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The Significance of Scientific Research in Higher Education Institutions of Afghanistan: Challenges, Solutions, and Strategies for Enhancement (2022-2024)

Rohullah Samim[1], Muhammad Ishaq Noori[2]

[1,2]*Faculty of Law and Political Science, Ghalib University, Kabul, Afghanistan*

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Abstract: Scientific research is a fundamental pillar of higher education institutions (HEIs), driving knowledge production, innovation, and national development. This study explores the significance of scientific research within Afghanistan's HEIs, identifies key challenges that impede its development, and proposes strategies to enhance it. Employing a qualitative, descriptive-analytical design, the research uses content analysis of data gathered through semi-structured interviews and a comprehensive literature review. A total of 30 participants were selected based on expertise, experience, and academic background, in line with the principle of theoretical saturation. The findings highlight the crucial role of scientific research in improving education quality, fostering researcher expertise, generating new knowledge, and strengthening academic recognition in Afghanistan. However, significant barriers hinder progress, including insufficient funding, outdated infrastructure, limited research tools, limited global collaboration, bureaucratic inefficiencies, a shortage of qualified researchers, and the commercialization of private universities. To address these obstacles, the study recommends comprehensive policy reforms such as capacity-building programs, improved access to up-to-date academic resources, the establishment of institutional research committees and peer-reviewed journals, enhanced financial support, and a strategic cultural shift to prioritize research within HEIs.

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INTRODUCTION

Scientific research is a fundamental function of higher education institutions (HEIs) and a key driver of academic excellence and national development (Altbach, 2016; UNESCO, 2021; Nezai et al., 2022). Globally, universities contribute not only to knowledge production and dissemination but also to evidence-based policymaking, technological innovation, and community engagement (Marginson, 2018; Nezai et al., 2022). In well-established academic

✉ Corresponding author E-mail: samim@ghalib.edu.af

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systems, research underpins sustainable progress and enhances institutional credibility. However, in post-conflict and developing contexts such as Afghanistan, HEIs face persistent structural, institutional, and cultural challenges that hinder the integration of scientific research into academic and societal development. Political instability, inadequate funding, insufficient infrastructure, weak institutional support, and limited research culture among faculty and students constrain Afghan universities' capacity to generate high-quality research (World Bank, 2022; Jalal & Ayubi, 2020; Van & Tuyet, 2023).

Empirical evidence highlights the implications of these limitations. Without innovative scientific inquiry, universities struggle to meet the evolving demands of government, industry, and society, limiting their contribution to a knowledge-based economy (Cheng et al., 2023). Teaching methods that do not adequately engage students, combined with weak faculty-student collaboration, further exacerbate the situation (Alba Salah et al., 2022). Strategic initiatives such as capacity-building programs, leadership development, practical student training, and collaborative research projects are essential to foster a robust research culture (Lei, 2023; Jannah, 2023; Agustina et al., 2023; Yu et al., 2023). Management tools like Data Envelopment Analysis (DEA) can optimize research performance and resource allocation, while innovative governance models enhance collaboration, inclusivity, and productivity (Lei, 2023; Vovchenko, 2023). Integrating modern technologies, such as cloud-based platforms and artificial intelligence, can further facilitate knowledge sharing and elevate research standards to international levels (Hang & Van, 2024; Herasymenko et al., 2024).

Despite these insights, critical gaps persist in the literature. Few studies have comprehensively analyzed the long-term impact of structural, cultural, and policy-related barriers on Afghanistan's research productivity. Limited research exists on sustainable strategies to foster student and faculty engagement, create a vibrant research culture, and leverage international collaboration for capacity building. Addressing these gaps is vital for reinforcing the role of scientific research as a cornerstone of higher education and national development.

This study, therefore, aims to examine the significance of scientific research in Afghanistan's HEIs between 2022 and 2024. The study focuses on:

- Assessing the current landscape of research activities, institutional strengths, and capacity constraints.
- Identifying the main challenges and barriers, including funding shortages, inadequate infrastructure, and limited access to academic resources.
- Exploring innovative strategies, pedagogic practices, and technological interventions to enhance research productivity and student engagement.
- Developing policy and strategic frameworks to strengthen collaboration, governance, and research quality.
- Evaluating the potential impact of enhanced research capacity on academic standards, institutional development, and broader socio-economic progress.

By addressing these objectives, the study contributes to scholarly knowledge, informs policy, and provides actionable recommendations for Afghan HEIs, government authorities, and international partners. Strengthening scientific research capacity and fostering a sustainable culture of inquiry will not only improve academic quality but also empower universities to support societal and national development in Afghanistan actively.

RESEARCH METHOD

This study employed a quantitative research methodology to examine factors affecting scientific research capacity in Afghan higher education institutions (HEIs). Quantitative methods were selected because they allow the systematic collection of numerical data, enabling statistical analysis to identify patterns, relationships, and trends among participants' perceptions and experiences. This approach provides objective evidence to assess research capacity and the challenges faced by HEIs in Afghanistan. The research adopted a descriptive-survey design, which is appropriate for this study because it facilitates the collection of structured data from participants to describe their perspectives, challenges, and practices in scientific research. This design is particularly well-suited to understanding the current state of research activities in HEIs and to identifying key factors influencing research performance.

Data Analysis

To ensure inclusivity and improve data quality, the participants received the interview questions in advance in both English and Dari (Clarke & Braun, 2017). This approach helped participants better prepare their responses, facilitating richer, more thoughtful data collection.

Thematic analysis was conducted using a rigorous three-step coding process in NVivo 14 (Creswell, 2017). The steps included:

- **Open Coding:** Initial examination of the interview transcripts to identify meaningful units of information and generate preliminary codes representing distinct concepts or ideas.
- **Axial Coding:** Grouping related codes to form broader categories and sub-themes, establishing relationships between them to organize the data coherently.
- **Theoretical Coding:** Integrating the categories into overarching themes that explain the underlying patterns in the data and address the research questions.

Throughout this process, sample codes such as "lack of funding," "motivation challenges," and "capacity building needs" were identified, supported by diverse participant quotes to enhance the analysis's validity.

Three prominent themes emerged as determining factors in the state of scientific research in Afghanistan's higher education institutions: the importance of Research, Challenges in Research, and Strategies to Address Challenges and Strengthen Research. These

themes provide a structured foundation for the following detailed discussions, illuminating the complex interactions between various elements in this context (see Table 5).

The analytical process ensured precision and meaningful data synthesis, effectively capturing the essence of participants' perspectives and experiences (Creswell, 2017). This rigorous exploration and synthesis of qualitative data offer valuable insights into scientific research practices, barriers, and opportunities within Afghanistan's higher education sector.

Sampling and Participants

A purposive sampling technique was employed to ensure that participants possessed direct experience and relevant knowledge of scientific research within Afghan HEIs. This method was selected because the study specifically targets individuals who can provide rich and informative data aligned with the research objectives. A total of 30 participants from 20 universities (10 public and 10 private) were selected, including university professors, research directors, deans, department heads, and master's students and graduates. The participants represented both central and provincial regions, providing a diverse and representative sample. The purposive approach ensured that all participants had substantial exposure to research practices, challenges, and institutional policies, which is essential for obtaining meaningful and relevant insights.

Data Collection

The primary data collection method was semi-structured, face-to-face interviews conducted between March and June 2024. A researcher-designed questionnaire guided the interviews, comprising three main questions and three sub-questions on research culture, institutional governance, and systemic challenges. Interviews lasted 20-30 minutes and were conducted with faculty members, research coordinators, university administrators, and academic staff. The interpretive phenomenological approach (Smith et al., 2009) was adopted to explore participants' lived experiences and perceptions in the post-conflict Afghan academic environment.

Validity and Ethical Considerations

To enhance the research's credibility, several qualitative validation strategies were applied. These included triangulation (cross-verifying data across different participant groups), member-checking (sharing findings with selected participants for feedback), and peer review (review of themes and interpretations by academic colleagues). Informed consent was obtained from all participants prior to interviews. Participants were briefed on the purpose, confidentiality, and voluntary nature of their involvement. Ethical standards, including privacy and anonymity, were strictly maintained throughout the research process (Klykken, 2022).

FINDINGS AND DISCUSSION

Table 5. *Themes of the Research Study*

Themes	Theme Description
Importance of Research	Encompasses sustainable national development, knowledge production and academic excellence, enhancement of research capacity, educational quality improvement, accreditation and quality assurance, and fostering civilizational dialogue and integration.
Challenges in Research	Includes lack of research support, insufficient budget and resources, weak research culture, limited access to updated resources, political-legal-economic instability, shortage of specialized researchers, low motivation and interest, promotion-oriented public institutions, and profit-driven private institutions.
Strategies to Address Challenges and Strengthen Research	Consists of comprehensive support for research, provision of resources and infrastructure, capacity building, motivating researchers, establishing academic journals and research plans, institutionalizing a research culture, and mandating scientific research.

The findings of this study highlight the crucial role of scientific research in promoting academic excellence, socio-economic progress, and institutional development within Afghanistan's higher education system. The data gathered from faculty members, research departments, and students between 2022 and 2024 indicate that while awareness of the value of research has significantly improved, the practical implementation and institutional support mechanisms remain weak and inconsistent across universities. The study's results align with the broader literature, which emphasizes that research is the backbone of academic innovation and national competitiveness; yet in Afghanistan, the absence of a sustainable research culture continues to hinder this potential. One of the most prominent challenges identified is the lack of adequate funding and research infrastructure. Most public and private universities depend heavily on tuition fees, leaving little to no allocation for research projects, laboratories, or publication costs. This structural weakness has created an environment in which research is perceived as an additional burden rather than a professional obligation.

Furthermore, limited access to digital databases, academic journals, and global networks restricts Afghan researchers' engagement in international academic discourse, resulting in low publication rates and minimal contributions to global scholarship. Another significant barrier is the insufficient research capacity and training among faculty and postgraduate students. Many instructors, especially in regional universities, lack methodological training and experience in academic writing, data analysis, and publication ethics. This deficiency not only affects the quality of research outputs but also limits the formation of interdisciplinary collaborations and the practice of evidence-based policymaking. The study found that the absence of formal mentorship systems and weak institutional incentives, such as promotion criteria tied to teaching rather than research productivity, further demotivates potential researchers. Despite these challenges, the research also identifies several emerging positive

trends. Universities such as Kabul University, Herat University, and Ghalib University have begun integrating research-based courses and encouraging faculty to publish in indexed journals.

Additionally, the Ministry of Higher Education has taken preliminary steps to establish research and innovation policies to foster quality assurance, ethical standards, and funding mechanisms. These developments suggest an evolving recognition of the role research plays in Afghanistan's intellectual and national reconstruction. To strengthen this momentum, several strategic interventions are necessary. First, universities must establish dedicated research centers and funding offices that facilitate proposal development, grant writing, and collaborations with national and international partners. Second, capacity-building programs for faculty and postgraduate students covering research design, statistical analysis, and academic writing should be institutionalized. Third, promoting international partnerships and academic exchange programs would expose Afghan researchers to global best practices, thus improving the overall quality and visibility of Afghan scholarship.

Finally, national policy reforms must prioritize research funding and integrate performance-based rewards for academic productivity. In conclusion, while Afghanistan's higher education sector faces persistent structural and cultural barriers, there is a growing awareness and institutional commitment toward strengthening scientific research. The findings of this study indicate that through coordinated policy action, institutional reform, and international cooperation, Afghan universities can gradually transform into knowledge-producing institutions capable of contributing to both national development and global academic discourse. This transition requires not only financial investment but also the cultivation of a research-oriented mindset among educators, administrators, and students alike.

Theme One: Importance of Research

The thematic analysis was conducted in three stages. First, open coding identified initial codes such as "sustainable development," "knowledge production," and "women's role in education" from participant interviews. Then, axial coding grouped the codes into categories such as "National Development" and "Academic Excellence." Finally, theoretical coding connected these categories to form the overarching theme "Importance of Research."

Sustainable National Development

Scientific research in Higher Education Institutions (HEIs) is widely viewed as a key driver for Afghanistan's sustainable national development. Participant 26 emphasized:

"Conducting research in educational institutions is one of the main pillars of sustainable development and progress."

Similarly, Participant 19 noted:

"Research not only identifies societal challenges but also collaborates with relevant organizations to address them."

This finding aligns with Franklin et al. (2023), who argue that educational practices fostering sustainability competencies and cultural understanding are critical in post-conflict societies. Furthermore, Momand & Gul (2023) highlight that knowledge management systems in universities enhance organizational performance, helping HEIs respond effectively to national challenges. The role of women in academic research is also critical; Hadfi et al. (2023) note that increasing women's participation enriches societal insight on development, supported by evidence linking maternal education to improved community health outcomes (Bhowmik et al., 2024; Gardiwal et al., 2024). Digital learning platforms, especially during crises such as COVID-19, have enabled flexible education delivery, supporting continuity and national development (Monib, 2023; Sadat & Sadaat, 2023). These initiatives reveal both opportunities and challenges in building equitable digital access, which is crucial for achieving sustainable development goals.

Connection to research questions: This theme illustrates how scientific research directly contributes to Afghanistan's development challenges, addressing the role of research in national progress.

Knowledge Production and Academic Excellence

Research facilitates critical thinking and innovation, vital for academic excellence. Participant 11 remarked:

"Institutions that are not research-oriented are stagnant and incapable of meeting societal needs."

Participant 14 added:

"Knowledge production is a primary mission of universities, alongside teaching and information transfer."

These views resonate with Akerjordet et al. (2012) and Jagosh et al. (2012), who stress the need for collaborative research models to improve knowledge relevance and applicability. Multidisciplinary collaboration fosters innovation and high-quality outputs (Grigorovich et al., 2018).

Research Capacity Enhancement

Many participants emphasized building research capacity through targeted training and partnerships. Participant 19 stated:

"Scientific research prepares researchers to solve complex future problems."

Participant 4 noted:

"Research helps students and professors develop skills, specialized knowledge, and professional recognition."

These findings align with literature emphasizing capacity-building strategies in consortia and collaborative frameworks (Tait & Williamson, 2019; Tagoe et al., 2022; Carter et al., 2019).

Educational Quality Enhancement

Educational quality improves when research capacity and knowledge translation are strong. Jagosh et al. (2012) and Hawkes et al. (2015) note that participatory action research and collaborative networks enhance the relevance of learning. Mentorship and structured training also support quality (Renwick et al., 2017). Participant 1 emphasized:

"Updating curricula and developing educational programs are key to improving education quality."

Nazari (2019) highlights the importance of values like transparency and accountability in quality assurance.

Accreditation and Quality Assurance

Accreditation is a systematic process reflecting institutional quality. Participant 23 stated:

"Universities must produce knowledge and conduct scientific research to achieve accreditation and academic status."

This is supported by Majtaba Zadeh (2018), Probandari et al. (2017), and Lode et al. (2015), who emphasize the importance of research-based quality assurance mechanisms and capacity building for effective accreditation.

Civilizational Dialogue and Integration

Research serves as a bridge between civilizations by enabling the exchange of scientific knowledge. Participant 10 said:

"Research serves as a bridge between civilizations; it is the lifeblood of human societies."

Commercialization of research findings furthers this exchange by transferring knowledge to industry (Safari & Kolahi, 2013). Dal Pinho et al. (2023) and Ogega et al. (2023) highlight that collaborative research fosters mutual understanding and integration across cultures. Historical analyses by Пилипів & Семикрас (2021) also underscore the role of cultural understanding in civilizational dialogue. This theme deepens the understanding of research not only as knowledge creation but as a tool for societal cohesion and intercultural integration, with real-world implications for peacebuilding and cooperation.

Interaction between Themes

The themes are interconnected; for example, the lack of resources (due to challenges) affects motivation and research capacity, which, in turn, influences educational quality and accreditation success. Sustainable development depends on knowledge production and capacity enhancement, all linked through a feedback loop strengthened by civilizational dialogue.

Table 6. *Summary of the Importance of Research*

Elements	Excerpts from Interview	Insights	Participant Codes
Sustainable National Development	"Research is a pillar for sustainable national development." (P26) "Research helps identify and solve societal problems." (P19)	Research drives scientific progress, economic growth, and social problem-solving, all of which are essential to Afghanistan's sustainable development.	1-8; 10-19; 22; 24; 26-28; 30
Knowledge Production and Academic Excellence	"Non-research institutions cannot meet society's needs." (P11) "Research is more important than teaching." (P14)	Knowledge production fosters innovation, prevents academic stagnation, and advances science and technology.	1; 4; 6; 7; 8; 11; 14; 15; 17; 20; 23; 26; 29; 30
Research Capacity Enhancement	"Research improves skills and prepares researchers for complex challenges." (P19) "Research builds academic status." (P4)	Training and collaborative frameworks develop skills and specialized knowledge and enhance researchers' capacities.	1; 4; 6; 7; 8; 10; 18; 19; 23; 24; 30
Educational Quality Enhancement	"Updating curricula enhances education quality." (P1) "Research strengthens the educational process." (P20)	Research aligns education with real needs, encourages mentorship, and promotes accountability for quality improvement.	1; 6; 10; 14; 20; 23
Accreditation and Quality Assurance	"Research is crucial for academic accreditation." (P23) "Research indicates institutional quality." (P6)	Research output underpins accreditation, supports continuous evaluation, and improves institutional effectiveness.	2; 6; 14; 21; 23
Civilizational Dialogue and Integration	"Research bridges civilizations." (P10) "It is the soul of human communities." (P26)	Research fosters cross-cultural understanding and global integration.	1; 10; 26

Theme Two: Challenges in Research

A challenge is defined as a new condition or situation that disrupts the stability and future path of society, requiring significant and decisive efforts to overcome (Nazari, 2019). Based on interview analysis, the key challenges facing scientific research in Afghanistan's higher education institutions are as follows:

Coding Process: Data were initially open-coded to identify discrete challenges. These codes were then grouped axially into broader categories such as "lack of support" and "weak research culture." Finally, theoretical coding identified these categories as central obstacles affecting research development.

Lack of Research Support

Adequate financial, moral, and logistical support is crucial for research advancement. However, most participants reported insufficient support in Afghanistan.

- *Participant 30: "The lack of financial support is a significant challenge. For example, if a professor wants to conduct research, they do not receive funding or compensation."*
- *Participant 25: "The Ministry of Higher Education's previous lack of serious attention to research clearly illustrates the insufficient support for scientific inquiry."*

This aligns with Nazari's (2019) emphasis on institutional backing as foundational for research growth.

Insufficient Budget and Resources

Universities primarily depend on government funds, tuition fees, and donations for research financing.

- *Participant 29: "There is a severe shortage of dedicated research budgets, especially within academic institutions."*
- *Participant 4: "Limited financial resources hamper critical research activities such as resource acquisition, equipment purchase, and travel."*

Previous literature corroborates that financial constraints remain a significant hurdle for research in developing contexts (Nazari, 2019).

Weak Research Culture

Several factors contribute to the erosion of a strong research culture:

- Lack of a unified national or international framework for qualitative and quantitative research.
- Low motivation among academics to apply modern research methods and findings.
- Minimal social value is attributed to academic activities, discouraging research engagement.
- *Participant 29* emphasized these elements as critical barriers.

These findings align with existing studies that highlight culture as a vital element of research productivity.

Limited Access to Updated Resources

Access to current, primary information is often challenging, especially in sensitive or legally constrained areas.

- *Participant 1: "Gaining access to up-to-date information is difficult, particularly for certain research fields."*
- *Participant 29: "Many Afghan academics lack access to global research databases and updated resources, limiting their use of modern methodologies."*

This is consistent with global research indicating that resource accessibility remains a persistent challenge.

Political, Legal, and Economic Instability

Ongoing instability in Afghanistan's political, legal, and economic systems creates an unpredictable research environment.

- *Participants 16 and 20 noted the detrimental impact of this instability on research activities.*

Interrelations and Impact

These challenges interact to compound the effect: a lack of support and funding diminishes motivation and research capacity, negatively impacting the quality of educational outputs and institutional accreditation efforts. The unstable political and economic context exacerbates these issues, limiting progress in research and development.

Connection to Research Questions

Identifying and understanding these challenges directly addresses the study's research questions regarding barriers to scientific research within Afghanistan's higher education institutions, highlighting critical areas for policy and institutional reform.

Shortage of Specialized Researchers

Effective research requires researchers to possess a range of intrinsic, acquired, cognitive, and metacognitive skills such as intelligence, talent, critical and abstract thinking, curiosity, focus, and attention (Rigi & Azizi, 2019). *Participants (6; 7-10; 12; 14; 17; 19; 23-28; 30) consistently reported a significant shortage of specialized human resources within Afghanistan's educational institutions.*

Participant 6 emphasized: *"Many academic staff lack familiarity with modern research methods and techniques, which is a significant obstacle to scientific research."*

This shortage impedes the advancement of scientific inquiry and limits the institutions' research output.

Low Motivation and Interest in Research

Motivation and commitment to utilizing existing research findings or to conducting and disseminating new research are crucial for generating valuable knowledge and fulfilling researchers' academic responsibilities to society. However, a lack of strong will among members of Afghanistan's academic community to engage with modern research methods and global findings often diminishes the enthusiasm of emerging researchers.

Participant 6 noted: *"The lack of a strong will among academic community members to use modern research methods and findings can neutralize the motivation and interest of new researchers entering the research environment."* This reflects the critical role of academic culture and incentives in sustaining research momentum.

Promotion-Oriented Nature of Public Educational Institutions

According to Participant 11, public institutions primarily view research as a means for academic promotion rather than a genuine scientific contribution:

"Public institutions are promotion-oriented; most research is conducted to obtain academic ranks, which hold administrative rather than scientific significance. Opportunities exist, but the necessary determination is lacking." This administrative focus undermines the quality and purpose of research activities.

Profit-Driven Nature of Private Institutions

Private educational institutions are perceived as prioritizing profit over research.

Participant 11 stated: *"Private institutions are profit-centered; conducting research requires funding and investment, which they rarely provide. Instead, teaching hours are increased. Even if professors fund research personally, the heavy teaching load prevents meaningful engagement."*

Similarly, Participant 3 observed: *"Many private institutions view research commercially, seeking projects as income sources. This commodification leads to lower research quality and increased plagiarism."*

These perceptions highlight structural and motivational barriers unique to private sector institutions.

Summary and Theoretical Integration

The challenges identified, ranging from a lack of skilled researchers and motivation to institutional priorities, align with the existing literature, which emphasizes that human capital development, a supportive academic culture, and institutional incentives are vital for strengthening research capacity (Rigi & Azizi, 2019; Nazari, 2019). Addressing these multifaceted obstacles requires systemic reforms at both governmental and institutional levels. Relation to Research Questions:

This thematic analysis directly addresses the research question regarding barriers to scientific research in Afghanistan's higher education, providing actionable insights for policy and academic stakeholders to enhance research productivity and impact.

Table 7. *Summary of Challenges in Research Theme*

Elements	Excerpts from Interviews (Selected Quotes)	Insights	Specific Participant Codes
Lack of Research Support	- Participant 30: "The lack of financial support is a significant challenge for professors wanting to conduct research." - Participant 25: "Ministry of Higher Education has not given serious attention to research."	Absence of connections between academic institutions and external research centers, lack of financial and moral support, and low prioritization by authorities.	1-3; 5; 12-16; 22; 28; 30
Insufficient Budget and Resources	- Participant 29: "There is no sufficient or dedicated budget for research in educational	Lack of modern research tools, financial constraints, insufficient funding allocation, and	1; 3-5; 8-10; 12; 13; 18; 19; 23-30

	institutions." - Participant 4: "Financial constraints hinder purchasing equipment and travel for research."	absence of dedicated research departments.	
Weak Research Culture	- Participant 29: "Weak motivation and absence of a unified framework weaken research culture." - Participant 25: "Academic activities have low social value, which discourages research."	Lack of publication opportunities, inadequate emphasis on research, absence of legal/academic frameworks, and weak collaboration.	2; 3; 14; 20; 25-30
Limited Access to Updated Resources	- Participant 1: "Access to primary and up-to-date resources is difficult, especially in sensitive fields." - Participant 29: "Many academics lack access to global research databases and modern materials."	Insufficient data, limited access to digital/physical books, outdated tools, and poor accessibility to international databases.	1; 4; 5; 8; 15; 18; 20; 23; 24; 27; 29
Political-Legal-Economic Instability	- Participant 16: "Political and economic instability negatively impacts the research environment." - Participant 20: "Unpredictable conditions hamper consistent research activities."	Economic difficulties, political instability, and their adverse effects on the research environment.	16; 20
Shortage of Specialized Researchers	- Participant 6: "Many academic staff lack familiarity with modern research methods and techniques." - Participant 14: "There is a lack of skilled researchers and insufficient knowledge of data analysis software."	Lack of skilled research staff, insufficient expertise, limited proficiency in international languages, and inadequate human resources.	6; 7-10; 12; 14; 17; 19; 23-28; 30
Low Motivation and Interest in Research	- Participant 6: "Lack of strong will among the academic community to use modern research methods demotivates newcomers." - Participant 29: "Limited interest and reliance on others' research efforts."	Weak motivation among researchers and students, lack of clear objectives, and dependence on others.	1; 2; 9; 10; 12; 15; 18; 20; 23; 27-29
Promotion-Oriented Nature of Public Educational Institutions	- Participant 11: "Research is seen mostly as a way to get	Research is considered an administrative process primarily for academic rank	11

	promotions, not for scientific contribution."	advancement rather than genuine scientific inquiry.	
Profit-Driven Nature of Private Institutions	- Participant 11: "Private institutions focus on profit; research funding is minimal, and teaching loads prevent research." - Participant 3: "Research is commercialized, causing quality decline and plagiarism."	Overemphasis on revenue generation, limited research funding, and increased teaching hours leave no time for research.	11; 3

Theme Three: Strategies to Address Challenges and Strengthen Research

Participants identified several key strategies to overcome challenges and enhance scientific research in Afghanistan's educational institutions:

Comprehensive Support for Scientific Research

Comprehensive support for scientific research involves providing researchers with a full range of resources and services that enable them to conduct effective and efficient studies. This includes access to funding, advanced laboratory facilities, technical expertise, data management tools, and collaborative networks that foster interdisciplinary work. Additionally, researchers benefit from administrative support in navigating grant applications, complying with ethical standards, and publishing. Such holistic backing not only accelerates scientific discovery but also ensures rigor and reproducibility in research outcomes (National Academies of Sciences, Engineering, and Medicine, 2017). *Participants (1-3; 8; 10-16; 18; 19; 23-29; 30) emphasized the necessity of broad financial and moral support for researchers. For example, Participant 18 noted:*

> *"Financial backing and valuing scientific research are essential for progress." Participant 29 further suggested that national and international institutions could provide research insurance, ensuring stability and confidence for researchers.*

Provision of Adequate Infrastructure and Access

Strengthening research requires improved infrastructure, including research centers and enhanced access to global academic networks. *Participants 17 and 30 stressed the importance of fostering collaboration with international institutions to enable knowledge exchange and resource sharing.*

Capacity Building through Training

Short and medium-term training programs, both locally and abroad, are critical for equipping researchers with modern methodologies. *Participant 29 recommended enabling researchers to learn contemporary techniques internationally, while Participant 17 highlighted continuous skill development.*

Motivating Researchers

Motivating researchers is essential for driving innovation and sustaining productivity in scientific fields. Intrinsic factors, such as curiosity, passion for discovery, and the desire to contribute to societal progress, often fuel researchers' commitment. Extrinsic motivators, including competitive funding, recognition through awards and publications, and supportive institutional environments, also play a crucial role. Creating a culture that values autonomy, collaboration, and continuous learning can significantly enhance motivation, leading to higher-quality research and greater job satisfaction (Deci & Ryan, 2000). *Financial incentives, recognition, and practical application of research findings can increase researcher motivation. Participants 5, 10, and 29 underlined that motivating researchers directly influences research productivity and quality.*

Promoting a Research Culture

Building a strong research culture within academic institutions and society is a long-term strategy. Participant 26 recommended systematic evaluation and transparent reporting of research outcomes to foster accountability and engagement.

Mandatory Research Policies with Flexibility

While not advocating coercion, some participants (14, 23, 5) supported policies that encourage academic staff to engage in research, for example, by reducing their teaching loads to free up time for research.

Integration with Research Objectives

These strategies directly respond to the research objectives by providing actionable solutions to the identified challenges. They emphasize the role of institutional support, capacity building, and cultural change in strengthening research, thereby advancing academic excellence and national development.

Table 8. *Summary of Strategies to Address Challenges and Strengthen Research Theme*

Elements	Excerpts from Interviews (Selected Quotes)	Insights	Specific Participant Codes
Scientific Research	- Participant 18: "Financial backing and valuing scientific research are essential to empower researchers." - Participant 29: "National and international institutions should ensure scientific research to provide stability."	Comprehensive support, including financial and moral backing, is crucial to overcoming research challenges and empowering researchers.	1-3; 8; 10-16; 18; 19; 23-29; 30
Providing Comprehensive Support	- Participant 18: "Research insurance by national and	Financial and moral support, including insurance mechanisms,	18; 29

	international organizations can protect researchers from risks." - Participant 29: "Moral support encourages researchers to persist despite difficulties."	provides researchers with the necessary security and encouragement.	
Enhancing Infrastructure and Access	- Participant 17: "Establishing research centers and providing up-to-date resources are fundamental." - Participant 30: "Collaboration with international institutions expands research capabilities."	The development of infrastructure and fostering collaborations improve research quality and accessibility.	17; 30
Capacity Building	- Participant 29: "Training programs and opportunities to study modern methods abroad are vital to build research skills." - Participant 17: "Short- and medium-term workshops can quickly enhance researcher capabilities."	Training and education, locally and internationally, are key to developing researchers' skills and modern methodologies.	17; 29
Motivating Researchers	- Participant 5: "Financial incentives and recognition motivate researchers to produce better work." - Participant 29: "Practical application of research results encourages more engagement."	Incentives, rewards, and the demonstration of research impact increase motivation among academic researchers.	5; 10; 29
Promoting a Research Culture	- Participant 26: "A strong research culture supported by systematic evaluation helps maintain research quality."	Cultivating a research culture in academic and social spheres ensures the sustainability of research efforts.	26

Table9. *Summary of Recommendations for Enhancing Scientific Research in Higher Education Institutions of Afghanistan*

Strategy	**Recommendation Components**	**Key Points**
Research Infrastructure	Strengthening Research Facilities	- Establish modern laboratories, digital libraries, and dedicated research centers.

Expanding Internet Access	- Improve high-speed internet coverage, focusing on rural and underserved regions.

Theories of scientific research, especially within the context of Afghanistan's higher education, provide valuable insights into the challenges, solutions, and strategies for improving research. These frameworks highlight opportunities and challenges across human resources, processes, and infrastructure. For example, the importance of quality assurance and accreditation by Afghanistan's Ministry of Higher Education is emphasized, alongside an analysis of existing barriers (Rahim et al., 2022). This theoretical grounding helps explain why some challenges persist and how targeted strategies may improve research outcomes. Improving the quality of scientific research in Afghanistan requires adopting modern technologies, supporting research training programs, and facilitating access to resources. However, financial and infrastructural limitations continue to hinder progress. Effective governance and academic policies that secure resources and create a conducive research environment are essential. Increased investment in education and research, and support for training programs, are practical steps to foster a research culture and capacity.

CONCLUSION

This study examined the main challenges, opportunities, and strategies to enhance scientific research in Afghan higher education institutions. Through comprehensive interviews with faculty, students, and administrators, several key factors affecting research development were identified. A crucial finding is the need to strengthen research capabilities among faculty members and students. Scientific research is vital not only to academia but also to national development. Practical training in research methodologies and data analysis is fundamental. Establishing adequate infrastructure, including financial support and access to information technology, is necessary to facilitate quality research and increase access to scientific literature and international journals. Funding localized research focused on Afghanistan's specific social, economic, and cultural challenges can yield practical and scientific solutions. Key stakeholders in this process include university faculty, presidents, academic vice presidents, research department heads, and graduate students. Building their skills and capacities can significantly improve research quality. Leadership at universities can foster research growth through policy development and academic planning. Research leaders at national institutions play a critical role in implementing applied, high-quality research. Graduate students and recent graduates can contribute by investigating real community needs. Further research should examine technological factors that affect student engagement and learning outcomes. Innovative methods such as online photovoice and community-based participatory research could enhance understanding and access to digital learning, especially in post-conflict settings. These approaches empower communities by involving them directly in co-creating inclusive digital learning solutions.

AUTHORS' CONTRIBUTIONS

- Rohullah Samim (Corresponding author) conceptualized and supervised the study.
- Muhammad Ishaq Noori investigated and analyzed the data.
- Rohullah Samim wrote the manuscript with input from all authors.
- All authors reviewed and approved the final version of the manuscript.

CONFLICT OF INTEREST STATEMENT

The authors reported no potential conflict of interest.

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The authors declare that they have no conflict of interest.

DATA AVAILABILITY STATEMENT

All data generated or analyzed during this study are included in this published article and its supplementary information files (Tables S1–S3). Data are available upon request from the corresponding author, subject to ethical approval.

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