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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