Building Research Capacity and Promoting Collaboration Through Grant Writing: Lessons From Ukrainian Universities

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Abstract: This study examines the state of grant writing practices in Ukrainian universities and proposes recommendations to enhance their capacity to secure external funding for research and development. Through a mixed-methods approach involving surveys and semi-structured interviews, data was gathered from researchers and faculty members. The study identifies challenges faced by Ukrainian universities in obtaining external funding and highlights important themes for improving grant-writing practices. These themes include promoting collaboration, providing resources and infrastructure, implementing language support policies, raising awareness of funding opportunities, offering institutional support, fostering a research culture, establishing internal grant review processes, leveraging international collaborations, and emphasising evaluation and learning. By addressing these themes, Ukrainian universities can improve their grant-writing practices, increase proposal competitiveness, and enhance success rates in securing external funding. This study provides valuable insights, complements existing literature, and offers practical recommendations for grant writing in Ukrainian universities.

Keywords: *External funding, higher education, grant writing practices, research capacity, Ukrainian universities.*

Introduction

In recent years, the realms of research and development have emerged as powerful catalysts for economic growth and social advancement in Ukraine (Sbruieva, 2010; Sytnyk, 2019). This growing acknowledgment of the pivotal role of research in national progress underscores the urgency of addressing the multifaceted challenges embedded within Ukraine's research and innovation landscape. While the recognition of the central role of research is clear, Ukraine grapples with a persistent predicament characterised by low research output, both in terms of quantity and quality (Halevi, 2022). These limitations have not only hampered Ukrainian universities' ability to make a global impact in terms of research productivity and excellence but have also stymied their capacity to effectively compete on the international stage (Halevi, 2022). The reasons underlying this complex predicament are multifaceted and deeply entrenched. First and foremost, Ukraine's enduring economic challenges, coupled with political instability, have given rise to a challenging environment where the pursuit of external funding for research projects has become an increasingly formidable endeavour. Consequently, many Ukrainian researchers find themselves navigating treacherous waters, grappling with limited resources, and confronting the arduous task of identifying potential collaborators and partners.

Recognising the multifaceted nature of these challenges, it becomes clear that enhancing the practical knowledge and skills of Ukrainian researchers in the domains of grant writing and collaboration is not merely an aspiration but an absolute imperative (Kiopa et al., 2020; Reshetnyak, 2020). Against this backdrop, the significance of building research capacity and fostering collaboration among Ukrainian universities and researchers emerges as a pressing need (Kachynska, 2022). These initiatives are perceived as crucial steps toward bridging the prevalent research gap and catalysing scientific progress within the country. However, this noble endeavor faces a formidable adversary in the form of inadequate funding and limited resources. The repercussions of this funding shortfall are profound and palpable — a constrained number of research projects and publications originating from Ukrainian universities and research institutions. This, in turn, impedes the nation's scientific advancement on the global stage, leaving it in a perpetual state of catch-up (Akbash et al., 2020; Halevi, 2022; Nazarovets, 2022). In light of this intricate landscape, the need to conduct

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a comprehensive study aimed at identifying the precise barriers obstructing successful grant writing and collaboration within Ukrainian universities becomes both evident and urgent. This study is poised to offer not just a diagnosis of these barriers but, more crucially, a prescription — a set of concrete recommendations meticulously designed to enhance the capacity of these institutions to secure external funding for research and development initiatives. It is within this context that the research gap that this study seeks to address emerges as a critical juncture — one where insights transform into action, and where aspirations translate into tangible progress. Therefore, this study is not merely an academic pursuit; it is a clarion call to navigate the complex web of challenges entwined with Ukraine's research and innovation landscape. It is an ode to resilience, a testament to the nation's enduring commitment to progress, and an unwavering belief in the transformative power of research and collaboration. This research endeavours to illuminate a path forward, one where the pursuit of knowledge knows no bounds, and where the potential for scientific discovery finds its truest expression.

Literature Review

The literature on research capacity building and collaboration within research institutions and higher education institutions presents a multifaceted landscape, offering insights into both the strengths and limitations of these endeavours (LSTM Center for Capacity Research & ESSENCE on Health Research, 2023; Huenneke et al., 2017; Kachynska, 2022; United Nations Educational, Scientific and Cultural Organization, 2023). Among these facets, the role of grant writing emerges as a pivotal one, shaping research outcomes and collaborative networks (Guyer et al., 2021).

Despite the growing recognition of research capacity building and collaboration's importance, Ukrainian universities face persistent challenges in these domains. Primary among these challenges is the restricted access to external research funding sources, which hampers their efforts in enhancing research capacity and fostering collaborative networks (Bogolib, 2016; Luhovyi et al., 2021; United Nations Development Programme, 2022).

The economic and political landscape of Ukraine has further compounded these challenges. The scarcity of funding opportunities has compelled many Ukrainian researchers to rely on personal resources or navigate the complex terrain of seeking collaborative partnerships (Kiopa et al., 2020; Nazarovets, 2022; Reshetnyak, 2020; Sytnyk, 2019). These hurdles underscore the imperative need to bolster the practical knowledge and skills of Ukrainian researchers in grant writing and collaboration.

A closer examination of the literature reveals several insights and recommendations for addressing these challenges. Kiopa et al. (2020) advocate for the establishment of comprehensive training programs and workshops to equip Ukrainian university researchers with advanced grant writing and project management skills. Reshetnyak (2020) emphasises the provision of enhanced support and resources, including access to databases and funding opportunities, as crucial measures to empower researchers in securing external funding for their projects.

Moreover, research has identified factors contributing to successful grant writing and collaboration within higher education institutions. Guyer et al. (2021) have identified best practices such as the formulation of a well-defined research plan, the articulation of the potential impact of proposed research, and the alignment of budgets with project goals. They also stress the significance of collaboration, particularly in the context of interdisciplinary teamwork and stakeholder engagement. Hug and Aeschbach (2020) have sought to minimise potential biases in project evaluations by establishing transparent evaluation criteria derived from comprehensive literature reviews.

Notably, the literature exposes both strengths and weaknesses in the current state of research capacity building and collaboration in Ukrainian universities. While it underscores the pivotal role of grant writing, it also highlights the stark limitations imposed by financial constraints and the need for structural reforms in higher education. Furthermore, it showcases the dynamic nature of the field, with varying findings, perspectives, and recommendations from different studies. These variations necessitate critical reflection and a nuanced approach to addressing the challenges faced by Ukrainian universities in their pursuit of enhanced research capacity and collaboration. Therefore, the literature not only accentuates the importance of strengthening grant writing skills and collaborative networks but also underscores the complexities and contextual challenges inherent in these endeavours. It is crucial to recognise the multidimensional nature of these issues, appreciating both their strengths and limitations, to chart a more effective course for the future of research and innovation in Ukrainian universities.

The primary objective of this research is to comprehensively assess the existing landscape of grant writing practices within Ukrainian universities, with a particular focus on understanding the challenges and barriers faced in the process. Furthermore, this study aims to formulate a set of actionable recommendations aimed at augmenting the capacity of these academic institutions in securing external funding for research and development initiatives.

To achieve this overarching goal, the following research questions will guide our investigation: 1. What is the current state of grant writing practices in Ukrainian universities?

2. What are the key impediments that hinder successful grant writing within these institutions?

3. What specific measures and strategies can be implemented to strengthen the grant writing capacity of Ukrainian universities, thereby enabling them to secure external funding for research and development more effectively?

Methodology

The study employed a mixed-methods research design, which involved conducting a survey and semi-structured interviews to gather data from Ukrainian researchers and faculty members (George, 2021). The survey questionnaire (see Appendix A) was developed by the research team based on the research questions and shared online to collect both closed-ended and open-ended responses. A cross-sectional survey design was employed to collect data on grant proposal writing experiences, external funding agencies applied to, grant writing culture, and training opportunities (Hunziker & Blankenagel, 2021). Meanwhile, purposive sampling was used to select participants with substantial experience in grant writing for the semi-structured interviews (see Appendix B for the questionnaire) which were conducted via ZOOM or Google Meet video conference, recorded and transcribed. Both a survey and semi-structured interviews were conducted to collect raw data, which were initially reported in Ukrainian. The reported data were subsequently translated into English.

The recommendations to enhance the capacity of Ukrainian universities to secure external funding for research and development were derived from the analysis of the data. These recommendations were based on the barriers identified in successful grant writing and collaboration in Ukrainian universities and best practices from other countries with thriving grant writing and collaboration cultures. The study consisted of 5 phases which are presented in Figure 1. Ethical approval for the study was obtained from the Board of Academics for the Institute of Public Administration and Research in Civil Protection.
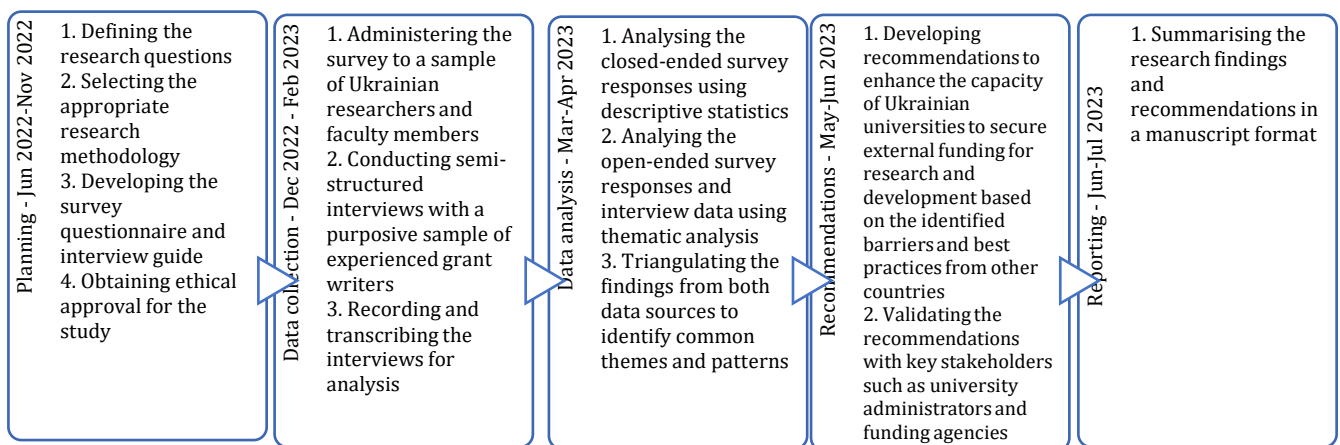
Planning - Jun 2022-Nov 2022	Data collection - Dec 2022 - Feb 2023	Data analysis - Mar-Apr 2023	Recommendations - May-Jun 2023	Reporting - Jun-Jul 2023
1. Defining the research questions 2. Selecting the appropriate research methodology 3. Developing the survey questionnaire and interview guide 4. Obtaining ethical approval for the study	1. Administering the survey to a sample of Ukrainian researchers and faculty members 2. Conducting semi-structured interviews with a purposive sample of experienced grant writers 3. Recording and transcribing the interviews for analysis	1. Analysing the closed-ended survey responses using descriptive statistics 2. Analying the open-ended survey responses and interview data using thematic analysis 3. Triangulating the findings from both data sources to identify common themes and patterns	1. Developing recommendations to enhance the capacity of Ukrainian universities to secure external funding for research and development based on the identified barriers and best practices from other countries 2. Validating the recommendations with key stakeholders such as university administrators and funding agencies	1. Summarising the research findings and recommendations in a manuscript format

Figure 1. Phases of the Research and Activities They Covered

Sample and Data Collection

A random sampling technique was used to survey 576 representatives of 15 leading universities in Ukraine to get insights into the current state of grant writing practices in Ukrainian universities and identify the barriers to successful grant writing. The list of universities included the Institute of Public Administration and Research in Civil Protection (IPARCP), Sumy State Pedagogical University (SSPU), State University of Trade and Economics (SUTE), Lviv Polytechnic National University (LPNU), Bogomolets National Medical University (BNMU), State University of Infrastructure and Technologies (SUIT), National Aviation University (NAU), National University of Kyiv Mohyla Academy (NUKMU), Taras Shevchenko National University of Kyiv (TSNUK), The National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute" (NTUU), Kyiv National Linguistic University (KNLU), Odesa I. I. Mechnykov National University (OMNU), Zhytomyr Ivan Franko State University (ZhIFSU), "KROK" University of Economics and Law" (KROK), Ukrainian Catholic University (UCU). Table 1 provides the distribution of university roles and research areas of the respondents from the sample universities. The data for the Table 1 were drawn from Questions 1-3 of the Survey Questionnaire Entitled "Current State of Grant Writing Practices in Ukrainian Universities and Barriers to Successful Grant Writing". Figure 2 shows the distribution of the percentages of the respondents by university roles and Figure 3 displays the distribution of proportions of the respondents by research area.

Table 1. Distribution of University Roles and Research Areas in the Sample Universities

| Institution	Role	Research area	n	%
IPARCP, $n = 16$	Management	Social sciences	2	12.5
	Faculty	Social sciences	11	68.75
	Research	Social sciences	1	6.25
	Student and research	Social sciences	2	12.50
SSPU, $n = 37$	Faculty	Social sciences/Humanities	31	83.78
	Research	Social sciences/Humanities	2	5.41
	Student and research	Social sciences/Humanities	4	10.81
SUTE, $n = 61$	Faculty	Social sciences	51	83.60
	Research	Social sciences	3	4.91
	Student and research	Social sciences	7	11.49
LPNU, $n = 26$	Management	Engineering	4	15.38
	Faculty	Engineering	20	76.92
	Research	Engineering	1	3.84
	Student and research	Engineering	1	3.84
BNMU, $n = 44$	Faculty	Medical sciences	36	81.81
	Research	Medical sciences	2	4.54
	Student and research	Medical sciences	6	13.65
SUIT, $n = 23$	Faculty	Engineering	22	95.65
	Research	Engineering	0	0.00
	Student and research	Engineering	1	4.35
NAU, $n = 57$	Management	Engineering	6	10.52
	Faculty	Engineering/Social sciences	44	77.19
	Research	Engineering	3	5.26
	Student and research	Engineering/Social sciences	4	7.03
NUKMU, $n = 49$	Faculty	Social sciences	38	77.55
	Research	Social sciences	4	8.16
	Student and research	Social sciences	7	14.29
TSNUK, $n = 51$	Management	Social sciences	7	13.72
	Faculty	Social sciences	33	64.70
	Research	Social sciences	3	5.88
	Student and research	Social sciences	8	15.70
NTUU, $n = 62$	Faculty	Engineering	48	77.41
	Research	Engineering	5	8.06
	Student and research	Engineering	9	14.53
KNLU, $n = 38$	Faculty	Humanities/Social sciences	27	71.05
	Research	Humanities/Social sciences	4	10.52
	Student and research	Humanities/Social sciences	7	18.43
OMNU, $n = 46$	Faculty	Social sciences	32	69.56
	Research	Social sciences	3	6.52
	Student and research	Social sciences	11	23.92
ZhIFSU, n = 4	Faculty	Humanities/Social sciences	4	100
KROK, $n = 33$	Faculty	Social sciences	26	78.78
	Research	Social sciences	1	3.03
	Student and research	Social sciences	6	18.19
UCU, $n = 29$	Faculty	Social sciences	26	89.65
	Research	Social sciences	1	3.44
	Student and research	Social sciences	2	6.91
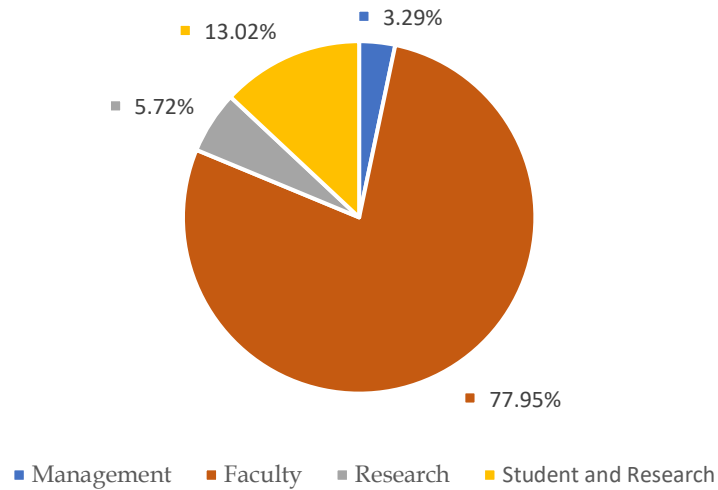
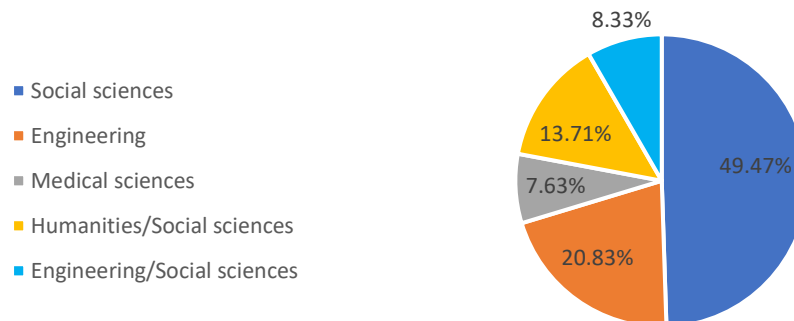Figure 2. Distribution of the Proportions of the Respondents by University Roles

Figure 3. Distribution of the Proportions of Respondents by Research Area

The data displayed in Table 1 reveals that a significant portion of the participants were faculty members, comprising 77.95% of the total respondents. This finding is further supported by the results depicted in Figure 2. Furthermore, Figure 3 provides an illustration of the research areas preferred by the respondents, with social sciences emerging as the most prominent choice at 49.47%. Engineering follows at 20.83%, while humanities/social sciences, engineering/social sciences, and medical sciences account for 13.71%, 8.33%, and 7.63% respectively.

Purposive sampling was employed to select 14 participants, one representative from each of the sampled universities, who had substantial experience in grant writing for the semi-structured interviews. The survey data was collected by electronically sharing the questionnaire via email using a shortened URL, while the research team members conducted the semi-structured interviews via ZOOM or Google Meet video conference and collected the data.

Ethical Considerations

Participants in the survey were informed about the voluntary nature of their involvement, the confidentiality of their responses, and the aim of the study, which is to understand grant writing practices and potential obstacles in Ukrainian universities. They acknowledged that their responses might be used in a scientific publication, and no risks or unfavourable outcomes were associated with their participation.

Similarly, participants in the semi-structured interview were informed about the voluntary and confidential nature of their involvement. The purpose of the interview was to gather information on enhancing the capacity of Ukrainian universities to secure external funding. Participants provided consent for their answers to be included in the scientific paper, and their participation carried no known risks. Confidentiality was ensured, and identifying information would be removed for anonymity in publication.

Data Collection and Analysis

During the data collection and analysis phase of this study, two data-gathering instruments were utilised: a survey questionnaire named "Current State of Grant Writing Practices in Ukrainian Universities and Barriers to Successful Grant Writing," and a semi-structured interview questionnaire aimed at exploring methods to enhance the grant-seeking

capabilities of Ukrainian universities. Both of these instruments underwent a rigorous validation process involving feedback from five colleagues holding PhDs in fields such as Sociology, Education, and Psychometrics.

The validation process encompassed multiple steps, including assessing the face validity of the questionnaires using a Likert scale ranging from 1 to 5. Construct validity and internal consistency were evaluated using a 5-point Likert scale. Importantly, the experts had the authority to modify any questionnaire item for refinement.

The outcome of this validation process indicated a high level of agreement among the experts, with the survey questionnaire achieving an item-level content validity index (IL-CVI) of .971, and the semi-structured interview questionnaire achieving an IL-CVI of .980. The inter-rater reliability of both instruments was established using Fleiss's Kappa coefficient, resulting in coefficients of .658 and .670 for the survey and semi-structured interview questionnaires, respectively. These values, in accordance with Polit and Beck's (2006) criteria, demonstrated good agreement among the experts, affirming the reliability and suitability of the researcher-designed instruments for the study.

The survey questionnaire was administered to 684 individuals in its Ukrainian version, yielding 576 valid responses that underwent thorough analysis. Comprising 14 comprehensive questions, the questionnaire covered demographic data, grant writing practices, barriers to successful grant writing, and general feedback. To facilitate descriptive analysis, numerical values ranging from 1 to 6 were assigned to responses for questions 4, 5, 7, 8, 11, 12, and 13, which had categorical nature.

In this phase, the survey data underwent processing using descriptive statistics to identify key trends in grant proposal writing practices and barriers to success in grant writing and grant application. Numerical data, particularly those from categorical questions (4, 5, 7, 8, 11, 12, and 13), were analysed using the Jamovi computer software (version 2.2.5) (Jamovi, 2022). This analysis employed various statistical techniques, such as frequency analysis and measures of central tendency, to examine and interpret the numerical survey responses.

Regarding semi-structured interviews conducted in Ukrainian, they were recorded via Zoom or Google Meet and then transcribed using Happy Scribe (accessible at: https://www.happyscribe.com/), an online software supporting multiple languages, including Ukrainian. The transcriptions underwent manual editing for accuracy and clarity. Qualitative data derived from the interviews underwent thematic analysis. This method involved several steps: data familiarization, generating codes, identifying themes, refining themes, data mapping, cross-verification, and report writing. These steps ensured systematic analysis and representation of key concepts and patterns.

To ensure the reliability of qualitative data analysis, multiple measures were implemented. Triangulation was applied, comparing and contrasting common themes and patterns emerging from interview data. Additionally, systematic coding and labeling of data segments were performed during thematic analysis, ensuring consistent and accurate categorisation. A comparative analysis identified similarities, differences, and contradictions in participants' perspectives and experiences, including instances of convergence or agreement among participants regarding specific themes.

Triangulation was further bolstered by comparing interview themes and patterns with data from other sources, such as surveys, observations, and existing literature. This multifaceted approach enhanced the credibility of the findings and contributed to a comprehensive understanding of the research phenomenon.

In summary, a combination of descriptive and thematic analysis techniques was employed to analyse the survey data, as well as transcribed responses from Question 14 of the survey and semi-structured interviews. These rigorous methods, along with measures such as triangulation and systematic coding, ensured the reliability and validity of both quantitative and qualitative data analysis in this study.

Results

The results of the study obtained from the survey entitled "Current State of Grant Writing Practices in Ukrainian Universities and Barriers to Successful Grant Writing" and semi-structured interviews on measures to be taken to bolster the capacity of Ukrainian universities to secure external funding for research showed that that researchers faced several challenges in grant proposal writing, which need to be addressed through institutional support and training programs to enhance their skills, language proficiency, and knowledge in grant writing techniques, and to provide them with access to funding opportunities and collaborations.

Current State of Grant Writing Practices in Ukrainian Universities Based on Results Obtained From the Survey

The results of the investigation, derived from the survey questionnaire focusing on the present state of grant writing practices in Ukrainian universities, encompassed the descriptive analysis findings from several specific questions, namely Questions 4, 5, 7, 8, 11, 12, and 13.

Table 2. Descriptive Statistics Drawn From Questions 4, 5, 7, 8, 11, 12, and 13 of the Survey Questionnaire

Question	Mean	SE	95% Confidence Interval		SD	Variance	Skewness		Shapiro-Wilk	
			Lower	Upper			Skewness	SE	W	*p*
Q4	1.83	0.0159	1.79	1.86	0.379	0.144	-1.72	0.102	0.631	< .001
Q5	1.32	0.0272	1.27	1.38	0.650	0.422	1.99	0.102	0.794	< .001
Q7	1.91	0.0123	1.88	1.93	0.293	0.080	-2.77	0.102	0.646	< .001
Q8	1.10	0.0139	1.08	1.13	0.333	0.111	3.30	0.102	0.704	< .001
Q11	2.56	0.0450	2.47	2.65	1.07	1.15	-0.372	0.102	0.764	< .001
Q12	1.63	0.0203	1.59	1.67	0.484	0.234	-0.528	0.102	0.712	< .001
Q13	2.44	0.0493	2.34	2.54	0.694	0.481	-0.841	0.173	0.828	< .001

The below outlined interpretation of the numerical statistics provided in Table 2 is combined with contextual information to enhance the understanding of the survey results.

In response to Question 4 (Q4), the mean score was 1.83 (SE = 0.0159, 95% CI: 1.79-1.86), with a standard deviation (SD) of 0.379, indicating moderate variability. The skewness value of -1.72 signified a negatively skewed distribution. The analysis of Google Forms data showed varied responses across roles and research areas, with Medical Sciences and Engineering/Social Sciences faculty exhibiting the highest frequency of grant proposal writers, while the Research role in Humanities had the lowest representation. Notably, 40.2% of participants reported submitting grant proposals for research and development funding, while 59.8% did not engage in this activity. This statistic is notable as it indicates that a significant portion of university faculty members in Ukraine are not actively engaged in grant writing activities. A possible interpretation of this finding could be that there might be various barriers or disincentives preventing a substantial number of researchers from seeking external funding. Further exploration is needed to uncover the underlying reasons.

For Question 5 (Q5), the mean score was 1.32 (SE = 0.0272, 95% CI: 1.27-1.38), with a higher SD of 0.650 compared to Q4, indicating increased variability in responses. The skewness value of 1.99 suggested a positively skewed distribution. Notably, 77.1% of respondents reported never engaging in grant proposal writing. This finding raises questions about the extent to which universities in Ukraine promote and support grant writing activities among their academic staff. It suggests that there may be room for institutions to encourage and provide resources for grant writing initiatives.

Regarding Question 7 (Q7), the mean score was 1.91 (SE = 0.0123, 95% CI: 1.88-1.93), and the SD was 0.293. The highly negatively skewed distribution was indicated by a skewness value of -2.77. Analysis revealed a mix of grant recipients (11.8%) and non-recipients (88.2%) among participants. This low percentage of grant recipients suggests that grant funding might not be easily accessible to Ukrainian university researchers. The potential implications are that either grant opportunities are limited or the application process is highly competitive. This warrants further investigation into the accessibility and transparency of grant programs in the country.

Concerning Question 8 (Q8), the mean score was 1.10 (SE = 0.0139, 95% CI: 1.08-1.13), and the SD was 0.333. A highly positively skewed distribution was observed with a skewness value of 3.30. The majority (91.9%) reported not receiving grants in the specified time period, while a small number (7.6%) received one or two grants, and a very small percentage (0.5%) received 3-4 grants in the past year. These results indicate a relatively low incidence of grant receipt, suggesting potential limitations or competitiveness in grant funding.

For Question 11 (Q11), the mean score was 2.56 (SE = 0.0450, 95% CI: 2.47-2.65), with an SD of 1.07. A slightly negatively skewed distribution was suggested by a skewness value of -0.372. Responses varied, with 33.80% indicating "Don't know/Not applicable," 1.10% "Strongly unsupportive," 27.20% "Somewhat unsupportive," 10.00% "Neutral," and 27.90% "Somewhat supportive." Strikingly, no responses were "Strongly supportive." These findings demonstrated a diverse range of perspectives regarding the grant writing culture within Ukrainian universities. The fact that a significant portion of respondents either lacked awareness or found the culture irrelevant raises questions about the extent to which universities promote a supportive environment for grant writing. The absence of strong support indicated a need for institutions to evaluate and enhance their efforts in fostering a grant-friendly culture.

Turning to Question 12 (Q12), the mean score was 1.63 (SE = 0.0203, 95% CI: 1.59-1.67), with an SD of 0.484, and a slightly negatively skewed distribution (skewness = -0.528). Approximately 34.60% reported participating in grant writing training, while the majority (65.40%) did not. This suggested that a substantial number of researchers may not possess the necessary skills and knowledge to write successful grant proposals. It highlighted the potential benefit of universities investing in training programs to equip their faculty members with essential grant writing competencies.

Finally, for Question 13 (Q13), the mean score was 2.44 (SE = 0.0493, 95% CI: 2.34-2.54), with an SD of 0.694, and a slightly negatively skewed distribution (skewness = -0.841). Notably, 29.70% viewed grant writing trainings as "not at all helpful," while 28.20% found them "not very helpful." Conversely, 39.60% considered the trainings "somewhat helpful," and a small fraction (2.50%) found them "very helpful." These diverse perceptions indicated that a significant proportion (29.7%) of respondents did not find grant writing training helpful. This raises concerns about the quality and

effectiveness of existing training programs. It is crucial for universities to assess and refine their training offerings to ensure they meet the needs and expectations of researchers.

The distribution of the responses of the surveyed people on questions 6, 9 and 10 are presented in Figures 4, 5 and 6.
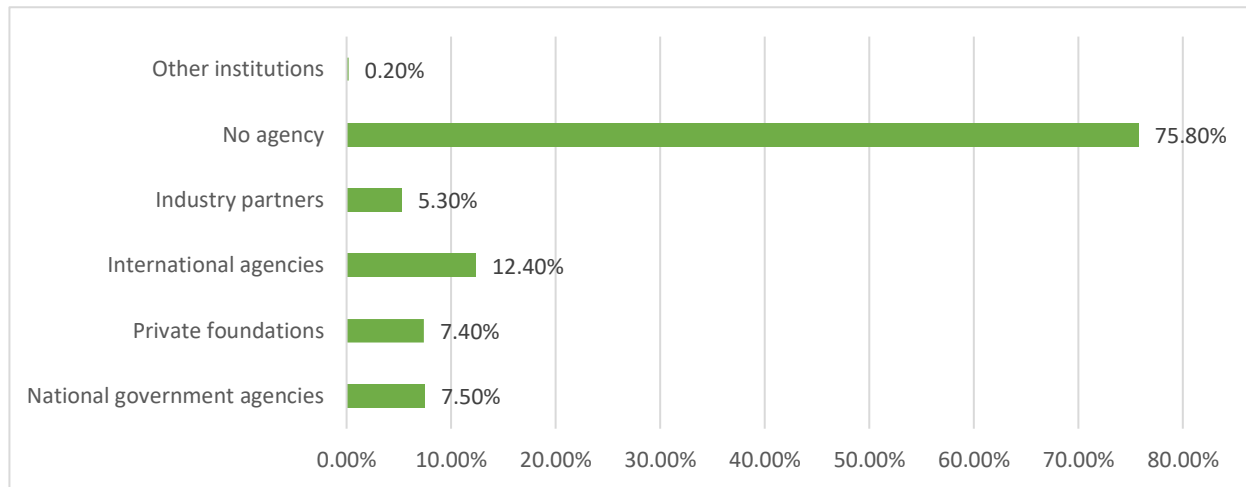

Figure 4. External Funding Agencies Applied to by Participants

In Figure 4, a significant majority (75.50%) of participants did not submit grant applications to external funding agencies, indicating limited proactive engagement. Among those who did apply, approximately 7.50% targeted national government agencies, 7.40% focused on private foundations, 12.40% sought opportunities with international agencies, and 5.30% explored collaborations with industry partners. Only a small minority (0.20%) pursued funding from alternative institutional sources like the Jean Monnet Fund, European Commission, U.S. Embassy, Embassy of Finland, and the University of Paris Dauphine. This data suggests that external funding agencies are not the primary source of funding for most researchers. Private foundations and international agencies were more frequently targeted. Further research is needed to understand the factors influencing researchers' decisions regarding external funding applications.
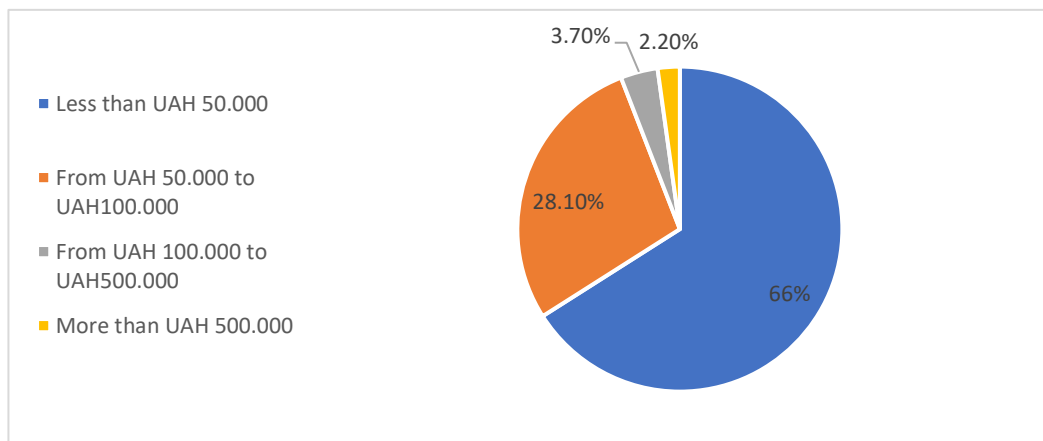

Figure 5. Funds Received Recently by the Surveyed Individuals to Conduct Their Research

In Figure 5, 66% of respondents received less than 50,000 Ukrainian Hryvnias (UAH), indicating smaller project budgets. About 28.10% received 50,000 to 100,000 UAH, signifying moderate funding. A minority (3.70%) received 100,000 to 500,000 UAH, suggesting larger projects. Only 2.20% received over 500,000 UAH, indicating limited access to substantial funds. Overall, most researchers had lower funding levels, with only a small fraction accessing higher amounts.

Key Impediments to Successful Grant Writing in Ukrainian Universities

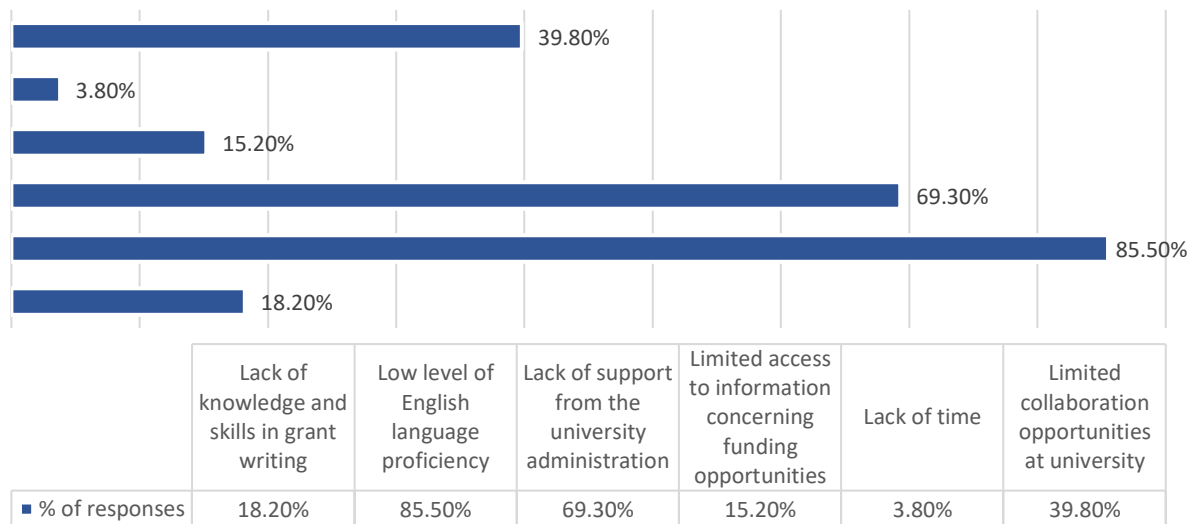Figure 6 outlined several key impediments to successful grant writing (see Figure 6).

% of responses	Lack of knowledge and skills in grant writing	Low level of English language proficiency	Lack of support from the university administration	Limited access to information concerning funding opportunities	Lack of time	Limited collaboration opportunities at university
% of responses	18.20%	85.50%	69.30%	15.20%	3.80%	39.80%

Figure 6. Challenges Faced by Researchers in Grant Proposal Writing

As can be seen in Figure 6, the most prevalent challenge, reported by 85.5% of respondents, was limited English language proficiency. This finding underscores the need for language support programmes to aid non-native English-speaking researchers in preparing competitive grant proposals. English proficiency showed to be crucial for international grant applications. The lack of support from university administration, cited by 69.3% of participants, appeared to be a critical issue. Universities play a critical role in facilitating grant application processes by providing resources, guidance, and administrative support. The high percentage of dissatisfaction in this area indicates a substantial gap that institutions need to address. The limitation of collaboration prospects (39.8%) highlights a potential barrier to successful grant writing. Collaborative research often attracts more significant funding opportunities. Universities should explore strategies to foster collaborative networks among their researchers to overcome this hurdle. The reported deficiency in knowledge and skills related to grant writing (18.2%) indicates a need for comprehensive training programs. This emphasised the importance of universities investing in skill development initiatives to enhance their researchers' grant writing capabilities. The challenge of limited access to information regarding funding opportunities (15.2%) suggests that universities should improve their communication channels to disseminate information about available grants and collaborations with external funding agencies.

Measures and Strategies to Strengthen the Grant Writing Capacity of Ukrainian Universities

The thematic analysis of suggestions to improve grant-writing practices in Ukrainian universities (Question 14) is presented in Table 3.

Table 3. Thematic Analysis of Suggestions to Improve Grant-Writing Practices in Ukrainian Universities

#	Theme	Description
1	Inclusion and Obligation	Inclusion of grant activities among the obligatory ones required for the contract performance
		Introducing the practice of mentoring to provide support in writing grant applications
		Introducing English-language courses specifically for writing grant applications
2	Training and Support	Conducting more trainings
		Creating a position at the University to provide support in writing and promoting grant applications
		Providing qualified support in writing and submitting grant applications is needed
3	Collaboration and Networking	Establishing and maintain contacts with representatives of foundations and programs at the institutional level
		Promoting collaboration on obtaining grants
		Cooperation in research and grant writing is needed
4	Motivation and Incentives	It is necessary to improve the motivation system and move away from the practice of leadership
		There is a need for a system of motivation
		There is a need for a transparent and fair system of incentives for writing and receiving grants
5	Language and Communication	Introducing English courses tailored to grant writing
		Improving language training of graduate students
		Ensuring publicity for scientists and optimise information on grants

Table 3. Continued

#	Theme	Description
6	Practical and Practicality	Replacing theoretical meetings on writing grant applications with practical ones
		Developing a methodology for writing grant proposals
		There is a lack of master classes on writing grant applications
7	Expertise and Support	Creating inter-university master classes on writing grant applications
		Need help of an experienced specialist in writing and supporting grant applications
		There is a need for editors of applications and those who will support them
8	Fairness and Transparency	Ensuring transparency and fairness in the distribution of grant funds.
		Grants are needed, but they should not be 'out of the blue.' There is the need for a system of incentives

The themes extracted from the data in Table 3 provide valuable insights into the perspectives of the respondents regarding grant-writing practices in Ukrainian universities. These insights extend beyond surface-level descriptions, offering a more analytical understanding of the findings: (a) institutionalisation - emphasising grant activities as obligatory for contracts suggests a drive to make grant writing a fundamental academic responsibility; (b) skills and language - calls for mentoring, English courses, and support positions reveal recognition of the need for skill development and language proficiency in securing grants; (c) resource challenges - the request for more training and support positions highlights researchers' challenges in grant writing and the need for expert guidance; (d) collaboration - recognition of collaboration and networking's importance reflects the interconnected nature of academia for obtaining grants; (e) motivation and equity - suggested changes to motivation systems and fair incentives indicate a desire for inclusivity and equity in grant writing; (f) communication - acknowledgment of language and communication challenges underscores the importance of transparent and accessible communication; (g) practical training - the preference for practical training signifies a need for hands-on tools and methodologies in grant writing; (h) expertise and support - demand for expert mentorship and editing highlights the need for experienced guidance; (i) fairness and transparency - the recurring theme of fairness and transparency underscores the importance of equitable resource allocation.

Results of the Study Obtained From Semi-Structured Interviews

The semi-structured interview revealed that the predominant participants in the study were Associate Professors affiliated with their respective institutions. Through the interview process, several additional areas emerged, shedding light on important insights and offering recommendations to enhance the grant-writing process within Ukrainian universities. The findings from these areas are presented in Table 4, providing a comprehensive overview of the key themes that emerged from the interviews and their corresponding descriptions.

Table 4. Themes Drawn From the Semi-Structured Interview

#	Theme	Description
1	Collaboration and Networking	Encourage interdisciplinary collaboration and partnerships to strengthen the quality and competitiveness of grants
2	Resources and Infrastructure	Provide access to research databases, facilities, and equipment to support high-quality research and grant proposals
3	Language Support	Implement the institutional language policy aimed at enhancing language proficiency and ensuring the quality of written submissions can increase the chances of success in securing external funding
4	Awareness of Funding	Disseminate information about domestic and international funding opportunities to researchers through a central platform
5	Institutional Support	This support is supposed to streamline the application process, provide expert advice, and alleviate administrative burdens, enabling researchers to focus on the content and quality of their proposals
6	Research Culture	Foster a culture of research excellence and recognise successful grant recipients through internal recognition programs
7	Internal Grant Review	Implement internal review processes with peer panels or mentorship programs to improve the quality of grant proposals
8	International Collaborations	Leveraging international partnerships to gain access to diverse expertise, resources, and funding opportunities, thereby increasing the potential for successful grant acquisition
9	Evaluation and Learning	Regularly evaluate funded projects to identify areas of improvement and contribute to a continuous learning process

The findings, as presented in Table 4, highlight key themes that emerged from the interviews, providing a comprehensive overview of the recommendations to improve grant-writing practices. The identified themes include the importance of collaboration and networking to strengthen the quality and competitiveness of grants, the provision of necessary resources and infrastructure such as access to research databases and facilities, the implementation of language support policies to enhance language proficiency and ensure high-quality written submissions, the dissemination of information about funding opportunities through a centralized platform, the need for institutional support to streamline the application process and provide expert advice, the fostering of a research culture that recognises excellence and success, the implementation of internal grant review processes with peer panels or mentorship programs, the leveraging of international collaborations to gain diverse expertise and funding opportunities, and the emphasis on evaluation and learning through regular project assessments. These findings directly address the question of bolstering the capacity of Ukrainian universities to secure external funding for research and development by providing specific recommendations in key areas of grant-writing improvement. Implementing these measures can enhance the overall grant-writing practices, increase the competitiveness of proposals, and ultimately improve the success rate of securing external funding in Ukrainian universities.

Discussion

This study aimed to examine the current state of grant writing practices in Ukrainian universities, identify the key obstacles that prevent successful grant writing within tertiary institutions from succeeding in grant writing, and offer measures and strategies to boost the grant writing capacity of Ukrainian universities. Descriptive and thematic analysis approaches, including triangulation of the data, were used to analyse the study's findings. The study's novelty lies in its investigation of the grant-writing process and the challenges that Ukrainian universities encounter in securing external funding for research and development. Furthermore, the study used primary data collection through surveys and semi-structured interviews, analysed interview data thematically, and focused specifically on grant-writing practices in Ukrainian universities. These features contribute to the advancement of knowledge in the field and offer practical insights for enhancing grant-writing processes in similar contexts.

Survey Findings Analysis

Engagement in Grant Proposal Writing (Q4 and Q5)

The survey data indicated that a significant portion of university faculty members in Ukraine were not actively engaged in grant writing activities. This finding raised questions about the existence of potential barriers or disincentives preventing many researchers from seeking external funding. The increased variability and positively skewed distribution in responses to Q5 suggest that while a substantial number of respondents reported never engaging in grant proposal writing, there is a moderate level of participation in grant writing activities among those who do. These results underscore the need for universities to promote and support grant writing initiatives among their academic staff actively.

Grant Receipt (Q7 and Q8)

The low percentage of grant recipients (11.8%) in the survey indicates that grant funding might not be easily accessible to Ukrainian university researchers. This raises questions about the accessibility and transparency of grant programs in the country. The positively skewed distribution in Q8 further emphasizes the relatively low incidence of grant receipt and suggests potential limitations or competitiveness in grant funding. These findings point to a need for universities and funding agencies to address barriers to grant receipt, potentially by streamlining application processes and providing clearer criteria for selection.

Grant Writing Culture (Q11)

The diverse range of perspectives regarding the grant writing culture within Ukrainian universities, as revealed in the survey, raises questions about the extent to which universities promote a supportive environment for grant writing. The absence of strong support for the grant writing culture suggests a need for institutions to evaluate and enhance their efforts in fostering a grant-friendly environment. This can involve providing more comprehensive support, resources, and recognition for grant writers.

Training and Perceived Helpfulness (Q12 and Q13)

The survey results indicate that a substantial number of researchers may not possess the necessary skills and knowledge to write successful grant proposals. This highlights the need for universities to invest in training programs to equip their faculty members with essential grant writing competencies. The diverse perceptions of the helpfulness of grant writing training programs underline the importance of universities assessing and refining their training offerings to better meet the needs and expectations of researchers.

Comparing Survey Findings with Interview Themes

The study found that the survey findings and interview themes complemented each other, offering a comprehensive view of grant-writing practices in Ukrainian universities.

Language and Skills: Both the survey and interviews highlight the critical role of language proficiency and skills in grant writing. The survey reveals concerns about limited engagement and training, while interviews stress the need for language support policies and skill development programs.

Collaboration and Networking: Survey data emphasize the value of collaboration, with respondents recognising its importance in obtaining grants. Interviews echo this theme, emphasizing the need to strengthen collaborations and networking for better grant competitiveness.

Resources and Infrastructure: Interviews emphasise the necessity of resources like research databases and facilities, echoing the survey's indication of potential barriers related to resources.

Communication and Information: Both data sources stress the importance of transparent and accessible communication about funding opportunities. Interviews suggest a centralized platform for information dissemination, aligning with survey responses.

Expertise and Support: Both the survey and interviews highlight the demand for expert guidance and support in grant writing. Survey respondents express a need for training and qualified support, while interviews suggest mentorship programs and internal grant review processes.

Motivation and Equity: The survey raises questions about motivation and equity in grant writing. Interviews recommend changes to motivation systems and fair incentives, addressing these concerns.

Research Culture: Interviews underscore the importance of fostering a research culture that recognizes excellence, which aligns with the survey's findings on attitudes toward the grant writing culture.

International Collaborations: Interviews emphasise leveraging international collaborations, mirroring the survey's findings regarding international grant applications.

Evaluation and Learning: Both data sources emphasise the importance of evaluation and learning through regular project assessments, with interviews suggesting peer panels and mentorship programs.

Implications and Significance

The findings collectively point to several implications for Ukrainian universities:

- Language Support: Addressing language barriers and enhancing English proficiency is crucial to enable researchers to compete for international grants.

- Resource Allocation: Ensuring adequate resources and infrastructure is vital to eliminate barriers to grant writing.

- Information Dissemination: Universities should improve communication channels to inform researchers about funding opportunities.

- Expertise and Training: Investment in training programs and expert support can enhance researchers' grant writing capabilities.

- Collaboration and Networking: Encouraging collaborations and networking can boost grant competitiveness.

- Motivation and Equity: Institutions should review motivation systems and incentives to promote equity in grant writing.

- Research Culture: Fostering a supportive research culture can encourage grant proposal submissions.

- International Engagement: Exploring international collaborations can expand access to diverse expertise and funding opportunities.

- Evaluation and Learning: Implementing evaluation mechanisms and learning initiatives can improve grant writing practices over time.

The findings and themes discussed above align with several literature sources. These go in line with Rusu et al. (2022) along with Wiebe and Maticka-Tyndale (2017) who identified the determining factors for the researcher's participation and success rates in research funding competitions and discussed various strategies and best practices for improving grant-writing skills, fostering collaboration, and providing institutional support. This study findings are consistent with Shamsi and Osam (2022) who focus on the importance of language support for non-native English-speaking researchers. It discusses the challenges they face in grant writing and provides recommendations for institutions to enhance language proficiency and support researchers in improving their written submissions. This study contributes to the discussion of

fostering a research culture within universities and its impact on grant-writing practices which was found in De Peuter and Conix (2021). The above study discusses strategies, policies and actions to be taken for creating an environment that recognises and rewards research excellence, motivating researchers to actively pursue funding opportunities. The findings drawn from this research go in line with Gallo et al. (2021) who highlights the benefits of peer panels and mentorship programs in improving the quality of grant proposals and increasing the likelihood of securing external funding. This study is consistent with Barrett et al. (2011), Huang (2014) and Yao (2021) who discussed the benefits of partnering with international institutions and the impact on grant-writing practices, including access to funding sources and broader research networks.

Conclusions

Based on the findings of this study, several noteworthy conclusions can be derived: firstly, it is evident that a substantial portion of university faculty members in Ukraine are not actively engaged in grant writing activities. These findings underscore the urgent need for universities to take proactive measures in promoting and supporting grant writing initiatives among their academic staff. Secondly, the study reveals a low percentage of grant recipients, highlighting the infrequent acquisition of grants. This suggests potential limitations or competitiveness within the grant funding landscape. Addressing these barriers may require efforts to streamline application processes and provide greater clarity in the selection criteria. Thirdly, the research identifies a lack of robust support for the development of a grant writing culture within Ukrainian universities. This finding signals the importance of institutions critically evaluating and enhancing their efforts to create an environment that encourages and recognizes grant writing endeavours. This can include providing comprehensive support, allocating necessary resources, and acknowledging the contributions of grant writers. Fourthly, the study highlights a significant deficit in the essential skills and knowledge required for crafting successful grant proposals among a substantial number of researchers. This underscores the critical need for universities to continually assess and refine their training offerings to better cater to the evolving needs and expectations of researchers. Furthermore, the study demonstrates that the survey findings and interview themes mutually reinforce one another, providing a comprehensive view of grant-writing practices in Ukrainian universities. These key areas of alignment encompass the critical role of language proficiency and skills in grant writing, the undeniable value of collaboration in securing grants, the necessity of adequate resources, the importance of transparent and accessible communication regarding funding opportunities, the clear demand for expert guidance and support in grant writing, the imperative need for revisions in motivation systems and equitable incentives, the significance of fostering a supportive research culture, the potential benefits of leveraging international collaborations, and the paramount importance of implementing evaluation and learning mechanisms through regular project assessments. For future research, it is advisable to delve deeper into the specific types of training programs attended by researchers, assess the perceived effectiveness of these training initiatives, and investigate their tangible impact on grant writing outcomes. Such investigations would provide valuable insights for the development and implementation of effective and tailored grant writing training programmes.

Recommendations

Based on the study's findings, a set of recommendations has been formulated for university administrators, researchers, policymakers, and funding agencies in Ukraine, as outlined below:

Recommendations for University Administrators:

Promote Grant Writing Initiatives: University administrators should take proactive steps to promote and support grant writing initiatives within their institutions. This includes creating awareness among faculty members about the importance of grant writing and the resources available for training and support.

Enhance Language Support: Recognising the significance of language proficiency, universities should invest in language support programs to assist non-native English-speaking researchers. Improving English proficiency can enhance their competitiveness in securing international grants.

Allocate Adequate Resources: Ensure that universities allocate sufficient resources, including access to research databases and facilities, to eliminate barriers to grant writing. Adequate infrastructure is essential for researchers to engage effectively in grant-related activities.

Foster a Supportive Research Culture: Create an environment that recognises and rewards research excellence. This includes acknowledging the contributions of grant writers and providing them with the necessary support and recognition.

Evaluate Motivation Systems: Administrators should review existing motivation systems and incentives to promote equity in grant writing. Fair and transparent incentives can motivate researchers to actively pursue funding opportunities.

Recommendations for Researchers:

Engage in Grant Writing Activities: Researchers should consider actively engaging in grant writing activities to access external funding opportunities. Despite potential challenges, participation in grant writing can enhance research prospects.

Seek Training and Support: Researchers who lack essential grant writing skills should proactively seek training programs and expert guidance. Universities often offer such resources, and researchers should take advantage of them to improve their grant writing competencies.

Collaborate and Network: Recognise the value of collaboration and networking in obtaining grants. Actively seek opportunities to collaborate with peers, both nationally and internationally, to enhance grant competitiveness.

Stay Informed: Stay informed about funding opportunities by regularly checking communication channels provided by the university. Universities should improve information dissemination to ensure researchers are aware of available grants.

Participate in Evaluation and Learning: Researchers should actively engage in project assessments and peer panels, where applicable. These processes can improve grant writing practices over time and increase the likelihood of success.

Recommendations for Policymakers and Funding Agencies:

Streamline Application Processes: Policymakers and funding agencies should work toward streamlining application processes and providing clearer selection criteria. This can make grant programs more accessible and reduce potential barriers.

Support Language Initiatives: Recognise the importance of language proficiency and support initiatives that enhance researchers' English language skills. This support can enable researchers to compete more effectively for international grants.

Encourage Collaboration: Policymakers can encourage collaboration among researchers and institutions by providing incentives for collaborative projects. Such collaborations can attract larger funding opportunities.

Transparent Communication: Ensure transparent and accessible communication about funding opportunities. Establish centralised platforms for information dissemination to make it easier for researchers to access information.

Evaluate and Adapt Programmes: Regularly evaluate the effectiveness of grant-related programs and initiatives. Policymakers should be open to adapting these programs based on feedback and changing needs within the research community.

Limitations

This study has several limitations. Firstly, relying on self-reported survey data introduces the possibility of reporting bias and subjective interpretations. Independent verification is necessary for data accuracy. Secondly, the sample size and composition may restrict generalizability to the wider academic community. A larger and more diverse sample would improve understanding across different contexts. Another limitation is the retrospective data collection, which can be influenced by memory biases. Longitudinal or real-time data collection methods would provide more reliable insights. Lastly, the study focused on Ukrainian universities, limiting its applicability to other settings.

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Authorship Contribution Statement

Shykhnenko: Developed the research concept, designed the questionnaire for the field phase survey, collected and consolidated data, collected data, made data analysis and statistical analysis, revised the instruments, wrote the first draft of the paper. Sbruieva: Provided supervision, revised the first draft of the paper, proofread the drafts, edited and reviewed them, consolidated data, provided interpretation.

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Appendices

Appendix A. Survey Questionnaire Entitled "Current State of Grant Writing Practices in Ukrainian Universities and Barriers to Successful Grant Writing" (The Ukrainian version of this questionnaire is available via the link: http://bitly.ws/EkdA)

Section 1: Demographic Information

1. What is your current position at the university? (Tick one)

Faculty position:

☐ a. Professor

☐ b. Associate Professor

☐ c. Assistant Professor

☐ d. Lecturer

Research position:

☐ e. Postdoctoral researcher

Student and research position:

☐ f. PhD student

☐ g. Other (please specify) _____

2. What is your area of research expertise? (Tick all that apply)

☐ a. Natural sciences

☐ b. Social sciences

☐ c. Humanities

☐ d. Engineering

☐ e. Medical sciences

☐ f. Other (please specify) _____

3. Which Ukrainian university are you affiliated with? (Write the name of the university)
_____

Section 2: Grant Writing Practices

4. Have you ever written a grant proposal for external funding for research and development? (Tick one)

☐ a. Yes (1)

☐ b. No (2)

If yes, please answer the following questions. If not, please skip to Section 3.

5. How often do you write grant proposals for external funding for research and development? (Tick one)

☐ a. Never (1)

☐ b. Rarely (2)

☐ c. Occasionally (3)

☐ d. Frequently (4)

6. Which external funding agencies have you applied for grants to in the past? (Tick all that apply)

☐ a. National government agencies

☐ b. International organisations

☐ c. Private foundations

☐ d. Industry partners

☐ e. Other (please specify) _____

7. Have you received any grants for research and development in the past? (Tick one)

☐ a. Yes (1)

☐ b. No (2)

If yes, please answer the following questions. If not, please skip to Section 3.

8. How many grants have you received for research and development in the past year? (Tick one)

☐ a. None (1)

☐ b. 1-2 (2)

☐ c. 3-4 (3)

☐ d. 5 or more (4)

9. How much funding did you receive for your most recent grant? (Tick one)

☐ a. Less than UAH 50,000

☐ b. UAH 50,000 - UAH 100,000

☐ c. UAH 100,000 - UAH 500,000

☐ d. More than UAH 500,000

Section 3: Barriers to Successful Grant Writing

10. What are the biggest challenges you face when writing grant proposals for external funding for research and development? (Tick all that apply)

☐ a. Lack of knowledge and skills in grant writing

☐ b. Lack of time to write grant proposals

☐ c. Limited access to information concerning funding opportunities

☐ d. Lack of support from the university administration

☐ e. Limited collaboration opportunities at university

☐ f. Low level of English language proficiency

☐ g. Other (please specify) _____

11. What is the current grant writing culture like in your university?

☐ a. Don't know/Not applicable (1)

☐ b. Strongly unsupportive (2)

☐ c. Somewhat unsupportive (3)

☐ d. Neutral (4)

☐ e. Somewhat supportive (5)

☐ f. Strongly supportive (6)

12. Have you ever attended any training on grant writing? (Tick one)

☐ a. Yes (1)

☐ b. No (2)

If yes, please answer the following questions. If not, please skip to Section 4.

13. How helpful were the training or workshops in improving your grant writing skills? (Tick one)

☐ a. Not at all helpful (1)

☐ b. Not very helpful (2)

☐ c. Somewhat helpful (3)

☐ d. Very helpful (4)

Section 4: General Feedback

14. Do you have any additional comments or suggestions on how Ukrainian universities can improve their grant-writing practices? (Write your response) _____

<div align="center">Thank you for participating in this survey. Your input is greatly appreciated!</div>

Appendix B. Semi-structured Interview Questionnaire on Measures to be Taken to Bolster the Capacity of Ukrainian Universities to Secure External Funding for Research

1. Can you briefly introduce yourself and your role in the university?

2. In your opinion, what are the biggest challenges Ukrainian universities face when it comes to securing external funding for research and development?

3. How does your university currently go about identifying and applying for external funding opportunities for research and development?

4. Are there any best practices or success stories at your university or in other universities in Ukraine that you think should be replicated to increase the success rate of grant applications?

5. How important is collaboration with other universities and research institutions in securing external funding for research and development? How does your university approach collaborations?

6. What role can the government play in bolstering the capacity of Ukrainian universities to secure external funding for research and development?

7. How does your university currently support researchers in writing successful grant proposals? Are there any areas for improvement?

8. In your opinion, how can Ukrainian universities improve their visibility and reputation in the international academic community, and how can this contribute to securing external funding for research and development?

9. Are there any particular areas of research that your university is currently prioritising, and how is this reflected in its external funding applications?

Looking ahead, what measures do you think Ukrainian universities should take to increase their capacity to secure external funding for research and development in the coming years?