Faculty Views on the Barriers and Facilitators to Grant Activities in the USA: A Systematic Literature Review

Rachel A. Goff-Albritton, PhD., CCC-SLP
Florida State University

Philip A. Cola, PhD
Case Western Reserve University

Jennifer Walker
Florida State University

Judy Pierre
Florida State University

Sandhya D. Yerra
Florida State University

Isabella Garcia
Florida State University

Abstract: *Research development in higher education is a service-delivery system. In any service field, when choosing appropriate services, practitioners should reach for 'evidence-based practices.' Limited empirical research has addressed the preferences of research faculty regarding research support services. In this project, we sought to provide research development professionals with critical knowledge related to decision making and strategic utilization of resources and in choosing client-centered grant-related services for faculty. The specific research question or objective of this study was to answer, "What factors are perceived by faculty to be barriers or facilitators to grants activity based on extant literature?" This systematic literature review on faculty perceptions of barriers and facilitators to grant activity used an eight-step systematic literature review methodology. The findings describe the characteristics, methodological attributes, and the methodological quality of the articles. Additionally, the integration of the findings revealed eight main factors that faculty perceived to be important for facilitating or hindering grant activity. Three main emerging factors or core categories appeared to be most important across all barriers or facilitators to faculty grant activity. Research development professionals need to be able to provide evidence-based and client-centered research support services. This review provides the factors that faculty view as being most important to grant activity and recommendations for management. Implementing effective client-centered research support services is critical for the success of faculty grant activity.*

Keywords: *grants, funding, faculty, evidence-based practice, systematic literature review, research development*

Introduction

Grants and contracts are critical sources of university income. Public universities in the U.S. received 22% of university operating revenues from grants and contracts in 2016-2017 (U.S. Department of Education, 2018), which is an increase from 13% in the 1980s (Daniel & Gallaher, 1990). Many universities, colleges, and departments now require faculty to write grant proposals especially if faculty are on a tenure track. The majority of advertisements for faculty positions list "grant proposal writing" as a position requirement (Kleinfelder et al., 2003). The current workload expectations and requirements of research faculty have increased, and they must effectively balance service or clinical practice, teaching, and research, including, in many cases, grant proposal writing (Cola & Wang, 2017; Whicker et al., 1993). In fact, many universities, colleges, and departments require that faculty not only submit grants, but faculty must also be awarded grants at various levels to be realistically considered for promotion and tenure (Boardman & Ponomariov, 2009).

Faculty have varying levels of experience with *grant activities* (i.e., grant seeking, grant writing, grant submission, and grant management). Some faculty have never written a grant in the past, others may have had only one grant-writing course or seminar in graduate school. Other faculty have received grants to support their graduate studies or worked on a funded project while matriculating towards their degrees (Etzkowitz, 1990). Some faculty must have funding in order to complete their research. In contrast, others may be able to conduct research without funding and instead use grants to promote the validity of their work, enhance their reputation, or provide additional resources (Oakleaf, 2010). Some faculty enjoy the scholarly act of writing grants or prioritize grant seeking within their career goals, while others do not (Dooley, 1995; Easterly & Pemberton, 2008; Monahan, 1993; Pinto & Huizinga, 2018). Regardless of the faculty member's level of experience with grants, reliance on grants, or general interest in grant seeking, a critical role of research development professionals in higher education is to assist faculty with all facets of research and grant activities, which is a critical aspect to conducting more research and gaining tenure (Decker et al., 2007; Wimsatt et al., 2009).

Research development (RD) in higher education is a service-delivery system (Cole, 2010). RD includes strategic advancement of institutional research, communication of research and opportunities, enhancement of collaborations, and research proposal development (National Organization for Research Development Professionals [NORDP], 2019). In this service-delivery system, research development professionals, which going forward we will refer to as RDPs, serve as 'practitioners' with faculty as their 'clients.' RDPs can include any research administrators, research-related staff, research managers, research deans, department chairs, or other upper administrators, and for this paper's purposes, when we use the title 'faculty' we are referring to those required to conduct research as part of their job position or role.

In any service field, when choosing appropriate services, practitioners should reach for *evidence-based practices* (Rousseau, 2006). The term *evidence-based practice* refers to an approach in which current, high-quality research evidence is integrated with practitioner expertise and client preferences and values to aid in decision-making for provided services (American Speech-Language-Hearing Association [ASHA], 2005). The three key components of an evidence-based RD service-delivery system include: 1) the knowledge and abilities of RDPs (practitioner expertise); 2) the academic literature on effective research support services (current best evidence); and 3) faculty preferences for provided research-support services and organizational support systems (client-centered).

Limited empirical research has addressed the preferences of research faculty concerning research support services. It is critical to understand faculty preferences of support services offered, because the initial reaction is often that they are losing autonomy or that there is an attempt to increase their regulatory burden (Rockwell, 2009). The client-centered practice of providing research support services in higher education is an attempt to reduce the administrative and regulatory burden on investigators seeking sponsored research, while helping them navigate numerous indirect research activities and requirements (e.g., complying with institutional rules or navigating institutional resources), that often fall outside the scope of their research (Decker et al., 2007; Wimsatt et al., 2009).

To support our pursuit of evidence-based practice in RD, we conducted a systematic literature review of faculty perceptions on grant-related research support services and organizational support systems. In this project, we sought to provide RDPs with critical knowledge related to decision making and strategic utilization of resources and in choosing client-centered grant-related services for faculty. The specific research question, or objective of this study, was to answer, "What factors are perceived by faculty to be barriers or facilitators to grant activities based on extant literature?".

Method

This systematic literature review on faculty perceptions of barriers and facilitators to grant activities was conducted using an eight-step systematic literature review approach (Dollaghan, 2007; Gough et al., 2017; see Figure 1). Articles included in this review included faculty researchers from United States (U.S.) institutions. These articles reported on barriers and facilitators to faculty grant activities (excluding articles solely focused on teaching, curriculum, or academic programs, for example). The included articles explored faculty views (i.e., attitudes, beliefs, perceptions of experiences) and used qualitative methods, such as surveys or interviews, to directly report faculty views, instead of having the investigator describe faculty views. Articles that were not peer reviewed or written in English were excluded. Articles reporting on universities outside of the U.S. or published before 1990 were excluded to better reflect current federal funding trends and institutional cultures in the United States.

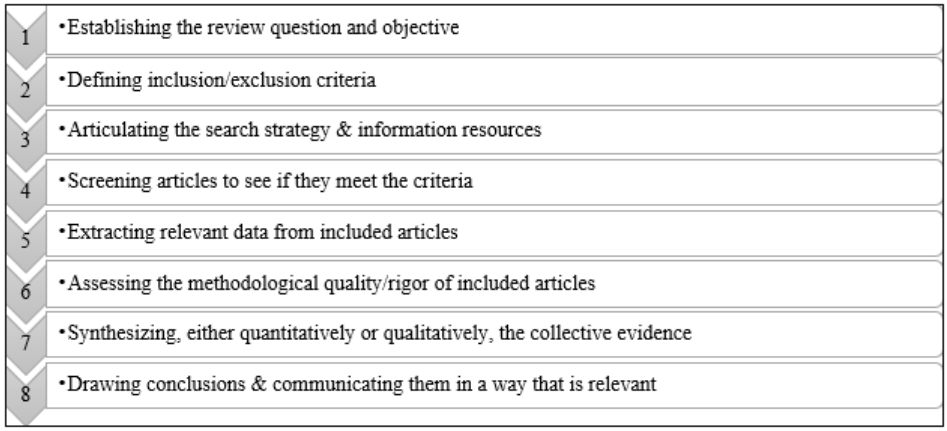


Figure 1. Steps to the Systematic Literature Review

The systematic search, as depicted in Figure 2, used the following Boolean combinations: faculty AND grants, faculty AND perceptions, and faculty AND views. A university librarian was consulted for databases and journals most relevant to this research topic. The databases searched were ERIC (Proquest) (n=2,911), Social Sciences Premium (Proquest) in the *Journal of Faculty Development* (n=36) and *Research in Higher Education* (n=88), and Academic OneFile in the *Journal of the Society of Research Administration* (JSRA) (n=8) and the *Journal of Research Administration* (formally JSRA) (n=13). All results were imported into a citation manager (Ref Works) and filtered for duplicates (n = 104).

Figure 2. Search Flowchart: Total of 13 Included Articles in Current Review

Click here for larger image

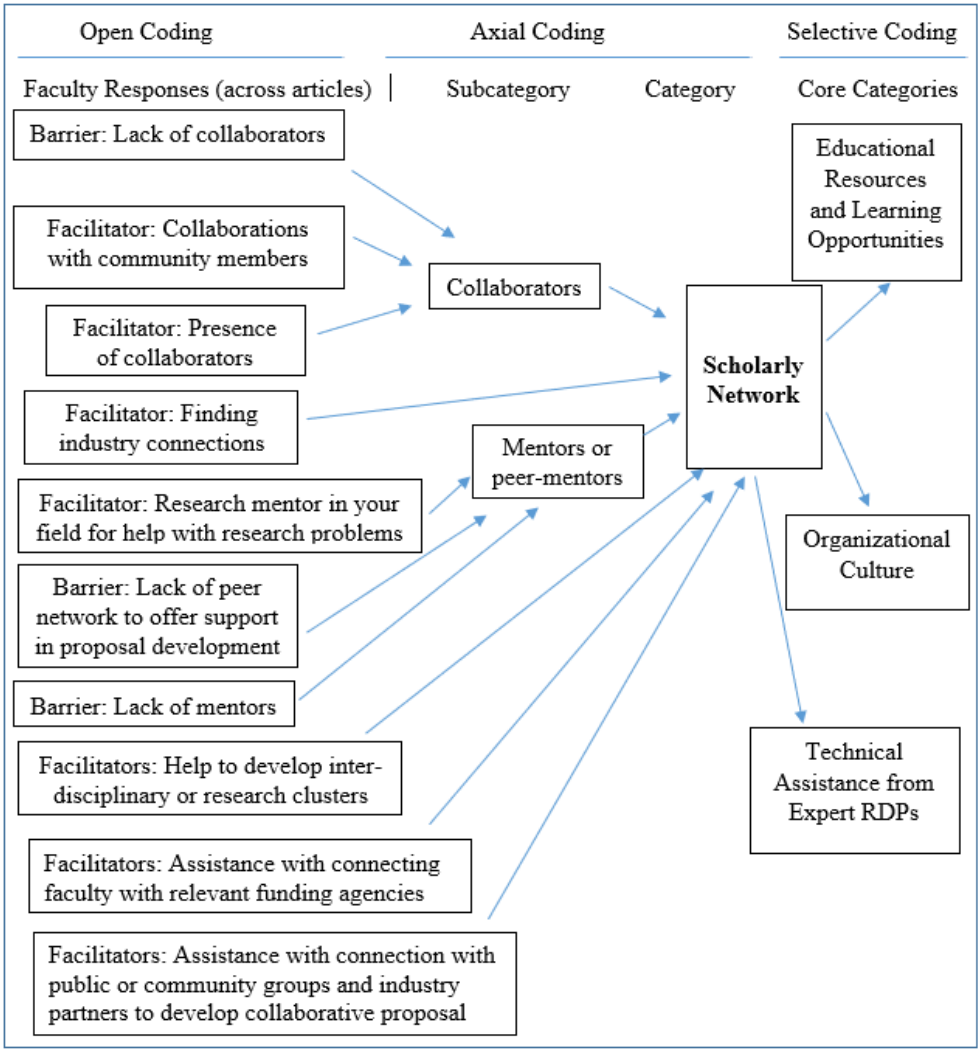
The systematic search across select databases and journals resulted in a total of 3,059 raw hits with 2,955 remaining after removal of duplicates. In the first level of screening, three authors served as reviewers (JP, SY, and IG) to screen the title and abstract of each of these papers for the stated inclusion criteria. This first level of screening eliminated 2,793 articles. Two authors (RG & JP) independently reviewed the full text of the remaining articles (n=162) using the inclusion criteria and excluded an additional 156 articles. Nine articles remained for review.

Additionally, the table of contents, titles, and papers within the *Journal of the Grants Professionals Association* and *NCURA Research Management Review* (n=328) were hand-searched by two reviewers (RG & IG), and two additional articles were found to be relevant. These two articles were added for a total of 11. Leaders in the field, including the president of Sponsored Research Administration International, the president of the National Organization of Research Development Professionals, and the president of the National Council of University Research Administration, were consulted for relevant, potentially missing articles, however, no additional articles meeting inclusion criteria were discovered from these consultations. An additional two articles were added that were found from the extant literature (i.e., cited within included articles) that met inclusion criteria. After completion of the systematic search, a total of 13 articles were retained for the final review, data extraction, quality assessment, and synthesis..

Data Extraction and Analysis

Characteristics of each included article (i.e., the aim, faculty sample, university characteristics, sample size, response rate, sampling method, data collection, and data analysis) were extracted and compiled into data tables. The findings (barriers and facilitators) from each article were copied and pasted into individual Microsoft Word documents and exported into NVivo software for coding and data analysis. For survey data, findings reported by at least 50% of the respondents were extracted. For qualitative interview data within the included articles, any barriers or facilitators reported by participants or by the corresponding author of the article that were used to describe emerging main findings or "themes," were extracted.

The data analysis was conducted in three overlapping stages, including 'open coding,' 'axial coding,' and 'selective coding' (Charmaz, 2014; Creswell & Creswell, 2017; Saldaña, 2012). The findings from each article were examined line-by-line by one author (RG), and open (free) codes were inductively created to capture the meaning of the data ('open coding'). Free codes are non-hierarchical, not bound by the research question, and allow for emergent themes to arise organically out of the data (Creswell & Creswell, 2017). Most often, the exact wording from the survey or the participants became the open code, and these codes were recorded under headings of either a facilitator or a barrier. When all responses had been examined multiple times to ensure all results were recorded, two reviewers (RG and PC) grouped similar codes into subcategories and categories to create higher-order codes ('axial coding'). Axial coding is a way of grouping similar codes into a smaller number of concepts, which are inferential or explanatory and identify a "bigger picture" (like cluster- or factor-analysis in quantitative analysis) (Saldaña, 2012). Figure 3 provides an example of open and axial coding. With the goal of supporting open data, our codes have been made publicly available for other researchers in the Open Science Framework (https://osf.io/qp4bs/).



Note. The data analysis was conducted in three overlapping stages, including 'open coding,' 'axial coding,' and 'selective coding' (Charmaz, 2014; Creswell & Creswell, 2017; Saldaña, 2012)

Figure 3. Example of Open, Axial, and Selective Coding Leading To the Development of the Category of 'Scholarly Network'

Every finding was categorized within at least one axial code, with several findings categorized into more than one axial code (e.g., "poor interdepartmental communication with not enough knowledge about grant activities in other departments and within their own departments" went into both 'scholarly climate' and 'scholarly network' axial codes). Due to the small sample of relevant articles and because many of the articles included fixed-response questionnaires, the number of facilitators versus barriers (e.g., more facilitators found across studies than barriers) did not provide any indication as to whether faculty in general perceive more facilitators than barriers in grant activities. We initially planned to further refine these categories during axial coding according to our research question regarding barriers to and facilitators of grant activities, but we found that many barriers also served as facilitators (e.g., 'not having internal funding for travel' and 'having internal funding for travel'). Therefore, the findings were combined, without differentiation of barriers and facilitators, at the axial coding stage. Finally, two reviewers (RG and PC) independently further categorized the axial codes by highlighting emerging findings or categories across axial codes ('selective coding' or finding core categories that explain and summarize axial codes) and then considered the implications of the faculty views for service-delivery recommendations.

Methodological Quality Assessment

We then appraised each of the articles independently for methodological quality by two reviewers (RG and PC). Methodological quality was assessed using a modified set of criteria (Goff-Albritton & Cola, 2021) from previous reviews conducted by the UK's Department of Health and Social Care (DHSC) Policy Reviews Facility (Rees et al., 2009; Shepherd et al., 2010) and informed by principles of good practice for conducting social research with the public (Harden et al., 2004), as adapted from Lester et al. (2019). The quality of each study was rated according to:

- the rigor of sampling, data collection and data analysis;
- whether study findings were grounded in/supported by data;
- whether the breadth and depth of findings were appropriate for the review;
- whether young people's perspectives and experiences were privileged.

For example, if the sampling method was appropriate to the questions posed, attempts were made to obtain a diverse sample, and the characteristics of the sample were thoroughly described, the rigor of sampling would receive full credit or a rating of 3.

Finally, points were assigned to each of these ratings and totaled for an Overall Methodological Quality Rating (see Online Resource 1 - https://osf.io/qp4bs/). This rating provided the weight (low, medium, high) for the perceived trustworthiness of each article's findings (i.e., the extent to which the methods employed were rigorous and would minimize bias and error in the findings). Initial inter-rater agreement was 77% across rating criteria for these 13 articles and 92% for the Overall Methodological Quality Rating of the relevance of the articles (i.e., high, medium, and low). This indicates substantial and nearly perfect agreement between reviewers (RG and PC), respectively. Discrepancies were discussed between the two reviewers until agreement on the methodological quality ratings were achieved.

Results

This analysis of 13 articles resulted in findings on the views of research faculty members of what facilitates and what serves as barriers for their grant activities. The results describe the:

- **Characteristics** of the articles (e.g., the faculty members and institutions studied);
- **Methodological attributes** of the articles;
- **Methodological quality** of the articles; and
- **Synthesis of the findings** of the reported barriers and facilitators.

After analyzing the sample publications, the authors sense that faculty and RDPs will likely derive the most benefit from these findings on individual studies, the summary of findings, and the provided recommendations. Whereas researchers (i.e., those interested in furthering and studying the field of research development and research management) will likely find useful information in the provided characteristics and methodological attributes of the reviewed articles, which highlight areas in which future research seeking faculty perspectives could be better supported or improved.

Characteristics of Included Articles

Detailed characteristics of the included articles are provided in Table 1. Aims across studies were generally to study the barriers and facilitators of grant activities as perceived by faculty. A total of 1,593 faculty members were included across this sample of articles. Several articles focused on a specific population (i.e., African American faculty, female faculty, senior faculty, junior faculty, and faculty with diverse levels of experience in grant activities). College of education faculty were a focus of four articles. Health education faculty members were the focus of one article. Several articles focused on similar types of institutions. Four articles included Research 1 institutions or institutions with significant grant activity. Two articles described findings from predominately undergraduate institutions. Four articles reported responses from faculty across multiple institutions.

Although some of the included articles provided analyses of differences across groups (e.g., the difference in importance of collaborators as a facilitator for grant activities for tenured vs. non-tenured faculty), this information or these characteristics were not present or consistent across all studies; moreover, the heterogeneity of the characteristics within the included articles prevents any valid attempts to provide meaningful analysis of group differences in the current review. Also, efforts were undertaken to examine if the integrated findings could be attributed to a particular faculty or university characteristic or to the methodological quality of the primary research; however, no category appeared to contribute to a specific characteristic and no study methodological quality rating appeared to contribute more or less to the integrated findings.

Table 1. Overview: Aims, Sample Characteristics, and University Type

Article	Aim	Faculty Sample	University Type
Belgrave, Moore, & Douglas-Glenn (2019)	To identify these barriers and factors that are unique to African American faculty and to identify how these barriers might be attenuated by protective factors or assets	16 African American faculty described by career levels, academic disciplines, and gender, mostly women (purposeful sampling)	A research-intensive university in the mid-Atlantic
Boyer & Cockriel (1998)	To examine in greater detail the factors that are barriers or facilitators to pursuing grants for both tenured and non-tenured faculty	248 male and female College of Education faculty across career levels, mostly tenured	Research I institutions that were part of the Association of American Universities
Boyer & Cockriel (2001)	To examine motivating and hindering factors of junior faculty across disciplines at a research university in their pursuit of grant proposals	137 junior faculty, not yet tenured, across academic disciplines (other than College of Education due to the author's affiliation)	A Midwestern research university
Cole (2007)	To provide recommendations from a faculty perspective for how to improve the system of research administration and faculty relationships	32 senior faculty from major research universities	Major research universities (i.e., universities receiving at least 1 million in federal funding)
Daniel & Gallaher (1990)	To determine some of the barriers that impede faculty members' involvement in grant activities	15 full-time tenure track College of Education faculty across 4 departments with half having little to no experience with grants (convenience sample)	University of New Orleans College of Education
Dooley (1995)	To change its research culture to encourage more faculty grant seeking by surveying their faculty on barriers and facilitators and frequency of use of support services	58 College of Education tenure-track Faculty at Texas A & M University (also made comparisons of the sample to the population based on gender, career-level, and distribution of teaching experience and academic discipline)	Texas A&M University, which was ranked eighth among the nation's research universities by the National Science Foundation
Easterly & Pemberton (2008)	To examine the barriers and supports perceived by female associate professors to help female associate professors increase the number of proposals they write, and in turn, possibly increase their chances of achieving promotion	133 Female faculty across career levels, academic disciplines, experience with grants, and amount of support with home management	Three state universities in Idaho (i.e., Boise State University, Idaho State University, and University of Idaho)

Article	Aim	Faculty Sample	University Type
Kleinfelder, Price, & Dake (2003)	To identify barriers and incentives to grant writing, exploring the level of faculty grant activity and determine grant writing preparation in graduate health education programs	282 Health Education faculty members across career-levels	Institutions offering undergraduate and graduate degree programs in Health Education
Monahan (1993)	To compare the barriers and facilitators to grant activities for their faculty to those reported by faculty in other "views" studies in prior literature	136 faculty described by career levels, academic disciplines, and experience with grants (systematic random selection)	Eight campus-based state predominately undergraduate institutions in New Jersey
Mullen, Murthy, & Teague (2008)	To provide a vehicle for faculty input in the University's strategic planning process and assess the degree of importance faculty placed on several resources required to support research and scholarship	305 research administrators and university faculty across career-levels and academic colleges	University of South Florida, a research-extensive institution in the southeastern U.S., classified as a Carnegie research-extensive, doctoral-granting, public institution
Pinto & Huizinga, 2018	To determine how faculty maintain research productivity in external grant seeking and the impact of institutional support and leadership	15 faculty described by their different career levels, gender, racial/ethnic groups, experience with grants, academic colleges, and years at the university (purposeful sampling)	A predominantly undergraduate institution and a Hispanic-Serving and Minority-Serving Institution in California
Sterner (1999)	To study the barriers and facilitators focused on the entire faculty of a single PUI from faculty representing all colleges, departments, ranks, and years of experience	181 tenured or tenure-track faculty (for the survey) described by career levels, gender, recent grant activity, academic colleges, and years at the university; 10 tenured or tenure-track faculty (for the interviews) with two from each college	Bradley, a medium-size, predominately undergraduate, independent institution of higher education in Peoria, Illinois
Walden & Bryan (2010)	To discover the factors that impact grant-seeking (motivators and barriers) based on the faculty members' career-level and determine if their findings (faculty perceptions) are similar to those of other universities (i.e., Boyer & Cockriel, 1998)	35 College of Education faculty (self-elected, nonrandomized sample) described by gender and career-levels	A public, four-year, doctoral-granting university in the South classified as a Research University with high research activity by the Carnegie Foundation for the Advancement of Teaching

Methodological Attributes of Included Articles

Descriptions of the methodological characteristics, including data collection methods and data analyses, across articles, are provided in Table 2. For data collection, most of the articles used a fixed-response self-completion questionnaire, using Likert scales to rate the level of importance of items related to grant activities. Fewer articles utilized other data collection methods, including fixed and open response, fixed response and interviews, or interviews and/or focus groups. For data analysis, most of the articles included both descriptive and/or inferential statistics. Fewer articles (i.e., those with qualitative data collection methods) utilized qualitative data analyses or mixed methods. Detailed structured summaries of individual articles are provided in Online Resource 2 (https://osf.io/qp4bs/).

Table 2. Methods of Data Collection and Analysis Used in Articles of Faculty Perspectives

	Number	**%**
Methods of data collection		
Fixed response self-completion questionnaire	8	62%
Fixed and open response self-completion questionnaire	2	15%
Fixed response self-completion questionnaire and interviews	1	8%
Interviews and/or focus groups	2	15%
Methods of data analysis		
Descriptive and/or inferential statistics	8	62%
Qualitative data analysis	2	15%
Mixed methods	3	23%

Methodological Quality of Included Articles

As described in the methods section, we applied six quality assessment criteria and one overall methodological quality rating to the articles of faculty perceptions (Table 3). The majority of the articles employed a series of steps to increase rigor in sampling and presented findings that were grounded in or supported by the data. However, the majority of the articles did not take the necessary steps to increase rigor in data collection and analysis, and the articles did not achieve good breadth and/or depth in the findings (i.e., breadth as the extent of description and depth as the extent to which data has been transformed/analyzed). Additionally, most of the articles did not specify whether the perspectives of faculty were privileged (e.g., no mention of assurance of

confidentiality or no involvement with participants during the design of survey questions). The Overall Methodological Quality of the articles ranged from Low (N=8) to Medium (N=5) with mostly Low overall ratings (see Online Resource 3). None of the reviewed articles received a high overall methodological quality rating

Table 3. Number of Studies Adequately Displaying the Different Criteria for the Methodological Quality of the Articles (Scoring at least a 2 or 3 rating) (N=13)

Methodological criteria	N	%
1) Were steps taken to increase rigor in sampling?	10	77%
2) Were steps taken to increase rigor in data collection?	3	23%
3) Were steps taken to increase rigor in data analysis?	6	46%
4) Were findings grounded in/supported by the data?	11	85%
5) Was there good breadth and/or depth achieved in the findings?	3	23%
6) Were the perspectives of faculty privileged?	2	15%

Key: A score of 2 or 3 was required to be considered here as adequately displaying the different methodological criteria. A rating of 2 or 3 for criteria 1-4 (i.e., rigor of sampling, data collection, and data analysis and degree that the findings grounded in/supported by the data) meant a fairly thorough attempt was made or several steps were taken. For criteria 5 (whether or not there was good breadth and/or depth achieved in the findings), a rating of 2 or 3 meant there was good/fair breadth and depth or good/fair depth but very little breadth. For criteria 6 (were the perspectives of faculty privileged), ratings of 2 or 3 meant their perspectives were privileged a lot or at least somewhat.

Synthesis of the Findings

The findings describe eight key factors reported by faculty to be barriers to and facilitators of faculty grant activities. Across these eight key issues, three main emerging factors appeared to explain these barriers or facilitators. These three emergent findings can be considered core categories, including:

1. Building an organizational culture that values and supports grant activities;
2. Developing and implementing effective educational resources and learning opportunities; and
3. Providing technical assistance from expert RDPs.

These three core categories applied to faculty grant activities appear to impact whether a research support (or lack thereof) is a barrier or a facilitator for faculty grant activities (see Figure 4).

Each of these three core categories are defined within the discussion section in relation to their practical implications and recommendations for implementation.

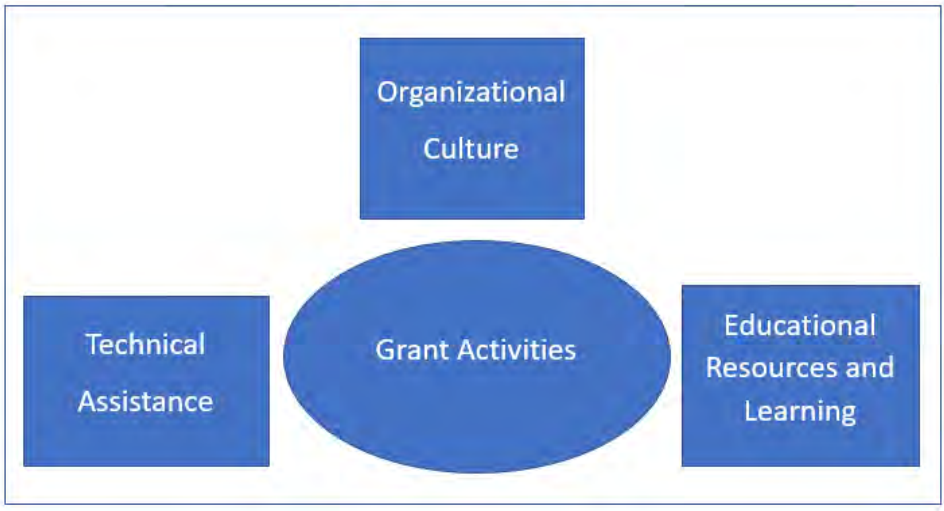


Figure 4. Emerging Factors

Barriers and Facilitators

Eight main factors emerged from the studies of faculty views. Faculty perceived the following eight main factors to be important for facilitating or hindering grant activities:

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.

One additional factor, 'scarcity of funding,' was mentioned in only two articles; therefore, it was not considered a main or significant issue, but should still be noted as a barrier to faculty grant activities (at a national level in the USA).

Grant proposal development support. The majority of the articles (11 out of 13) described barriers or facilitators to grant activities related to the need for adequate grant proposal

development support. The main factors related to grant proposal development support included a need for assistance with finding funding, technical personnel providing individualized clerical support with proposal development, resources for connecting with funding agencies, and assistance with budget development. Specifically, a 'lack of training in grant seeking' was reported by faculty to be an important barrier to grant activities, based on responses to Likert scales rating the importance of various factors related to grant activities (Boyer & Cockriel, 1998). Faculty also reported a lack of information about funding sources by not being notified about grants in a timely manner, as another hindrance to grant activities (Daniel & Gallaher, 1990). Moreover, faculty reported to value RDPs' support in 'identifying proper funding agencies and programs beyond distribution of lists of announcements and website links,' as indicated on Likert scales (Cole, 2007).

Several articles reported that faculty perceived having graduate assistants or clerical help as a facilitator to grant activities (Dooley, 1995; Monahan, 1993; Mullen et al., 2008), and a couple of articles, also using Likert scales to rate the importance of influencing factors, specified the importance of that support 'when proposals were funded' or 'when preparing proposals' (Boyer & Cockriel, 2001; Walden & Bryan, 2010). Additionally, faculty reported the importance of having grant writers (Dooley, 1995; Pinto & Huizinga, 2018) and liaisons to work with their university's sponsored research administration office (Dooley, 1995; Monahan, 1993).

Another important factor for faculty grant activities was having resources for connecting with funding agencies, which could include education or technical assistance on 'how to deal with prospective sponsors' (Boyer & Cockriel, 2001; Daniel & Gallaher, 1990; Dooley, 1995; Monahan, 1993). Faculty reported a 'lack of funds to travel to meet with funding agencies in preparation for writing proposals' as a strong to moderate barrier (Easterly & Pemberton, 2008). Another commonly expressed factor related to grant proposal development support was the need for assistance with budgets, such as education or technical assistance with preparing a budget and individualized post-award support with managing the budget (Dooley, 1995; Kleinfelder et al., 2003; Monahan, 1993; Mullen et al., 2008; Pinto & Huizinga, 2018).

Additional grant proposal development supports viewed as important by faculty included the need for training or assistance with proposal writing (Boyer & Cockriel, 1998; Dooley, 1995; Kleinfelder et al., 2003; Monahan, 1993). Assistance with the 'physical preparation of proposals' (i.e., boilerplate language or templates) and basic 'grants 101 assistance' were also viewed as important (Daniel & Gallaher, 1990). Faculty reported that having someone to review proposals was a facilitator to grant activities (Pinto & Huizinga, 2018).

Time commitments, assignments, and priorities. Ten of the 13 articles expressed barriers and facilitators to grant activities in relation to time commitments, assignments, and priorities. Teaching commitment was the barrier to grant activities that was mentioned the most by faculty, across nine of the 13 articles (Belgrave et al., 2019; Boyer & Cockriel, 2001; Daniel & Gallaher, 1990; Easterly & Pemberton, 2008; Kleinfelder et al., 2003; Monahan, 1993; Pinto & Huizinga, 2018; Sterner, 1999; Walden & Bryan, 2010). Committee or administrative assignments were expressed as barriers across five articles (Daniel & Gallaher, 1990; Easterly & Pemberton, 2008;

Kleinfelder et al., 2003; Pinto & Huizinga, 2018; Sterner, 1999).

Another related factor reported to be important by faculty in several reviewed articles was release-time provided for them to have the time to prepare proposals or work on funded proposals (Dooley, 1995; Kleinfelder et al., 2003; Monahan, 1993; Sterner, 1999). Two other reported time-related factors were 'flexibility in how time was allocated' and having research priorities outside of grant-related activities (e.g., publishing manuscripts) (Boyer & Cockriel, 2001; Daniel & Gallaher, 1990; Walden & Bryan, 2010).

Funding or resources from the university. Ten of the articles suggested that faculty perceived funding or resources from the university to be important to grant activities. Nine of these ten articles suggested internal funding to be a facilitator. For example, travel funds for conferences or to meet with peers or funding agencies were considered important (Boyer & Cockriel, 2001; Dooley, 1995; Monahan, 1993; Pinto & Huizinga, 2018; Walden & Bryan, 2010). Six articles mentioned the ability to purchase equipment as an important facilitator (Boyer & Cockriel, 2001; Dooley, 1995; Monahan, 1993; Mullen et al., 2008; Sterner, 1999; Walden & Bryan, 2010).

Additional university resources found to be important in facilitating grant activities included being supplied ample lab space, bridge funds between funded projects, and funds for pilot work and manuscript submissions (Cole, 2007; Mullen et al., 2008; Pinto & Huizinga, 2018). University funds to pay student research assistants or student tuition waivers and the ability to hire or utilize university support staff (e.g., research or laboratory staff, clerical support, and statistical or other expert technical support) was also perceived as important facilitators to grant activities (Mullen et al., 2008; Sterner, 1999; Walden & Bryan, 2010). Whereas, a reported barrier by faculty in one article was the absence of a clearly defined rewards system, where sometimes graduate assistants would be provided to work on an awarded grant but not always, or promises for matching funds (e.g., cost-share) would be broken (Pinto & Huizinga, 2018). A couple of articles mentioned the need for better graduate student recruitment (Cole, 2007; Dooley, 1995), and a couple more reported the importance of having a library of grantsmanship aids (Daniel & Gallaher, 1990; Mullen et al., 2008).

Seven of the thirteen articles expressed faculty views that barriers to grant activities were the indirect cost reimbursement policy and financial compensation for awarded grants (Boyer & Cockriel, 2001; Cole, 2007; Daniel & Gallaher, 1990; Dooley, 1995; Monahan, 1993; Sterner, 1999; Walden & Bryan, 2010). In some of the articles, the issue was specified to indirect costs not being returned back to the department, to the college, or to the faculty awardee (Boyer & Cockriel, 2001; Cole, 2007; Daniel & Gallaher, 1990; Dooley, 1995; Sterner, 1999; Walden & Bryan, 2010). Faculty also viewed having 'no reward' for awarded grants as a barrier and 'personal financial compensation' as a facilitator to grant activities (Dooley, 1995; Monahan, 1993; Walden & Bryan, 2010).

Faculty personal interests, knowledge, or attributes. Ten out of the 13 articles reported faculty to view their own personal interests, knowledge, or attributes to be a facilitator or barrier to grant activities. Some faculty reported a lack of personal interest in spending time on grant activities, saying "there are less labor-intensive things people can do to further their [professional] growth

and development" (Daniel & Gallaher, 1990, p. 10). Other faculty across several articles rated 'building my professional reputation as a capable researcher' or 'gaining recognition for my institution or program' as important factors of grant activities (Boyer & Cockriel, 1998, 2001; Dooley, 1995; Monahan, 1993; Walden & Bryan, 2010). Several articles rated the 'opportunity to research new information' as an important facilitator (Boyer & Cockriel, 2001; Dooley, 1995; Monahan, 1993; Sterner, 1999). Faculty in one study reported innovation or scholarly contribution as facilitators to grant activities by appreciating the "ability to focus research work in particular areas that might have a great impact and broader dissemination of results—thus impacting the field" (Walden & Bryan, 2010, p. 92). Several articles found faculty satisfaction with obtaining a grant or their individual drive in grant activities to be a facilitator, reporting that being awarded a competitive major grant was part of their career goals (Dooley, 1995; Monahan, 1993; Pinto & Huizinga, 2018).

Faculty also reported that their level of knowledge or skills in grant activities was an important facilitator or barrier. For example, technical skills, such as project management and grant writing skills, were viewed as facilitators (Belgrave et al., 2019). Additionally, having prior experience with securing grants (e.g., learning or assisting with grants at other universities or in graduate school), and 'knowing your audience' (i.e., understanding the sponsor's expectations) were viewed by faculty to facilitate grant activities (Easterly & Pemberton, 2008; Pinto & Huizinga, 2018). Some reported barriers were a lack of training in grant seeking, lack of knowledge of budget development, and being discouraged by rejected proposals (Boyer & Cockriel, 1998; Daniel & Gallaher, 1990).

Some personal attributes suggested by faculty to be important to grant activities included having tenacity, being innovative, and being confident that ideas are worthy of external funds (Belgrave et al., 2019; Easterly & Pemberton, 2008). Only one article asked questions to probe for attributes of faculty members' personal lives or living situations (Belgrave et al., 2019). In this article, the faculty reported a facilitator to be having a life partner who shares equally home and family duties and that their partner or family were supportive of academic work.

Sponsored research administration (SRA) (i.e., grant submission and management) policies, personnel, and support. Nine of the 13 articles found faculty to perceive SRA grant submission and management policies, personnel, and support to be a key factor in the facilitation or hindrance of grant activities. This was related to pre-award/grant submission process or the post-award/grant management infrastructure, or both. For pre-award, faculty viewed a lack of administrative support and infrastructure for getting grants submitted as a key barrier (Belgrave et al., 2019). Faculty rated that having 'inadequate support to submit in a timely manner' was an important barrier to grant activities (Boyer & Cockriel, 2001; Walden & Bryan, 2010). Several articles identified the importance of being able to quickly obtain necessary administrative approvals or signatures for proposal submissions (Daniel & Gallaher, 1990; Dooley, 1995; Monahan, 1993). Additionally, faculty rated the importance of RDPs 'assisting with proposal preparation' (e.g., assisting when required items are missing), 'support for processing the submission of grants,' and 'review and negotiation of contracts' (Dooley, 1995; Mullen et al., 2008; Walden & Bryan, 2010).

Three articles commented explicitly on post-award issues, e.g., the 'financial management of grants' or 'disbursement of funds' (Mullen et al., 2008). One article reported post-award barriers to include inexperienced post-award administrators, poor follow-through to pay contractors, and reports not being submitted on time, resulting in faculty having to hire their own personal administrator for post-award management (Pinto & Huizinga, 2018). Additionally, faculty rated post-award support services as a high priority for grant activities to 'reduce bottlenecks for better financial accounting' and to provide 'follow-up notifications to faculty of progress reporting and renewal proposal deadlines' (Cole, 2007).

Some of the reported SRA-related barriers or facilitators were not specific to either pre- or post-award. One key issue reported was the need for a centralized pre- and post-award (i.e., SRA) office. Faculty with decentralized pre- and post-award offices did not know whom to go to for support (Pinto & Huizinga, 2018). To 'add more research administration staff during times of peak proposal deadlines to overcome frustration and alleviate the increased workload' was rated on Likert scales to be a high priority to grant activities (Cole, 2007). Some other barriers to grant activities rated as important by faculty included a 'lack of technical assistance' and allowed 'budgetary items not reflecting the needs of the project' (Daniel & Gallaher, 1990). Rightly, faculty also rated 'support for compliance with safety and security rules' as an important facilitator for grant activities (Mullen et al., 2008).

Evaluation, tenure, and promotion. Nine of the thirteen articles reported barriers or facilitators related to the value placed on grant activities. In one article, faculty rated that an important support for grant activities was that 'writing proposals for external funding is valued at my institution' (Easterly & Pemberton, 2008). Faculty in eight articles specifically rated the importance of grant activity being part of the 'consideration in tenure and promotion' or consideration in 'evaluation/merit increases' (Boyer & Cockriel, 1998, 2001; Daniel & Gallaher, 1990; Dooley, 1995; Monahan, 1993; Pinto & Huizinga, 2018; Sterner, 1999; Walden & Bryan, 2010). Conversely, a revolving administration with differing expectations or inconsistent value placed on grants was reported as a barrier to grant activity (Daniel & Gallaher, 1990; Pinto & Huizinga, 2018).

Scholarly networks. In eight of the 13 articles, faculty viewed barriers and facilitators related to scholarly networks. Five of the 13 articles found faculty to view 'collaborators' to be a facilitator to grant activities. Diverse collaborators were mentioned, including collaborations with community members, collaborators at their university, peer-collaborators, industry connections, and collaborations with senior researchers (Belgrave et al., 2019; Cole, 2007; Easterly & Pemberton, 2008; Pinto & Huizinga, 2018; Sterner, 1999). 'Good collaborative research networks' was reported as a key facilitator (Belgrave et al., 2019). Additionally, several articles responded that 'having mentors' facilitated grant activities or 'a lack of mentors' was a barrier (Belgrave et al., 2019; Easterly & Pemberton, 2008; Mullen et al., 2008). One other reported facilitating factor related to scholarly networks was the development of interdisciplinary or research clusters to facilitate large-scale university proposals (Cole, 2007).

Scholarly climate. Six of the thirteen articles found that faculty viewed facilitators and barriers to grant activities to be related to the scholarly climate. Some faculty viewed 'the institution' itself or the 'general intellectual/scholarly climate' to be facilitators to grant activities (Belgrave

et al., 2019; Mullen et al., 2008). In four of the reviewed articles, faculty rated the importance of supportive upper administration or 'a strong commitment from the college president' for facilitating grant activities (Belgrave et al., 2019; Boyer & Cockriel, 1998, 2001; Daniel & Gallaher, 1990). Some faculty complained of barriers being an unscholarly culture not valuing the rigorous research necessary for grants or not valuing grants at the department level (Pinto & Huizinga, 2018; Walden & Bryan, 2010).

Additionally, transparent policies and procedures related to research was another key component of a scholarly climate that faculty reported to facilitate grant activities. For example, having poor interdepartmental communication about grant activities was thought to be a barrier to grant activities (Daniel & Gallaher, 1990). Additionally, having channels of communication and clarity of information on research policies, procedures, and guidelines and on research integrity or compliance was viewed as facilitators to grant activities (Mullen et al., 2008).

One article by Cole (2007) focused on understanding the attitudes of faculty and RDPs necessary for a scholarly climate. When referring to research administrators, using Likert scales, faculty rated high levels of importance to the need for changing attitudes to 'reduce arbitrarily implemented policies and be less rigid in their attitudes' and to 'offer services as the greater purpose and not just attending to compliance.' Faculty also rated the importance of the needed attitude changes from the faculty themselves to 'understand that administrators are trying to facilitate grant submission and administration and to treat administrators with mutual respect' and to 'be more sensitive to the time of research administration personnel and their workload.'

The discussion section describes how each of the eight issues relates to the three core categories and may support the service-delivery of RDPs, and recommendations for RDPs have been suggested. Additionally, practical implications, study limitations, and suggested future research are provided.

Discussion

We sought to answer the research question: "What factors are perceived to be barriers or facilitators to grant activities by research faculty based on extant literature?" There were eight important issues reported by faculty, and across those issues, the three main takeaways (or core categories) for RDPs were the importance of: 1) organizational culture; 2) educational resources and learning opportunities; and 3) technical assistance from expert RDPs.

Practical Implications

RD in higher education is a service delivery system with RDPs serving the role of practitioners and faculty as clients. The results of this systematic literature review are important because RDPs need to be able to provide evidence-based practice and this review informs RDPs of the factors that faculty (their 'clients') view as being most important to grant activities. Implementing effective client-centered research support services is critical for the success of faculty grant activities, especially since grant activities are most often a required job task for faculty and often necessary for promotion. Additionally, it is important that the organizational culture supports grant activity

and helpful educational opportunities, and technical support are offered to faculty to ensure autonomy and decrease regulatory burden. This has been studied in many ways from a research management perspective with meaningful changes in processes becoming normalized for future activities (Cola et al., 2022). It is from such examples that we can learn how to improve grant activity processes and better support investigators in meaningful ways. We define 'organizational culture' as the collection of values, expectations, and practices that guide the action of all involved, including faculty, research staff, upper administration, entire university research support offices, and academic departments or colleges. All the involved individuals and groups will also need to support effective educational opportunities and technical clerical support for faculty in order to facilitate grant activities. There is much literature that supports these ideas of organizational culture or climate as being important to ongoing research support services (Hackett, 1990).

Recommendations

The findings support several recommendations in response to the perceptions by faculty on factors of importance to grant activities. The three core categories can help to support the eight issues that were viewed by faculty as important to grant activities.

Organizational culture. A supportive organizational culture is key to facilitating all eight of the main issues related to grant activities. Based on faculty responses it is recommended to promote a scholarly organizational culture that supports grant activities. This culture includes supportive attitudes of RDPs that value grants and grant support, over arbitrary policies, and attitudes of faculty that express mutual respect for RDPs. It is recommended that internal funding opportunities are available (and promoted/announced) for scholarly pursuits, such as travel, funding for research student assistants, and matching (cost-share) funds. It is also recommended that faculty are rewarded for their grant activities, especially in their evaluation process, and awarded grants are recognized and announced within departments and colleges and university wide. Supportive policies for release-time from teaching and other assignments to work on grants are recommended. This may impact the individual drive of faculty for grant seeking and shows that grants are valued over or equally with other scholarly activities.

Based on faculty views, it is also recommended that mentor programs are created for faculty within departments, colleges, and university-wide and that faculty are supported in their effort to find collaborators. RDPs must encourage relational capacity in research, i.e., the ability to build deep and meaningful relationships with other researchers, such as mentors and collaborators (Cola & Wang, 2017). RDPs could host networking events based on a research topic and invite community members, possible industry partners, and researchers across disciplines. Positive collaboration and relationship building has been shown to improve performance, self-awareness, and many other measurable competencies across many cultures and work disciplines (Boyatzis et al., 2015). Additionally, RDPs can help faculty find collaborators with a specific skillset or research interest by providing them with a list of possible collaborators from faculty at the institution (or at others) with that same interest or skillset.

Additionally, clear channels of information about policies and procedures should be provided to faculty. Based on the views of faculty in the literature, it is recommended to have a central

office for SRA (grant submission and management), which reduces confusion on where to go for grant submission and management support and helps to facilitate streamlined policies and procedures. It is key that RDPs greatly value SRA employees (in the central office and across the university), and it is recommended that only technical experts in grants management be hired for these positions.

Educational resources and learning opportunities. Our findings suggested the utmost importance of educational resources and learning opportunities to facilitate faculty grant activities. It is recommended that faculty are provided with timely educational and training workshops on topics such as "how to recover from a rejected proposal," "how to know your audience [reviewers]," "Grants 101," and "steps within the proposal development process." Additionally, based on the responses of faculty we recommend faculty seminars (department-specific) on time management for tenure, how to connect with potential sponsors, and understand the indirect cost rate on grants and related disbursements of funds. Finally, it is recommended that faculty be provided with a library of grant activity aids (continuous support and resources), e.g., agency-specific grant writing workbooks. Based on faculty views, it may also be helpful to allow faculty to have time to hear from their peers or senior faculty within these workshops. It would likely be important to hold these learning activities in collaboration with multiple RD-related offices or groups.

Expert technical and clerical assistance. Based on the responses of faculty, it is recommended that faculty can receive technical assistance from expert RDPs in relation to their grant activities. Faculty need individualized help with finding funding opportunities, grant writing (or editing), working with compliance offices for submission or grant management, and connecting with funding agencies, potential community partners, or industry contacts. This level of individual or expert support may be especially valuable for junior faculty as well as for those faculty with less support at home. Additionally, it is recommended that faculty have expert support to assist with pre- and post-award management, such as making the signature/approval process for grant submissions as streamlined as possible, assisting faculty in dealing with sponsors (in the review and negotiation), and reducing bottlenecks for better financial accounting and reporting of grant funds and more timely purchasing practices. These process improvements are important and generalizable across research-related management practices (Strasser et al., 2013).

Limitations

The synthesis of qualitative research utilizes the findings of individual studies that are de-contextualized, and it could be possible that issues identified in one context may not be applicable to others (Thomas & Harden, 2008). An attempt was made to preserve context by providing detailed summaries of each study, including the study aims, faculty and university characteristics, methodological characteristics, and methodological quality detailed for each study. Therefore, it may also be beneficial for RD professionals to target one of the reported factors at a time, assess the perceptions of faculty specific to their university, and then strategize possible infrastructure, services, and resources within their university (while consulting the views reported in this systematic literature review). It should be noted that the results presented herein represent results obtained from the articles included in the systematic literature review, but they are not necessarily considered completely representative of all USA faculty that engage in grant activities.

Additionally, it may be the case that other barriers and facilitators to grant activities would be identified if this review was conducted on different countries or regions. Therefore, a potential future research area would be to conduct a similar review with an international focus.

The findings were described based on the number of articles per code. However, not all articles utilized interview or survey questions (e.g., fixed-response questions) that would lead the faculty participants to provide responses related to every code. Thus, it is important to note that the number of articles per response does not necessarily indicate that the barrier or facilitator is more or less important than others. The faculty responses are biased or based on the questions posed by the authors of each individual study. Other unknown barriers or facilitators to faculty grant activities that were not mentioned during interviews or surveys may be important to faculty grant activities, therefore, continued research in this area is necessary.

Future Research Directions

Further qualitative studies are needed with continued methodological rigor, across various faculty and university characteristics, to shed additional light on the perceptions of more faculty members within U.S. institutions and internationally. Additionally, further integration comparing the results of this and similar reviews (i.e., on faculty perceptions of barriers and facilitators to grant activities) to effectiveness studies of interventions (i.e., research-support services for grant activities) could provide further well-informed recommendations for evidence-based practices and continue to inform the development of chosen service-delivery strategies for practitioners in this field.

Conclusion

Faculty within U.S. institutions face many barriers and facilitators to grant activities, including: 1) grant proposal development; 2) time commitments, assignments, and priorities; 3) funding or resources from the university; 4) faculty personal interests, knowledge, or attributes; 5) sponsored research administration (i.e., grant submission and management) policies, personnel, and support; 6) evaluation, tenure, and promotion; 7) scholarly network; and 8) scholarly climate. Faculty, staff, administration (management), and university units require an effective 'organizational culture,' 'educational resources and learning opportunities,' and 'expert technical and clerical assistance' to address these issues.

In order to provide evidence-based practice supporting faculty grant activities, research development professionals are tasked with: 1) capitalizing on their professional expertise; 2) finding and utilizing the best evidence (i.e., empirical research on the effectiveness of research-support services/interventions); and 3) identifying the needs of their clients (i.e., faculty). This review offers the latter part of the triad of evidence-based practice by providing RD professionals with a review of faculty views on barriers and facilitators in grant activities to support pursuit of evidence-based and client-centered research support services by RDPs.

Acknowledgments

Thank you to the *JRA Author Fellowship Program*. Through this program, the first and second authors, Dr. Goff-Albritton and Dr. Cola, collaborated through a mentoring program and now are colleagues on this research and manuscript, allowing them to serve the field and share expertise.

Thank you to the Florida State University (FSU) Undergraduate Research Opportunity Program (UROP). UROP is an initiative by the FSU Center for Undergraduate Research and Academic Engagement to engage high-achieving undergraduates in the academic culture of research and offer help to university faculty members and staff. As UROP Research Mentors, faculty members, research staff, and advanced graduate students can receive research support from student assistants for a year-long period at no cost to the research mentor.

Rachel A. Goff-Albritton, PhD., CCC-SLP
Assistant Director, Office of Research Development
Florida State University
2021 Westcott North Annex
Tallahassee, FL, 32306
(850) 644-3044
r.goffalbritton@fsu.edu

Philip A. Cola, PhD
Associate Professor of Management and Medicine, Weatherhead School of Management,
Assistant Professor of Medicine
Case Western Reserve University

Jennifer Walker
Undergraduate Research Opportunity Program (UROP) Student
Florida State University

Judy Pierre
Undergraduate Research Opportunity Program (UROP) Student
Florida State University

Sandhya D. Yerra
Undergraduate Research Opportunity Program (UROP) Student
Florida State University

Isabella Garcia
Undergraduate Research Opportunity Program (UROP) Student
Florida State University

Correspondence concerning this article should be addressed to Dr. Rachel Goff-Albritton, Assistant Director of Research Development, Florida State University, 2021 Westcott North Annex, Tallahassee, FL, 32306, USA, r.goffalbritton@fsu.edu.

References

American Speech-Language-Hearing Association (ASHA). (2005). *Evidence-based practice in communication disorders* [Position Statement]. https://www.asha.org/policy/PS2005-00221/

Belgrave, F. Z., Moore, M. P., & Douglas-Glenn, N. E. (2019, November 26). *Barriers and assets to external funding for African American faculty*. https://www.ingentaconnect.com/content/routledg/tqse/2019/00000032/00000010/art00004

Boardman, P. C., & Ponomariov, B. L. (2009). University researchers working with private companies. *Technovation, 29*(2), 142–153. https://doi.org/10.1016/j.technovation.2008.03.008

Boyatzis, R. E., Rochford, K., & Taylor, S. N. (2015). The role of the positive emotional attractor in vision and shared vision: toward effective leadership, relationships, and engagement. *Frontiers in Psychology, 6*, 670.

Boyer, P., & Cockriel, I. (1998). Factors influencing grant writing: Perceptions of tenured and nontenured faculty. *SRA Journal, 29*, 61–68.

Boyer, P., & Cockriel, I. (2001). Grant performance of junior faculty across disciplines: Motivators and barriers. *Journal of Research Administration, 2*(1), 19–23.

Charmaz, K. (2014). *Constructing Grounded Theory*. SAGE.

Cola, P. A., & Wang, Y. (2017). Discovering Factors that Influence Physician Scientist Success in Academic Medical Centers. *Academy of Management Proceedings, 2017*(1), 12714.

Cola, P. A. & Wang, Y. (2022). Discovering factors that influence physician scientist success in academic medical centers. *Qualitative Health Research 32*(10), 1433-1436. https://doi.org/10.1177/10497323221108639.

Cole, S. S. (2007). Research Administration as a living system. *Journal of Research Administration, 38*(2), 14–27.

Cole, S. S. (2010). Reframing Research Administration. *Journal of Research Administration, 41*(1), 11–21.

Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage Publications.

Daniel, L. G., & Gallaher, I. (1990). Impediments to faculty involvement in grant-related activities: A case study. *SRA Journal, 22*(2), 5.

Decker, R. S., Wimsatt, L., Trice, A. G., & Konstan, J. A. (2007). *A profile of federal-grant administrative burden among Federal Demonstration Partnership faculty: A Report of the Faculty Standing Committee of the Federal Demonstration Partnership*. https://sites.nationalacademies.org/cs/groups/pgasite/documents/webpage/pga_054586.pdf

Dollaghan, C. A. (2007). *The handbook for evidence-based practice in communication disorders*. Paul H Brookes Publishing.

Dooley, L. M. (1995). Barriers and inducements to grant related activity by a college of education faculty. *Research Management Review, 7*(2), 10–24. https://eric.ed.gov/?id=ED372669

Easterly, D., & Pemberton, C. (2008). Understanding barriers and supports to proposal writing as perceived by female associate professors: Achieving promotion to professor. *Research Management Review, 16*(1), 1–17.

Etzkowitz, H. (1990). The second academic revolution: The role of the research university in economic development. In *The research system in transition* (pp. 109–124). Springer.

Goff-Albritton, R. & Cola, P. (2021, May). *Systematic literature review of barriers and facilitators to faculty grantsmanship* [Conference session]. National Organization of Research Development Professionals (NORDP), Virtual.

Gough, D., Oliver, S., & Thomas, J. (2017). *An introduction to systematic reviews*. Sage.

Hackett, E. J. (1990). Science as a vocation in the 1990s: The changing organizational culture of academic science. *Journal of Higher Education, 61*(3), 241-279.

Harden, A., Garcia, J., Oliver, S., Rees, R., Shepherd, J., Brunton, G., & Oakley, A. (2004). Applying systematic review methods to studies of people's views: An example from public health research. *Journal of Epidemiology & Community Health, 58*(9), 794–800. http://dx.doi.org/10.1136/jech.2003.014829

Kleinfelder, J., Price, J. H., & Dake, J. A. (2003). Grant writing: Practice and preparation of university health educators. *American Journal of Health Education, 34*(1), 47–53. https://doi.org/10.1080/19325037.2003.10603525

Lester, S., Lorenc, T., Sutcliffe, K., Khatwa, M., Stansfield, C., Sowden, A., & Thomas, J. (2019). *What helps to support people affected by Adverse Childhood Experiences? A review of evidence* [EPPI-Centre Report no. 3755, 1-221]. EPPI-Centre, Social Science Research

Unit, UCL Institute of Education, University College London. https://discovery.ucl.ac.uk/id/eprint/10087600/1/ACEs_report-041119_1.pdf

Monahan, T. C. (1993). Barriers and inducements to grant-related activity by New Jersey State College faculty. *SRA Journal, 24*(4), 9–26.

Mullen, C. A., Murthy, U., & Teague, G. (2008). Listening to those we serve: Assessing the research needs of university faculty. *Journal of Research Administration, 39*(1), 10–31.

National Organization for Research Development Professionals (NORDP). (2019). *Why NORDP?* https://www.nordp.org/about

Oakleaf, M. J. (2010). *The value of academic libraries: A comprehensive research review and report*. American Library Association. https://alair.ala.org/bitstream/handle/11213/17187/val_report.pdf?sequence=1

Pinto, K. M., & Huizinga, D. (2018). Institutional barriers and faculty persistence: Understanding faculty grant-seeking at a predominantly undergraduate institution. The *Journal of Faculty Development, 32*(1), 65.

Rees, R., Oliver, K., Woodman, J., & Thomas, J. (2009). *Children's views about obesity, body size, shape and weight: A systematic review* [EPPI-Centre Report no. 1707]. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.

Rockwell, S. (2009). The FDP Faculty Burden Survey. *Research Management Review, 16*(2), 29-44.

Rousseau, D. M. (2006). Is there such a thing as "evidence-based management"? *Academy of Management Review, 31*(2), 256–269. https://doi.org/10.5465/amr.2006.20208679

Saldaña, J. (2012). *The coding manual for qualitative researchers* (2nd edition). SAGE Publications Ltd.

Shepherd, J., Kavanagh, J., Picot, J., Cooper, K., Harden, A., Barnett-Page, E., Jones, J., Clegg, A., Hartwell, D., & Frampton, G. K. (2010). The effectiveness and cost-effectiveness of behavioural interventions for the prevention of sexually transmitted infections in young people aged 13-19: A systematic review and economic evaluation. *Health Technology Assessment (Winchester, England), 14*(7), 1–206.

Sterner, A. (1999). Faculty attitudes toward involvement in grant-related activities at a predominantly undergraduate institution (PUI). *SRA Journal, 31*(1), 5.

Strasser, J. E., Cola, P. A., & Rosenblum, D. (2013). Evaluating various areas of process improvement in an effort to improve clinical research: discussions from the 2012 Clinical Translational Science Award (CTSA) Clinical Research Management workshop. Clinical and translational science, 6(4), 317-320.

Thomas, J., & Harden, A. (2008). Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Medical Research Methodology, 8*(1), 45. https://doi.org/10.1186/1471-2288-8-45

U.S. Department of Education. (2018). National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS): Finance Component. https://nces.ed.gov/ipeds/

Walden, P. R., & Bryan, V. C. (2010). Tenured and non-tenured College of Education faculty motivators and barriers in grant writing: A public university in the South. *Journal of Research Administration, 41*(3), 85–98.

Whicker, M. L., Kronenfeld, J. J., & Strickland, R. A. (1993). *Getting tenure* (Vol. 1–8). Sage.

Wimsatt, L., Trice, A., & Langley, D. (2009). Faculty perspectives on academic work and administrative burden: Implications for the design of effective support services. *Journal of Research Administration, 40*(1), 71–89.