UNLOCKING OPPORTUNITIES OF FOREIGN RESEARCH FUNDING IN DEVELOPING COUNTRIES: THE CASE STUDY OF EGYPT

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ABSTRACT

Research and development (R&D) is vital for economic growth, and external funding is crucial for developing countries like Egypt to compete globally. The European Union (EU) Framework Programs (FPs) offer significant funding opportunities, but challenges in accessing these funds remain underexplored for countries like Egypt.

This study examines Egypt's participation in EU FP funding, focusing on the challenges faced by academic institutions and areas for improvement. Using a mixed-methods approach, the study combines an analysis of funding distribution with a survey of Egyptian faculty who have applied or expressed interest in EU FP funding.

The findings show that Egypt's share of EU FP funding is modest, with a low success rate in securing projects. Key barriers include limited institutional support and a need for better project management skills. Opportunities for improvement include establishing grant support offices in universities and introducing internal grants for pilot projects.

The study concludes that national and institutional efforts are essential to improve Egypt's success in securing EU research funding. Recommendations include creating support offices, increasing resource visibility, and offering internal grants to enhance international collaborations and boost Egypt's research ecosystem.

Keywords

EU Framework Programs; research funding; research grants; developing countries; faculty survey

INTRODUCTION

Research and development (R&D) is a cornerstone of economic growth and societal progress. For developing countries like Egypt, access to external funding for R&D is crucial to bridge the gap with developed nations. The European Union (EU) emerges as a significant player in this arena, providing substantial financial support for research activities in partner countries. Much of that support is channeled through the EU Framework Programs (FPs).

The European Union Framework Programs for Research and Technological Development have been a cornerstone of EU innovation policy since 1984 (Arnold, 2012). These programs have evolved significantly over time, with increasing budgets and impact (Duarte, 2016) The first Framework Program (1984-1987) was followed by subsequent programs, each building on the previous one and adapting to changing priorities (Mandenoff, 1992.)

Starting with Horizon 2020, framework programs stopped targeting developing countries with specific calls (Niederoest & Baltsavias, 2002) and they were more encouraged to seek EU partners (Feld & Kreimer, 2019). This made the process more complex for developing countries and a new variable came into play. The developing

country's "funding affinity" has been shown to be an important attribute in stimulating further collaborative innovation activities. A recent study examining EU R&D funding allocations found that success in securing funding was linked to the fund recipient's innovation performance and to the technological distance between the organizations in a network or consortium. Interestingly, the degree of technological distance among partners had a positive and significant association with the likelihood of receiving funding from the program, suggesting that organizations that join networks with technologically distant partners have a higher probability of success. Furthermore, the study found that organizational distance among partners had a positive impact on the likelihood of being awarded funding due to a higher perceived network capacity (Marullo et al., 2024). It was also shown before that funded organizations are more capable of leveraging additional internal funding for innovation or attracting additional equity financing (Mulier & Samarin, 2021).

Despite the growing body of research on EU-funded research programs, there remains a knowledge gap regarding the specific challenges and opportunities faced by developing countries like Egypt in accessing and utilizing these funds, as well as understanding the disparities in participation and funding allocation among different countries, institutions, and research fields. Therefore, a comprehensive analysis of Egypt's participation in EU-funded research programs is important to elucidate the factors influencing the country's access to these funds, and to identify potential areas for improvement in the EU-Egypt research collaboration.

This paper delves into Egypt's participation in EU-funded research programs. We examine the extent of financial support Egypt receives, the evenness of its distribution, in addition challenges to attracting more EU funds. By understanding the dynamics of EU-Egypt research collaboration, this study aims to contribute valuable insights for policymakers and researchers on both sides.

Egypt´s Participation in Research and Innovation Framework Programs

Value of FP Funding for Egyptian Research

The impact assessment of the European Union's framework programs, such as Horizon Europe and its predecessors, Horizon 2020 and FP7, is a complex process that requires a multi-level analysis. The formal evaluations, which are typically conducted midway through the programs, provide valuable insights into the effectiveness of these initiatives. However, these evaluations often face challenges related to the attribution of effects and pre-competitiveness, making it difficult to directly link participation in these programs to several factors such as the economic performance and success of the firms (Luukkonen, 1998). Despite these challenges, there is cumulative evidence of the importance of these programs for firms and research institutions, particularly in terms of fostering interdisciplinary research and collaboration across sectors and policy fields, thereby enhancing flexibility, focus, and impact (Wilkinson, 2024).

These programs have also been shown to have intangible, infrastructural effects, such as enhancing learning and skill development, influencing brain circulation and the formation of lasting collaborative networks. Radwan and Sakr (2018) emphasized the role of various European funding schemes in stimulating brain circulation with EU-Africa collaboration, providing not only financial support but also opportunities for collaboration and knowledge exchange among diverse researchers. These funding programs have significant implications for enhancing scientific and technological competencies, especially in developing countries and regions traditionally underrepresented in research activities, and while specific data for Egypt is not readily available, these programs have generally positively influenced developing countries by building research capacity, fostering innovation, and addressing local challenges (Belli & Morín Nenoff, 2022; Wilkinson, 2024).

Is Egypt Fulfilling Its Potential in International Competitive Research And Innovation?

The availability of data through the CORDIS database made it possible to do several studies analyzing the characteristics and impact of EU funding programs (Feld & Kreimer, 2019). In the past, Egypt was known to be among the countries making the most of EU funding opportunities. Analysis by Moskovkin and colleagues show that Morocco, Tunisia and Egypt show 1.5-2.5 times more activity in FP5 than other similar countries in the region (Moskovkin et al., 2009).

We analyzed the distribution of EU research funding from the Framework Programs FP7, Horizon 2020, and Horizon Europe, spanning the period of 2007-2023, with a focus on Egypt's position among non-EU countries. The total funds allocated across these programs amount to €130.7 billion. Of this total, the EU countries received the majority of funding totaling €118.2 billion (90%), while non-EU countries collectively received €12.5 billion. Egypt's share of this funding stands at €19.2 million (0.15% of money going to non-EU countries), placing it among the lower end of non-EU recipients. Comparatively, the highest recipient among non-EU countries is China, which alone received over one-third of non-EU money, indicating a significant disparity in funding allocations. This data underscores Egypt's relatively modest share of EU research funding compared to other non-EU countries, highlighting the need for increased support and investment to further enhance Egypt's research and innovation capabilities.

Another finding from our analysis is related to the type of Egyptian organizations that take part in EU funded programs. EU framework programs open their funding to several types of organizations including research institutions, higher education organizations, public bodies, private for-profit entities (Feld & Kreimer, 2019). Apart from universities and public research institutes (**Figure 1**), and despite the continuous encouragement for university-industry collaborations, only 11 of Egyptian organizations (17%) are for-profit entities.

Figure 1
Distribution of Egyptian Organization Types

While several Egyptian organizations (a total of 64) actively participate in FPs, the involvement vary significantly. The most active of these is the Academy of Scientific Research and Technology (ASRT), which has been involved in 24 projects as Egypt's national academy. Additionally, Cairo University has participated in 11 projects, demonstrating its active engagement in EU-funded initiatives compared to other major public universities. Other notable participants include the National Research Center, Alexandria University, and the Agricultural Research Center with 10, 9, and 8 projects, respectively.

In attempting to quantify the unevenness of funding affinity of different Egyptian organizations, we calculated the Herfindahl-Hirschman Index (HHI) for all countries for comparison. The Herfindahl-Hirschman index is a statistical measure of concentration originally used to analyze the competitive effects of mergers (Rhoades, 1993), but it is also used in several other academic contexts. We use it to determine whether some organizations in a given country monopolize the grant awards within their participation in different European FPs. The HH-index ranges from near zero, which indicates perfect or monopolistic competition, to ten thousand, representing a pure monopoly. If the HHI is below 1500, the market is considered competitive. A score between 1500 and 2500

suggests moderate concentration, while a score above 2500 indicates a highly monopolistic environment (Pavic et al., 2016), meaning a small number of organizations gets most of the EU FP funding.

We analyzed competitiveness in two ways. First, the index was calculated based on the amount of funding received by different organizations in the same country to assess the distribution of financial resources. Second, the calculation was based on the number of projects in which each organization participated. In both scenarios, Egypt exhibited a competitive environment (HH-index equals 494 and 482 in both calculations respectively). **Table 1** below gives an overview of the situation (measured by budget share) in all 195 countries covered by the Cordis database.

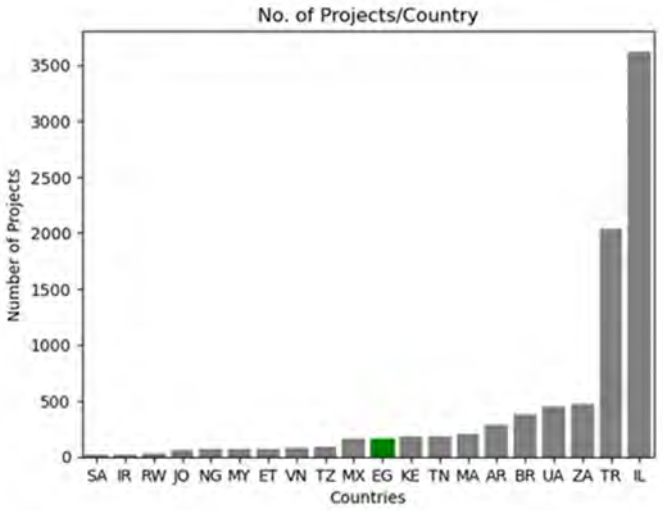
Table 1
State of Countries Presented in the Database

HH index Value	Status	Country Count
<1500	competitive	92
1500-2500	medium	20
>2500	monopoly	83

Despite the competitive environment suggested by the HHI calculations, where Egypt demonstrated a balanced distribution of funding and project participation among organizations, the overall low number of approved projects indicates that the country is not fully realizing its potential (**Figure 2**).

This disparity suggests that while competition exists, the limited success in securing project approvals may point to underlying challenges, such as inefficiencies in project proposals, insufficient resources, or structural barriers, which hinder the full realization of the country's capabilities. This paper sets out to identify these challenges and to give recommendations enabling Egypt to fully realize its susceptibility to EU funding.

Figure 2
Distribution of Projects by Country



Empirical Study

In attempting to understand the reasons behind this unrealized potential, our study explores a number of factors contributing to Egypt's share of EU research funding. The focus here is primarily on the grant application experiences of Egyptian faculty members, and the effectiveness of different institutional and governmental support tools available to them.

A recent systematic review laid the groundwork for understanding barriers and facilitators to the faculty grant writing activities. By reviewing existing literature covering many studies (collectively covering 1,593 faculty member participants), authors identified eight key factors that facilitate or hinder grant application among faculty members. These are: 1. Grant proposal development support; 2. Time commitments, assignments, and priorities; 3. Funding or resources from the university; 4. Personal interests, knowledge, or attributes of faculty; 5. Sponsored research administration (SRA) (i.e., grant submission and management) policies, personnel, and support; 6. Evaluation, tenure, and promotion; 7. Scholarly network; and 8. Scholarly climate (Goff-Albritton et al., 2022)

A short questionnaire was developed based on these key factors. It consisted of three sections (biographic data, faculty grant activity and institutional support).

The Egyptian Knowledge Bank (a government initiative to provide access to academic literature for Egyptian universities) in collaboration with the Academy of Scientific Research & Technology (Egypt's national academy) organize a series of grant writing workshops at different universities and research institutes across Egypt. During these workshops, experts from EKB and ASRT explain to academics the different foreign grant opportunities available to Egypt and teach them techniques to master the grant writing and application process. We targeted the population of faculty members attending these workshops.

Respondent Profiles

The questionnaire was sent by email to 250 faculty members who participated in five of these workshops taking place in the period between April 2023 and June 2024. We received 76 responses (a response rate of 30%). Respondents belonged to 34 different academic institutions. Egypt has 66 universities and a smaller number of public research institutes (depending on the definition), which suggests that responses to our survey cover a good number of experiences from different institutions.

There was also a good balance of perspectives between those who were granted one foreign grant before (37% of respondents), those who were awarded multiple times (28%), those who attempted applying but were never granted (24%) and those who never applied (9%). This is interesting given that junior faculty (assistant professor and lower) were not well represented, as most respondents (82%) held more senior academic ranks (associate and full professor). In principle, all academic disciplines were covered in our sample.

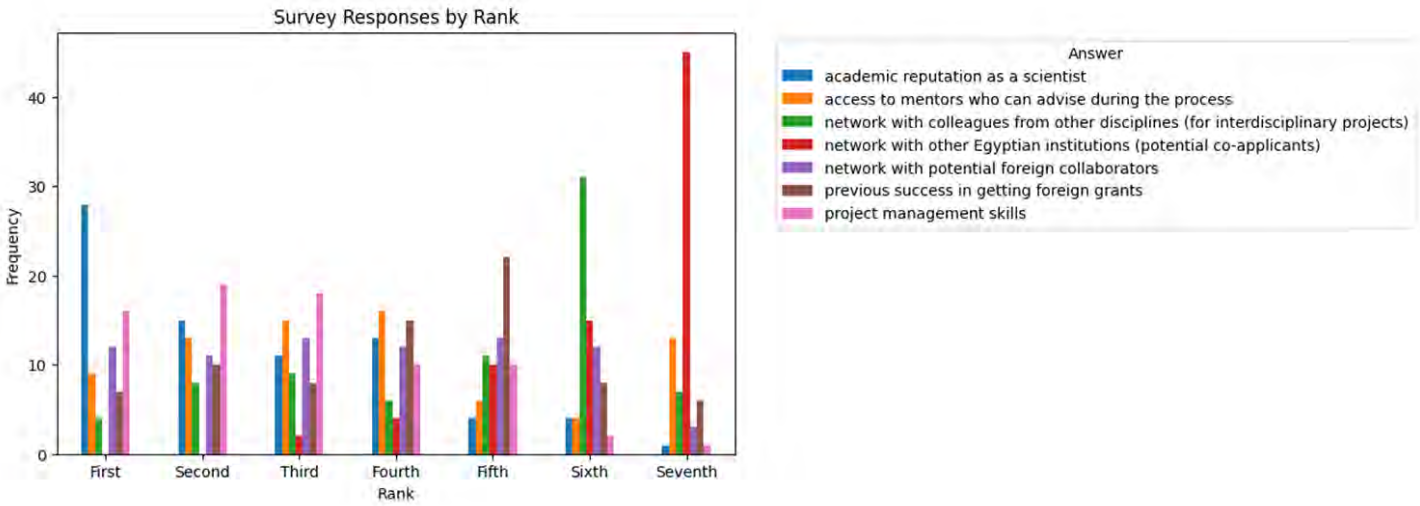
Foreign Grant Application among Egyptian Scientists

Motivation

Over 70% of respondents chose "it's good for my reputation as a researcher" as their motivation for applying to foreign research grants (**Figure 3**). This was overwhelmingly more than the following reason ("researchers who receive grants are valued at my institution") chosen by only 12% of respondents.

Concerns for reputational gains appears more common among junior faculty though, which is understandable as many of them are in the process of building their academic careers. Only five respondents (7%) cited the expectation of financial return as their motivation. This is surprising given the relatively low levels of academic salaries in Egypt. University regulations in Egypt allow faculty members to gain extra income through the personnel costs line item in research grants, or indirectly through teaching buyout.

Figure 3
The Distribution of The Survey Answers



Capacity Building Needs

Several skills are required for faculty members to be competitive and successful in grant writing and application. Needless to say, and especially for EU grants, the application process is complex and involves many steps (Niederoest & Baltsavias, 2002). In our study, participants were asked two questions with the same set of choices given as potential answers, namely a set of factors critical to the grant application process. The first question solicited respondents' ratings of the factors in terms of their perceived importance, while the second question prompted them to identify which factors they personally required capacity building to effectively address. Established academic reputation emerged as the most highly ranked factor contributing to success in securing subsequent grant awards.

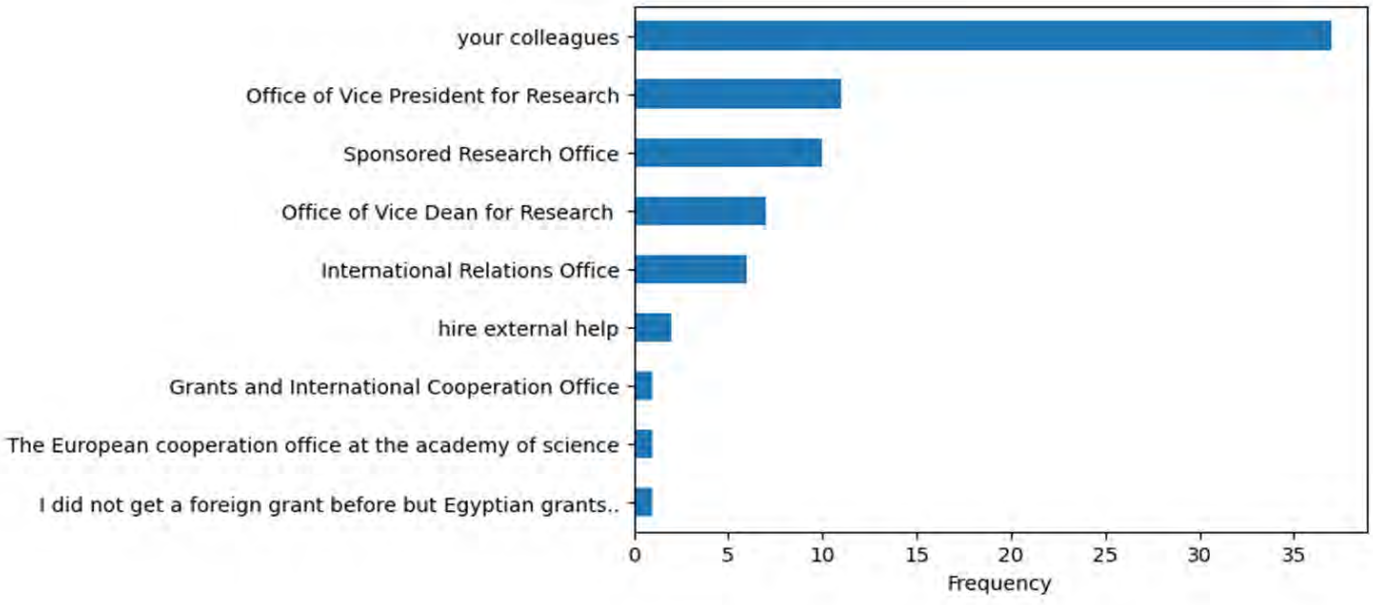
The majority of respondents (62%) identified "project management skills" as a key area for personal capacity building. Notably, a significant proportion (approximately 80%) of those who prioritized project management skills were faculty members with a history of successful grant awards, having received at least one award in the past. Those with no prior grant management experience perceive factors other than project management skills to be of value. The second factor, albeit with a significantly lower frequency, was "access to mentors who can advise during the process", which was selected by only 13% of respondents. This finding is noteworthy, given that mentorship was ranked fourth in terms of importance for grant success, closely following "network with potential foreign collaborators".

Institutional Support Measures

The survey results provide an insightful perspective on the support mechanisms utilized by Egyptian researchers when applying for foreign grants. A majority of the respondents (49%) indicated that they seek assistance from their colleagues, as shown in **Figure 4**. This finding aligns with the theory of social capital (Bourdieu, 2002), which posits that individuals tend to derive benefits from their social networks, including the exchange of knowledge and information, especially in the absence of existing support measures.

In contrast, a smaller proportion of respondents reported seeking help from institutional entities (collectively 37%) such as the Sponsored Research Office, the Office of the Vice Dean for Research and the International Relations Office. This suggests that while these offices play a role in supporting grant applications, their impact may be less pronounced than the informal support provided by colleagues.

Figure 4
The Distribution of Support Channels



In this respect, previous empirical work showed that guided and structured support provided to applicants for grants significantly enhances the success rate of grants (Kulage et al., 2022; Porter 2003), which means there is room for Egypt's unrealized potential (in EU research funds) to be addressed.

These findings underscore the importance of fostering collaborative environments within research institutions to facilitate knowledge exchange and support in grant applications. However, they also highlight the need for institutions to enhance the visibility and accessibility of their support services to better assist researchers in securing foreign grants (Radwan et al., 2014). Respondents were given a list of 11 potential services academic institutions can provide in the journey of applying for and managing foreign grants. The idea was to explore the range of services Egyptian institutions provide in this regard and the extent of which these services cover the entire span of involved activities. Answers are shown in **Table 2.**

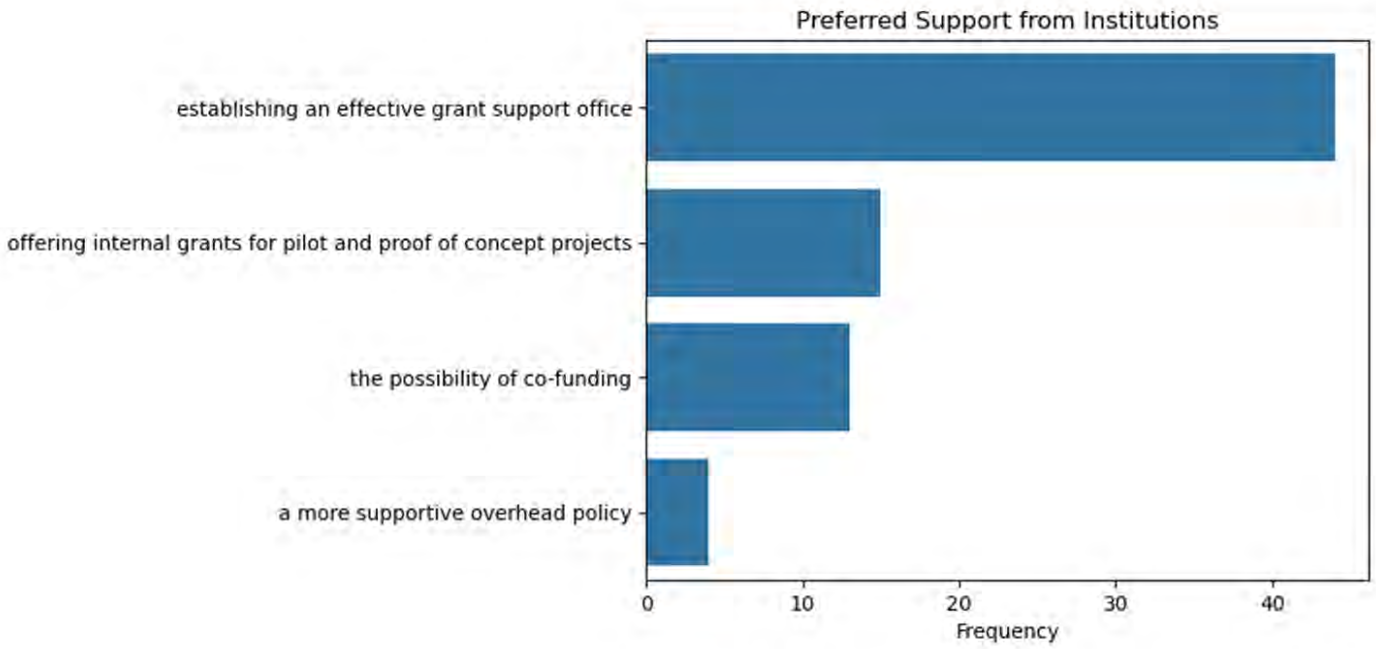
It appears that the majority of support available to Egyptian faculty members through their institutions is related to the administrative requirements of grants (financial reporting, approvals, etc.). Conversely, technical support was the least provided, aligning with the concerns usually raised about the inadequacy of technical guidance in managing externally funded projects (Andrade & Kollen, 2012). It is, however, concerning that the majority of respondents (58%) mentioned that their institutions offer none of these services. This may indicate that support is available in a small set of active institutions, but not others. Researchers in existing literature identified a trend where a substantial number of institutions lacked structured mechanisms for foreign grant facilitation, potentially undermining their researchers' competitiveness on the global stage. (Cassola et al., 2022; Wedekind & Philbin, 2018). Support in early-stage steps (e.g. contacting funders, proposal review and contract negotiation) were also notably recognized (25%), agreeing with the findings of (Radwan et al., 2014; Wedekind & Philbin, 2018) that emphasized the importance of early engagement with funders or relevant calls of proposals and thorough proposal vetting in securing grants.

When asked to identify areas where their institutions could provide additional support, the majority of respondents (58%) prioritized the establishment of an effective grant support office. This aligns with the findings of a study by Wedekind and Philbin (2018) which highlighted the role of a university-based structure in providing focused support across the entire grant project lifecycle. This supporting structure was found to act as an advisor or trainer, advising researchers on grant requirements and the feasibility of the project idea.

Table 2
Distribution of Responses Given

Response	Frequency
Help in financial reporting	20
Facilitating necessary approvals and signatures	14
Help in identifying/finding funding opportunities	10
Proposal review	7
Support in contacting funders (for questions and inquiries)	6
Grant writing services	4
Accounting and processing of payments	4
Achieving compliance with grant requirements	4
Help in preparing the budget	3
Contract negotiation	3
Help in technical reporting	1
None of the above	44

Figure 5
The Distribution of Preferred Support



The second most preferred support mechanism was the offering of internal grants for pilots and proof of concept projects (20%). This is consistent with the view that such internal funding programs can initiate the exploration of research projects, enabling them to subsequently secure external funding (Mulier & Samarin, 2021; Radwan et al., 2014). This is also in line with the following mechanism (possibility of home institution co-funding), which was chosen by 17% of respondents. These findings also underscore the need for institutions to prioritize the establishment of effective grant support offices (Radwan et al., 2014; Wedekind & Philbin, 2018).

Among the places respondents seek support during their grant application and management journey, only two respondents reported hiring external help, and one respondent mentioned the EU Cooperation Office in the National Academy to be a source of support. Relatively low dependence on sources outside the institutions could mean that awareness about institutional support services may not be an issue. The problem lies mainly in how effective those institutional support mechanisms are.

CONCLUSION & RECOMMENDATIONS

This study aimed to investigate Egypt's engagement with European Union Framework Program (EU FP) funding, analyzing the challenges and opportunities faced by Egyptian academic institutions in securing research grants. The findings of this study reveal that despite recent progress, Egypt's overall share of EU FP funding remains modest compared to peer countries, suggesting a need for strategic improvements.

The analysis of funding distribution and survey of Egyptian faculty members identified key barriers, including limited institutional support mechanisms and a low success rate of submitted projects to competitive funding programs. The study highlights the importance of establishing effective grant support offices within Egyptian universities, enhancing visibility of available resources, and introducing internal grants for pilot projects. These measures can enhance Egypt's success in the competitive EU research funding landscape, fostering stronger international collaborations and contributing to the nation's research and innovation ecosystem.

Our findings underscore the significance of project management skills, with 62% of respondents identifying this as a key area for personal capacity building. Furthermore, the study reveals that a significant proportion of faculty members with a history of successful grant awards prioritize project management skills, emphasizing the need for targeted support in this area.

The findings also highlight the importance of institutional support mechanisms, with a majority of respondents seeking assistance from colleagues rather than institutional structures. This suggests that while informal support networks are valuable, there is a need for institutions to enhance the visibility and accessibility of their support services to better assist researchers in securing foreign grants.

In conclusion, this study provides valuable insights into the challenges and opportunities faced by Egyptian academic institutions in securing EU FP funding. The findings and recommendations of this study can inform policymakers and researchers on both sides, enabling the development of targeted strategies to enhance Egypt's research and innovation capabilities. By addressing the identified barriers and implementing the recommended measures, Egypt can increase its success rate in securing EU grants and ultimately make better use of this valuable resource to further its development goals.

AUTHORS' NOTE

Disclosure of interest:

The authors report there are no competing interests to declare.

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