Environmental Change and Adaptation in Predominantly Undergraduate Institution Sponsored Programs Offices in Kentucky: A Multiple Case Study

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ABSTRACT

The decline in funding to state-supported institutions of higher education (IHEs) in Kentucky has compelled these universities to secure alternate forms of revenue to support their capacity to meet public expectations. These other funding streams include enrollment, philanthropic support, and acquiring sponsored funding for research projects and programs. While smaller state-supported Predominantly Undergraduate Institutions (PUIs) face resource and credibility challenges in their pursuit to expand external funding activity, they continue to strategically bolster their respective research enterprises amid shrinking budgets and increased competition for external funds.

This case study—conducted in Fall 2015 and Winter 2016—employed qualitative methods to gain an understanding of how three purposefully selected PUIs in Kentucky adapted to a decline in state appropriations and reconfigured organizational structures and roles to facilitate adaptation. Key findings in the study support the importance of upper-administrative knowledge building and leadership in expanding the PUI research enterprise. Additionally, strategic resource allocation, organizational restructuring, a strong policy base, and a focus on research development activities are critical elements in bolstering competitive external funding procurement.

INTRODUCTION

Complex organizations such as institutions of higher education (IHEs) depend heavily on the external environment for state appropriations, research support, and feedback from their constituencies that affirm or disconfirm the correctness of their direction. Consequently, they must be adaptive in order to survive when environmental changes occur (Chance & Björk, 2006). For state-funded IHEs, such changes are often fiscal in nature. Although the Great Recession officially ended in June 2009 (Gosling & Eisner, 2013), national and state-level economies continued to struggle and state funding for publicly supported IHEs declined, falling by an average of 17% between 2007 and 2012 (Barr & Turner, 2013).

State appropriations to state-supported IHEs typically cover 60 to 70% of their instructional costs; as a result, the decline in state funding has had far-reaching ramifications, including tuition hikes, personnel reductions, the elimination of entire programs, and the expansion of institutional activities to generate additional financial resources (Johnstone, 2011; Kane, Orszag & Apostolov, 2005; McLendon, Hearn & Mokher, 2009; Powers, 2004). In this resource-scarce environment, IHEs have been compelled to secure alternate forms of funding to support their capacity to fulfill their institutional missions. These other funding streams include increasing enrollment numbers, securing philanthropic support, and acquiring sponsored funding for research projects and programs (Johnstone, 2011). Larger state-supported institutions have both a broad donor base and "research strengths in areas of continuing public investment" (Johnstone, 2011, p. 336), and are consequently more favorably positioned to continue prospering amid declining state support, whereas smaller institutions are placed at risk, facing "declining state tax support . . . higher tuitions, more program closures, and an increasing reliance on part-time and adjunct faculty" (Johnstone, 2011, p. 336).

Despite these economic realities, administrators at smaller institutions are seeking ways to build their capacity to support and conduct research activities. Scholars have observed that administrative decision makers at these institutions are exerting increased pressure on both faculty and staff to conduct sponsored research, procure external funds, and engage in consulting activities to generate additional revenue (Altbach, 2011; Brewer, Gates & Goldman, 2009; Dehn, 2010; Dundar & Lewis, 1998; Kiley, 2012; Kuh, Chen & Nelson Laird, 2007). One indicator of this growth can be found in the National Science Foundation (NSF) Higher Education Research and Development Survey (HERD), which serves as a census of colleges and universities with $150,000 or more in annual research expenditures. The number of universities reporting to the NSF HERD

survey increased from 599 in 2003 to 907 in 2012 (Britt, 2012). Traditionally, however, larger, well-established, and more research-oriented universities receive the largest share of federal research funds. In fact, research institutions, as defined by Carnegie Classifications, receive 83% of all federal research and development expenditures (Garcia et al., 2009). In 2012, the top 30 universities reporting to the NSF HERD survey alone received nearly 40% of all federal research funding (National Science Foundation, 2013b). This growth in competition for federal funding has occurred in tandem with a federal funding environment that has remained relatively flat since the 1970s, with spending shifting to direct Social Security, Medicaid and Medicare payments to citizens (Haney, 2014). Adjusting for inflation, federal research expenditures to IHEs actually fell slightly in 2012 for the first time since 1974 (Britt, 2013; Haney, 2014). Nonetheless, smaller IHEs have worked strategically to position their universities to become more competitive in securing external funds as a response to shrinking budgets.

For example, in the Commonwealth of Kentucky—the study's target state—federally financed research expenditures at Kentucky Predominantly Undergraduate Institutions (PUIs) collectively grew by more than 300% between FY 2003–2012, according to the 2012 NSF HERD survey. Figure 1, which excludes one land-grant institution due to its ability to obtain federal funding not available to the rest of the population, summarizes these annual increases. The names of each institution have been replaced by pseudonyms to maintain anonymity. The current fiscal realities of federal research expenditures to institutions of higher education combined with an increased competition for funding have created the need for efficiency, ingenuity, and capacity building among PUIs. Institutions that can find ways to adapt, build upon existing strengths, and cultivate a culture of research excellence as an integral component of academic life will position themselves for success in an ever-increasing field of contenders.

SPOs serve as conduits through which institutions adapt to changes in the institutions' research support environment and contribute to their research growth and continued viability. Moreover, these offices also play a pivotal role in shaping externally sponsored research productivity. Sponsored research support not only provides project-specific funding, but it also allows PUIs to build a research infrastructure that attracts skilled faculty, talented students, and additional research funding. Consequently, research administration is integral to the research missions of these IHEs and an essential structure that enhances the capacity of universities to secure externally sponsored funding.

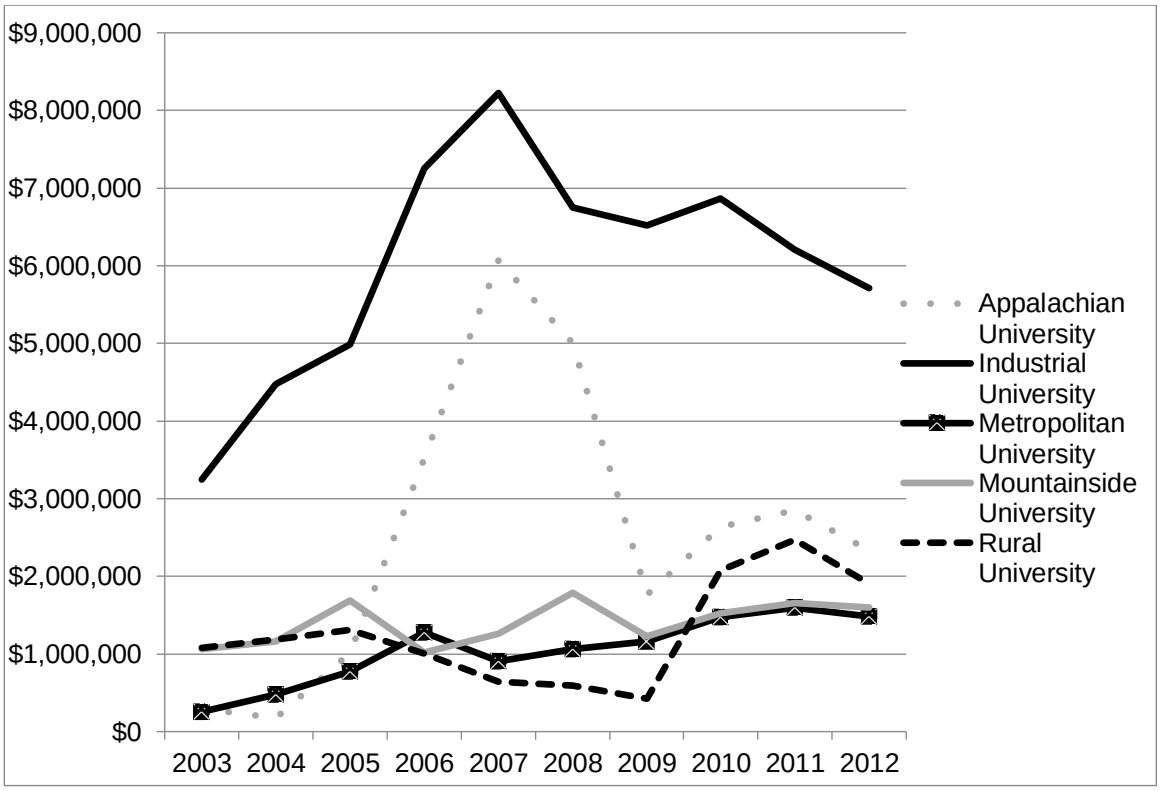

Figure 1. Federal R&D expenditures to Kentucky PUIs, FY 2003-2012
Adapted from National Science Foundation, National Center for Science and Engineering Statistics (2012), Federally financed higher education R&D expenditures, ranked by FY 2012 R&D expenditures: FYs 2003-12.

Despite the challenges state-supported PUIs face in pursuing and administrating federally funded projects, they continue to work toward building organizational structures that may facilitate research and alternative sources of income. Consequently, it is important to understand both the role of SPOs at PUIs in this emerging context as well as how they are organized to adapt to these changes. While the research enterprise involves many institutional stakeholders, there is a paucity of research focused on the SPOs that serve as essential structures for enhancing the capacity of universities to secure externally sponsored funding (Bailey, 2011; Carr, McNicholas, & Miller, 2009; Hamilton, 2010; Kane, 1999; Montoro, 2010; Muhammad, 1996; Waite, 2012; Wetherholt, 2013). Given the escalation in IHE competition for federally financed funding (Britt, 2012), this exploratory study has the potential to make a significant and timely contribution to the existing knowledge base on how PUIs may adapt to a decline in state appropriations and show how research administrators reconfigure organizational structures and their roles to facilitate adaptation.

STUDY DESIGN AND METHODS

This exploratory case study sought to gain an understanding of the perspectives of SPO staff members and chief research officers (CRO) about environmental changes affecting the research enterprise at their respective institutions. Kentucky has six state-supported PUIs; from this population, I excluded two additional institutions. Because I was employed as a research administrator in the SPO of a Kentucky PUI during the study, this institution was excluded from eligibility to reduce the potential for bias. In addition, the Kentucky PUI that is also a land-grant institution was excluded from eligibility because its status entitles it to numerous mechanisms of federal support not available to other Kentucky PUIs.

From the reduced pool of four institutions, I selected the three with the greatest increase in federally funded research expenditures between fiscal years 2003 and 2012 for inclusion in the study. Another consideration was the geographic diversity of the institutions. I purposefully chose to select institutions that represented three distinct regions of the Commonwealth. A final consideration was diversity in the amount of research funding each institution received. I purposefully selected institutions that exhibited low, medium, and high amounts of federal financed research expenditures as of fiscal year 2012 when compared to the population. This method of purposeful selection allowed me to select cases that best represent the phenomena being studied (Maxwell, 2005).

Additional advantages for examining the three selected institutions exist in their organizational diversity. Each university's research enterprise is structured differently, with varying job titles and organizational hierarchies, while simultaneously exhibiting funding growth. This demonstrates the systems theory concept of *equifinality*, whereby organizations can "reach the same end from different initial positions and through different paths" (Hoy & Miskel, 2007, p. 22).

Each selected institution is a state-supported, four-year university located in different regions of Kentucky. Each offers a comprehensive array of graduate degree programs and is characterized by very high undergraduate enrollment (Carnegie Classification of Institutions of Higher Education, 2015). Table 1 provides information related to each institution's research enterprise to provide a sense of size and scope. The data included were derived from institutional research and SPO reports published in 2014, with the exception of federal research funding and federal R&D expenditure increases, which were extrapolated from NSF National Center for Science and Engineering Statistics (NCSES) data (National Science Foundation, 2012a). In order to maintain

anonymity, the names of each institution have been replaced with pseudonyms.

Table 1. Site Description

Characteristic	**Appalachian University**	**Metropolitan University**	**Industrial University**
Enrollment (FY 2014)	16,305	15,114	20,000
Total Sponsored Projects Funding (FY 2014)	$45,444,635	$8,148,582	$20,913,079
Full-time Faculty (FY 2014)	680	550	785
Federal Funding (All Sources, FY 2014)	$27,353,589	$5,709,243	$14,774,677
Federally Financed Research Expenditures, FY 2012	$2.3 Million	$1.4 Million	$5.7 Million
Federal R&D Expenditure % Increase (FY 2003- FY 2012)	784%	582%	176%
Sponsored Programs Office Size	4	6	7
Chief Research Officer	Associate VP for Research	Vice Provost	Associate Provost

Data were collected through (a) a pre-survey administered electronically to all study participants, (b) document review, and (c) individual participant interviews conducted both onsite and via telephone with each institution's CRO and SPO staff. Interviews were the primary data collection method, and were in-depth, loosely structured, and open-ended to allow respondents latitude for conveying facts and opinions and the exploration of new ideas that emerged from the dialogue (Merriam, 1998). I digitally recorded all interviews and then transcribed the audio files for data analysis.

To analyze data collected at each site, I used a *categorical aggregation* (Stake, 1995) approach, placing data into overarching groups. This method is a systematic and intuitive process "informed by the study's purpose, the investigator's orientation and knowledge, and the meanings made explicit by the participants themselves" (Merriam, 1998, p. 179). Due to the large amounts of data, I used NVivo, a computer-based qualitative data analysis software package, to facilitate the data coding process. After inputting all documents and interview transcripts into NVivo, I reviewed all data, using the software to highlight concepts, passages, and quotes. Then, I identified any patterns, relationships, or themes connected to the previously constructed categories. The analysis continued with a further

coding of entries in NVivo based on the patterns, relationships, and themes discovered, until the chosen categories were reasonably "justified by the data" (Hatch, 2002, p. 157).

FINDINGS AND ANALYSIS

This study explored the relationship between decreases in state appropriations and changes in selected Kentucky PUIs and examined how internal and external environmental changes influenced adaptive responses, including reconfiguring institutional policies, modifying the role of research administrators, and restructuring SPOs to increase the degree of research productivity and procurement. Three purposefully selected Kentucky PUIs served as sites for the multiple-case study. Six themes emerged during the course of the study and serve as a framework for presenting and analyzing the data. These themes are: (a) administrative disconnect, (b) strategic focus and targeted approach, (c) external funding trends, (d) research development, (e) effects of budget cuts, and (f) regulatory changes.

Administrative Disconnect

The most prevailing theme that emerged from the data is a perception among CROs and SPO staff members of an administrative disconnect with respect to the realities of conducting sponsored programs at the selected ERIs. Specifically, respondents referred to academic department chairs and deans as well as cabinet-level administrators, including vice presidents and provosts, and the university president. For example, the CRO at Appalachian University (AU) summarized this persistent theme when stating, "I think we have to do a better job educating our higher administration folks in terms of what sponsored programs can and cannot do." It captures a sense of reality among those who provide the day-to-day support for submitting external funding proposals and managing awards that there is dissonance between what administrators say about the importance of receiving external funding for research, on the one hand, and their providing adequate support for sponsored programs in terms of resources, organizational structures, and institutional policies, on the other hand.

This sense of dissonance emerged as participants reported a general lack of institutional prioritization and support for research apparent in organizational structures. For example, in many instances responsibility for research was combined with a wide array of other disparate institutional units and management operations of research foundations. Study participants viewed these circumstances as both ineffectual and wasteful. In addition, policies at each ERI placed little to no emphasis on the acquisition of external funding as a criterion for faculty tenure and promotion decisions.

Strategic Focus and Targeted Approach

Despite the perception of a senior-level administrative disconnect to the intricacies of fostering and conducting sponsored research at the studied ERIs, evidence collected during the study also revealed a distinct and significant trend among these institutions toward establishing a strategic research focus and developing targeted approaches to support it. For example, an administrator at Metropolitan University noted, "It seems like the emphasis went from the numbers being high to the quality of the proposals and the tie-in with the greater strategic plan, whether it means anything to this institution or not." The SPO Director at Industrial University (IU) echoed this sentiment:

> The one thing I see, we don't really have a niche area yet for research. Where are the next opportunities? Where is the funding? So, I'd like to see that evolve. I'm really pushing now for us to really take a step back and start looking at what are the state strategies, taking the strategies and matching them to our strengths, and investing in that.

Establishing focus with respect to sponsored research also manifested in each institution's emphasis on policy creation and revision. AU's CRO stated that his institution did not give much focus to sponsored research policies prior to his arrival in 2005. "We've gone through . . . a very challenging time," he said, "in terms of just making sure that we met the compliance standards." At MU, the new CRO created new internal policies for faculty and staff submitting grants, requiring them to provide the SPO their materials for review no later than five business days prior to the deadline. "We were kind of worried in our office," said one MU administrator. "These new policies, these hard and fast rules will really turn people off. [The CRO] didn't seem to be concerned about that . . . she said if they don't submit, then they don't submit." Another MU administrator spoke about this policy, noting that it was "definitely a change in the culture, and that was the whole point of the thing."

Finally, while each institution made organizational and hierarchical changes in an attempt to bolster and support research activity, changes made at IU actually hindered research growth. The SPO associate director spoke further about this:

> Even before [the current director's] arrival, we had so much turnover at the top and different structures. [We had] to deal with different philosophies and agendas and personalities, and I think if anything has hampered [sponsored programs growth], it's that. All that change. Because once you get started down a path . . . dealing with one person's way of doing things, and then have to abruptly stop and redirect . . . you have to start over.

In 2010, this move toward a focus on research continued when IU made a significant move in its research enterprise

by creating and hiring an external, vice president-level CRO position that reported directly to the president, which was a hierarchy unique to all Kentucky ERIs. This hire, the SPO director noted, was part of a push from the president to "make research more of a priority than it had been." During this time, the research organizational structure became highly differentiated with separate units under the vice president for research related to (a) economic development, (b) marketing, (c) a research foundation, and (d) sponsored programs. As noted by SPO staff members, the structure did not work for a variety of reasons, including the leadership style of the former CRO and the institution's unpreparedness to make such a drastic shift. Regardless, one can argue the position is representative of IU's dedication to growing external research.

An administrative focus on expanding the acquisition of external research funding through strategic and targeted investments was discussed by Björk (1983), who found that administrators at IHEs seeking to become more research-intensive acknowledging the necessity of "providing additional resources either in time or dollars" (p. 35). More recently, the work of Conn and colleagues (2005) not only affirms this overarching idea but also expands understanding of this concept. They asserted the importance of attending to several additional elements integral to success in creating effective organizational units and institutional research cultures, such as (a) policy development, (b) strategic hires, (c) financial investment, and (d) organizational restructuring. Findings by Edwards (2010) also affirm the notion that a strong research culture is a hallmark of larger, more research-oriented universities, suggesting that these study findings are consistent with a general trend for PUIs to increase sponsored activity as a response to fiscal austerity.

External Funding Trends

Analysis of total external funding for each ERI included in the study and by fiscal years (2003–2012) indicates some fluctuation in overall totals as well as slight increases for AU and MU, and a significant decrease for IU. However, an examination of the NSF HERD data on federally financed research expenditures during this same time period shows significant increases for each institution. Data collected through interviews with staff at each site helped explain discrepancies between institution and NSF HERD reported data with regard to both fluctuations and increases in receipt of federal funding for research. One emerging theme consistent across the PUIs studied was the loss of federal *earmarks* (e.g., congressionally appropriated funding) for research projects in 2010 that caused a decline in external funding totals. For example, the CRO at AU succinctly summarized the viewpoints obtained through interviews with administrators and staff at all three PUIs: "One of the things

that probably changed the most is when I first arrived here most of our federal funded programs were actually put through as Congressional appropriations targeted for special areas, special initiatives, and those have essentially evaporated."

During the years between fiscal years 2003 and 2012, AU and IU reported an increase in the number of competitive proposals submitted by faculty. A closer examination of these data indicated that the increase was largely attributed to their participation in statewide federal grant programs funded through the NSF Experimental Program to Stimulate Competitive Research (EPSCoR) program and the NIH Institutional Development Award (IDeA) Networks of Biomedical Research Excellence (INBRE) program. Both were designed to increase the research capacity and competitiveness of smaller institutions. While one cannot claim a causal relationship between the loss of federal earmarks and the intentional move to increase competitive external funding, a correlation is present.

Speaking about funding trend changes at AU, the SPO director said, "We have definitely increased our competitive [submissions] over the last 5 years. I'd say tremendously. I mean, maybe not so much the bottom line, but the amount of proposals being sent in a competitive nature." The IU SPO director noted that an upward trend in funding in the previous year was due to "tremendous success in EPSCoR, [INBRE] and things like that, which had now in some ways translated into more . . . federal grants. So, that kind of ladder for faculty has had some success."

The PUIs examined in this study initially leveraged NSF EPSCoR and NIH INBRE funding to create research support units to enhance their competition for federal funding and maintain institutional vitality (Bess & Dee, 2008). Data affirmed that these three institutions not only developed more robust internal organizational structures to support faculty pursuit of federal funds, but also viewed their efforts as an integral part of sustaining the well-being and vitality of their respective institutions. In addition, the loss of federal earmarks stimulated them to make the decision to become more strategic in the pursuit of external funding.

Research Development

Research development emerged as a critical theme in the study and appears to undergird institutional efforts to strengthen their capacity to secure external funding. Research development activities (e.g., internal grant and training programs, proposal support functions, and allocating personnel to managing these tasks) have been present to some degree at all three schools. However, data indicated a recent and intentional push to bolster research development activities across institutions that shared the goal of increasing external funding proposals and awards.

Although each PUI funds and manages internal grant programs and conducts faculty training related to grantsmanship, they varied in breadth and depth. For example, SPOs with larger budgets and more comprehensive training programs also received higher levels of awards from federally funded sources. Although MU had a less robust internal grant support program in comparison to the other PUIs, the SPO director believed research development lagged because faculty were able to secure internal funding support from other units on campus:

> It could be the faculty senate, or the individual colleges do it. There are a number of places that hand out that kind of money. And I think in many ways that's a detriment to people actually applying to external funding, because it's so easy to get $5,000 or $10,000 for some little project that they want to do, and people seem to be satisfied with just that, and they can reapply year after year and keep getting it.

Despite various forms of internal financial incentives, all three ERIs were unable to motivate faculty to submit external grants. For instance, comments by the SPO associate director at IU on the effectiveness of this strategy summarized the thinking of staff at all three institutions: "I think the people who realized what it was and took advantage of it certainly, it incentivized them, but not in the positive way that it was intended to."

Similarly, all three PUIs reported the critical nature of proposal support functions such as narrative proofreading and budget development in maintaining and expanding the number of faculty submitting proposals for external funding. All ERIs expressed the need for additional staff dedicated to managing research development. However, all were faced with budget restrictions that limited their ability to hire new staff. Although AU and IU had at least one person primarily focused on research development activities, MU only recently accomplished this by modifying an existing position after the person responsible for research development retired in 2013.

Scholars acknowledge the importance and expansion of research development support activities as a part of PUI research administration functions (Conn et al., 2005; Edwards, 2010; Mason & Learned, 2006; National Organization of Research Development Professionals, 2014). For example, Edwards (2010) found internal grant programs "critical to fostering a culture of grantsmanship and scholarship" (p. 95), and Conn and colleagues (2005) documented the success of pre-award activities in enhancing research productivity. The basis for enhancing institutional research capacity was described by Mason and Learned (2006) as a response to poor economic conditions and declining levels of institutional support; however, they noted that these circumstances often placed a burden on the

SPO to assist institutions in securing external resources. In order to ensure success, Mason and Learned persuasively argued that an expanded role for SPOs should commensurately include "new positions within the existing office to offer various support services required in the [research] development process" (p. 28).

Effects of Budget Cuts

A decline in state allocations to the selected PUIs affected the SPOs in several ways. Although no employees lost their positions, budget cuts did result in staff losses through attrition. For example, AU and MU were unable to replace individuals who retired or otherwise left the university and who were critical to the functioning of these research support units. Data gathered through this study suggested that personnel losses created a greater difficulty in providing services to faculty. With respect to professional development opportunities, both AU and IU noted that state-level budget cuts had limited or altogether eliminated their ability to travel to conferences and other continuing educational opportunities.

A reoccurring theme that emerged when interviewing study participants was the low morale among SPO staff members caused by budget cuts. Low morale was exhibited in several ways. For example, at AU one staff member indicated that budget cuts created a sense of anxiety about her job security. For personnel at MU and IU, the feeling of low morale was an outgrowth of no salary raises during the past several years. At MU in particular, stagnant salaries among SPO staff members contributed to "cynicism," according to one participant:

> We get no raises . . . we're understaffed. [Senior administrators said] sorry, we're too poor. We've been cut here, we've been cut there. [Senior administrators told us] you've got great benefits, so be happy. We're not going to give you any more money, but we are going to require you to do more, and to be more educated, and be knowledgeable and unbelievable in a lot of different areas with a lot of different computer programs and whatnot. If we went out into a different world . . . we'd probably be paid twice as much. So those expectations are there.

Additionally, while the SPO at MU was able to add personnel, budget cuts restricted the ability to maintain competitive salaries. Study participants at MU also reported a significant level of staff turnover due to the institution's proximity to a large metropolitan area in a contiguous state where other institutions and companies "have paid them more money or recruited them out of here."

Scholars have studied employee morale in a wide array of organizational contexts but have only in the past few decades focused their attention on those working in IHEs (Treuter, 1993); however, most studies focused on faculty rather than administrators. Although the foci of research related to faculty morale varies considerably, findings about the effect of

salary levels on morale concur that lower salaries correlate with low morale and low job satisfaction (AbdulCader & Anthony, 2015; Gardner, Blackstone, McCoy, & Veliz, 2014). Previous studies by Kerlin and Dunlap (1993) on faculty morale during periods of fiscal austerity reported that faculty became "increasingly discontent with their jobs and their employing institutions" (p. 350). Although these findings suggested a link between budget declines, low salaries, and low faculty morale, they underscored the need for research focused on academic staff, morale, and job satisfaction. There is considerable consensus among scholars about the importance of studying research administrator morale in these contexts and understanding occupational stress (Katsapis, 2008; Shambrook, 2010; Shambrook & Mintzer, 2007).

Regulatory Changes

When the Office of Management and Budget (OMB) first proposed changes to federal grant regulations in February 2013, the field's two major professional development organizations focused on the potential changes and ramifications these changes would have on IHEs. This may have contributed in part to the general front-end anxiety and planning that took place at universities across the country. For example, the SPO director at IU implied this when talking about the Uniform Guidance directive: "Well, we got all excited like everybody else." Although some may view recent changes in federal regulations embodied in the Uniform Guidance (2014) as complicating the nature and direction of research administrators' work, this did not emerge from the data. A general consensus among study participants was that new federal guidelines were more about shifting and combining certain rules and regulations into one large document rather than instituting sweeping changes. For example, one staff member at IU referred to the Uniform Guidance as simply "a different set of bookmarks." Further, all participants agreed that the most significant changes to the federal regulations would probably only adversely affect large, research-intensive institutions.

However, research administrators across all three PUIs included in this study did note one of the biggest challenges in the Uniform Guidance (Office of Management and Budget, 2014) was in procurement regulations. Although the procurement offices at MU and IU handle all institutional purchasing regardless of funding source, the SPO at AU is responsible for processing all purchases associated with externally funded grants and contracts. AU staff members also remarked that these more prescriptive regulatory changes would allow them the opportunity to pass externally funded procurement duties to the procurement office. Thus, SPO staff members at AU viewed the Uniform Guidance (Office of Management and

Budget, 2014) as a way to lessen their work burden.

Although federal funding awarded to IHEs during the years immediately following World War II typically did not include compliance with regulatory mandates, these circumstances quickly changed when agencies began to focus on accountability (Beasley, 2006). Norris and Youngers (1998) observed that as the regulatory environment for managing sponsored funding became increasingly complex, it altered the nature of research administration: It shifted from a profession primarily focused on supporting faculty through the pre-award process to one of focusing on both proposal support functions and regulatory compliance. These shifts are indicative of findings reported by Schneider and colleagues (2012) on faculty who reported spending 42% of the time allocated to externally funded projects on administrative tasks.

RECOMMENDATIONS FOR PRACTICE

Study findings suggested several recommendations for practice. For example, SPO staff members and CROs should work with administrative leaders at PUIs to develop a realistic understanding of the institution's research enterprise, including (a) its potential contribution to enhancing the institution's ability to acquire scarce resources, (b) the need to develop the capacity of the SPO to support faculty pursuing external funds, and (c) the re-culturing of the institution through development of policies that reward faculty for pursuing and acquiring external funds. Although chief academic officers and other cabinet-level officials have competing responsibilities that may inhibit expert knowledge in any one area, a cursory understanding of research administration and reliance on their CROs as advisors in the decision-making process may prove beneficial.

Study findings indicated that although PUIs included in the study had different organizational structures, roles, titles and number of SPO staff members, all increased their federally funded research expenditures. These data affirm the perspective of Hoy and Miskel (2007), who posited that organizations may operate effectively through a variety of different structures and processes. Despite variation among organizational structures, there is a shared understanding of the need to establish an institutionally appropriate research structure to ensure the success of their respective research enterprises. The importance of appropriate structures is underscored by the case of IU, which created a large and highly specialized structure that effectively inhibited rather than stimulated development of support services. Consequently, it is important for PUIs to implement size-appropriate strategies rather than simply emulating those in place at research-extensive institutions. Further, the lack of strategic

planning for research was endemic among all three universities studied, given the absence of any cohesive strategic research direction. An understanding of the dynamic relationship between occurrences in the external environment and their effect on the institution in this context can provide these PUIs with the feedback necessary to make appropriate alterations to their work and organizational structures, allowing them to develop cogent responses aimed at strengthening research efforts.

In order to support faculty research development, PUIs may be well served by investing in comprehensive internal grant programs that prepare and motivate faculty to submit proposals to acquire external support. In the current austere budget climate for IHEs, resources must be strategically allocated. For example, data from MU indicated numerous sources of internal funding beyond the SPO. Findings suggested that these multiple and competing internal funding sources at MU may actually be hindering efforts to develop the capacity of faculty to compete for external funds.

In addition, monetary incentives should be focused on rewarding faculty who complete research proposals to secure external funding rather than providing monetary incentives to those who may submit proposals as a way to supplement their income. In sum, internal funding programs should be managed solely by the research enterprise to provide a consistent and coherent program to enhance institutional capacity to conduct research.

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