Strategies for Increasing Research at a PUI

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Abstract: *The purpose of this study was to analyze and develop an in-depth understanding of the characteristics of an R3, predominantly undergraduate institution of higher education with a high-performing externally-funded research portfolio. This study used a qualitative single-bounded case study approach and utilized a focus group structure for the interviews. The research questions sought to identify the perceived factors, characteristics, and resources believed to motivate researchers to participate and succeed in externally-funded research. Active faculty researchers comprised the target audience and focus group participants for this study. The results revealed a cohesive infrastructure with high levels of mutual gratitude and respect among the diverse groups of individuals and the entities that constitute the research infrastructure. The collective efforts to support research, funded and unfunded, is immense and strategic at this institution. Researchers believe the leadership embodies the definition of transformational leadership by utilizing their personal experiences and knowledge to create positive change, motivate and encourage, and build confidence and respect toward and from their researchers. In addition, the leadership recognizes the need for continuous change and improvement of the research infrastructure and actively acknowledge, seek, and act on the needs of the research community. This institution has actively facilitated a culture shift to focus on research at a predominantly undergraduate, teaching-focused institution. This study identified and explored the myriad of resources provided to faculty researchers in the area of research and scholarship and identified those found most beneficial by the researchers. It identified the perceptions and attitudes regarding infrastructural resources in support of research activities. The results of this study will help doctoral level PUIs strengthen their faculty scholarship base, develop a more robust and efficient infrastructure, and increase their externally-funded research portfolio. Successful and meritorious faculty will further engage students and positively affect student recruitment and retention.*

Introduction

Prior to 2008, funding for higher education was plenty and institutions were financially healthy. However, the economic crisis and budget cuts in education caused institutions to look differently at the role external grants can play. The 2009 American Recovery and Reinvestment Act (ARRA) propelled new interest in grantsmanship (Waite, 2012). ARRA earmarked billions of dollars in federal funds for a wide variety of initiatives that were meant to reinvest in the economy by creating jobs and improving K-12 and postsecondary education. A supplement to the ARRA, the America COMPETES Act required a portion of these funds to be awarded to institutions of higher education in the form of competitive grants (Waite, 2012).

These new grant opportunities led to a realization by faculty and leadership at institutions of higher education (IHEs) of the significant benefits, both financially and professionally, of externally-funded grant activity (Behar-Horenstein, Garvan, Catalanotto, & Hudson-Vawell, 2014). One of these benefits is that faculty who receive external grants can provide their students with invaluable hands-on experiences that otherwise would not be available. According to the American Council of Learned Societies, "faculty who involve students in their research projects sharpen students' expertise in a specific area and foster discipline, independent thought, creativity, and responsibility" (2007, p. 10). In addition to student employment and experience, grant funds are commonly used to purchase expensive, specialized pieces of laboratory and simulation equipment that otherwise would be out of reach by many IHEs, especially publicly-owned, predominantly undergraduate institutions (PUIs).

According to the literature, IHEs with large and diverse externally-funded grants portfolios have leaders who understand what it takes to be successful and, therefore, pro-actively support grantsmanship. They provide resources that further develop faculty expertise and credibility in their fields (Hardre, Beesley, Miller, & Pace, 2011; Waite, 2012). This additional support is necessary because many faculty, especially those teaching at PUIs, may not have had research-active faculty to expose them to research during their educational tenures (Burgoon, 1988; Hardre, et al., 2011).

Providing focused and customized professional development opportunities that specialize in grantsmanship help motivate faculty, remove roadblocks, and increase the potential for successful grant awards (Burgoon, 1988; MacFarlane & Hughes, 2009; Waite, 2012). Understanding both the benefits of external funding and the various challenges faced by faculty researchers is essential to creating and maintaining a supportive and successful research environment (Akerlind, 2008; Behar-Horenstein et al., 2014; Waite, 2012). This holistic understanding recognizes that the integration of faculty members' research and scholarly activities with their teaching and service requirements is the underlying objective of academia. The successful integration of these factors creates the ultimate teacher-scholar (Akerlind, 2008; Behar-Horenstein et al., 2014; Simmons, 2009). Knowing the factors that motivate faculty to participate in research and understanding best practices in the field of faculty professional development and grantsmanship will allow university administrators to make educated decisions regarding the use of institutional resources to help strengthen their externally-sponsored research portfolios (Hardre et al., 2011). Creating an effective infrastructure that provides resources that address both teaching and scholarship will allow institutions to deal effectively with cyclical declines and variances in funding opportunities.

IHEs are classified, among other variables, according to their research portfolios. This classification is used by the NSF to assess eligibility for various grant opportunities. The Carnegie Classification System is the recognized method of classifying IHEs. The Carnegie System distinguishes IHEs using a multitude of variables, including but not limited to undergraduate and graduate enrollment, disciplines, location, and research activity. A doctoral granting institution can be classified in one of three levels: R1 (highest research activity), R2 (higher research activity), and R3 (moderate research activity). According to the Carnegie Classification criteria, R3 universities

award at least 20 research doctoral degrees in the humanities, social sciences, and STEM fields and maintain a "moderate" level of research activity (Carnegie Foundation, 2007). Institutions that hold an "R" classification may offer master's or professional practice degrees in fields other than medicine, dentistry, or veterinary medicine, as well. These institutions, although classified as doctoral, may also have a predominantly undergraduate population (Carnegie Foundation, 2007). The institutions that are categorized as R3 (moderate research) and considered predominately undergraduate are the focus of this study. This single case study examines the characteristics or factors perceived to influence researcher participation and success at a high-performing R3 PUI.

Problem and Purpose of the Research Study

PUIs classified as doctoral research universities are distinct because faculty at this type of institution face unique challenges. Faculty employed at a PUI commonly define themselves as teacher-scholars but commonly lack the research infrastructure and resources available to their R1 or R2 colleagues. Teacher-scholars have a commitment to both scholarship and teaching and they allow their scholarship to inform and improve their teaching (Akerlind, 2008; Bailey, 1999; Behar-Horenstein et al., 2014; Kuh, Chen, & Laird, 2007; Waite, 2012). This goal is noble, ambitious, and resource-intensive. As discussed above, financial resources are dwindling in education, and institutions are struggling to find alternative ways to fund these ancillary, yet necessary, activities (Waite, 2012). It is, therefore, becoming increasingly necessary for faculty to find alternate sources of funding to support their research. External grants are an ideal solution to this financial problem (Hardre, et al., 2011; Waite, 2012).

The contractual workload for faculty at PUIs is less flexible than their research-intensive counterparts or the institutions with a larger faculty base (Waite, 2012). Heavy teaching assignments, undergraduate and graduate student advising, and both institutional and community service requirements are common at PUIs (MacFarlane & Hughes, 2009). Generally, PUI faculty have little ability for an institutionally-funded reduced load. Faculty at PUIs are at a disadvantage because of these workload characteristics and may, subsequently, not be as successful in securing external grants as their counterparts at research-intensive institutions. Faculty at research-intensive universities have an unfair advantage over faculty from PUIs when competing for external funds (Porter, 2007; Waite, 2012).

A broader, more far reaching impact of the inequity deals with attracting and retaining students and faculty members. Enrollment continues to decline across the country, and institutions are struggling to reconcile the costs of doing business with increasing budget cuts and decreasing revenue streams (Bailey, 1999; Buller, 2013; Hardre, et al., 2011; Waite, 2012). The budget deficits affect an institution's ability to provide up-to-date technology, laboratory facilities, libraries, graduate assistantships, and a multitude of other educational resources. Recruiting and retaining quality faculty becomes difficult when the institution is unable to provide the extrinsic motivators that top research institutions take for granted. Having quality resources and a strong research infrastructure will attract highly qualified teacher-scholars who are committed to the success of the PUI model (Akerlind, 2007; Kuh, Chen, & Laird, 2007; Ware, 2006).

To best understand why the teacher-scholar model is essential to the success of higher education, it is necessary to understand how and why research originally started in the field of academia. The "nexus" of academia is reached when teaching and research overlap and become mutually dependent activities (Clark, 1997). We will, therefore, explain some of the history of research within academia.

Higher education in America and abroad has undergone significant change since Harvard's founding in 1636 (Kane, 1999). Harvard and other early American universities held teaching (primarily of the clergy) as their core function. It was not until the nineteenth century when Germany introduced the concept of including research as a "vital component of higher education" that research became part of academia (Gellert, 1993, pp. 3-14). Germany, therefore, can be credited with incorporating research into academia and realizing the mutually beneficial relationship between teaching and scholarship. American students being educated in Germany, upon return, gained prominence and respect within their American institutions when they influenced the expansion of their graduate programs to include research-based coursework and internship-type experiences (Kane, 1999). According to Kane, this was the impetus to the creation of a classification system in approximately 1920. This classification system was officially named the Carnegie Classification System of Higher Education in 1970 by the Carnegie Commission on Higher Education.

Last updated in 2015, the Carnegie system classifies institutions of higher education into eight categories based on degree levels offered and program foci. These eight basic Carnegie classifications include doctoral institutions, master's colleges and universities, baccalaureate colleges, baccalaureate/associates, associate's colleges, special focus: two-year, special-focus: four-year, and tribal colleges. Each of these eight classifications are then segregated into 33 subcategories that further distinguish the number of degrees conferred, research activity, dominant student type (traditional, nontraditional, mixed), and more discreet, discipline specific concentrations. Then, doctoral granting institutions are subdivided into highest research activity (R1), higher research activity (R2), and moderate research activity (R3).

In Fiscal Year 2015, the National Science Foundation awarded 78% of their overall grant budget to institutions of higher education. Table 2 below depicts the trend in proposals, awards, and success rates from 2005 through 2015 by the National Science Foundation (NSF). It is noted in the 2015 NSF Merit Review Report that the uptick seen in 2009 and 2010 is the direct result of the federally-appropriated ARRA funds. This explains the downturn in subsequent years (NSF, 2015, p. 9).

Table 1. National Science Foundation: Proposal, Award, and Success Rate Trends

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Proposals	41,722	42,352	44,577	44,428	45,181	55,542	51,562	48,613	48,999	48,051	49,620
Awards	9,757	10,425	11,463	11,149	14,595	12,996	11,192	11,524	10,829	10,958	12,007
Success Rates	23%	25%	26%	25%	32%	23%	22%	24%	22%	23%	24%

Note: Obtained from NSF's 2015 Merit Review Report

According to an article by Slocum and Scholl (2013) in the Fall 2013 C*ouncil on Undergraduate Research Quarterly*, the National Science Foundation has competitions designated to support PUIs. The Faculty Early Development (CAREER) awards support junior faculty with research interests in the science, technology, engineering, and math (STEM) disciplines. The Research Experiences for Undergraduates (REU) program supports PUIs with a focus on including undergraduate students as research assistants. Additionally, the Research at Undergraduate Institutions (RUI) competition restricts submission to PUIs and supports both individual and collaborative projects.

Although the NSF has the CAREER, REU, and RUI opportunities restricted to PUIs, the disproportionate success rates between PUIs and non-PUIs are problematic. From 2002 through 2012, the NSF supported undergraduate research, with $1.24 billion in competitive grant awards (Slocum & Scholl, 2013). The study completed by Slocum and Scholl (2013) found that PUIs received only 8% of all NSF awards, equating to only 4.9% of the total award amount, while non-PUIs received 92% of the awards and 95.1% of the awarded dollars. Slocum and Scholl's (2013) study utilized the criteria developed by the Carnegie Classification System to identify eligible PUIs and then compared the results with the NSF's award data from 2002-2012. After filtering for PUI eligibility and duplicates, Slocum and Scholl (2013) utilized data from 2,104 institutions of higher education meeting the PUI criteria. They then further segregated the PUIs and identified those with "substantially greater resources" (Slocum & Scholl, 2013 p. 38). The 80 institutions (3.8% of all PUIs) that were identified as having greater resources submitted 23.5% of the total PUI proposals and received over 35% of all PUI awards (Slocum & Scholl, 2013). The inequity among the various doctoral/research classifications of institutions has been a concern for some time. Kane (1999) called higher education steeply hierarchical and argued for improving and increasing the research activities at teaching institutions (PUIs). It can be posited, therefore, that the greater the resources available to PUI researchers, the more likely they will be to submit and succeed with competitive grant awards from agencies like the NSF.

It was not until the mid-2000s that the teaching-focused institutions realized the benefits of an active research faculty base. Prior to 2008, institutions were financially healthy and external research was less of a priority (Akerlind, 2008). Until the government could no longer fund institutions of higher education through federal and state allocation dollars at the levels to which they had become accustomed, there was no need for institutions to look elsewhere for

funding. The subsequent 2009 American Recovery and Reinvestment Act (ARRA) is credited for advancing an interest in grantsmanship (Waite, 2012). Billions of dollars in federal funds were allocated by the ARRA for a wide variety of initiatives that were meant to create new jobs, reinvest in the economy, and improve both the K-12 and postsecondary education. The America COMPETES Act, a supplement to the ARRA, initiated grant competitions with a small percentage of these funds for institutions of higher education who supported student engagement (Waite, 2012). The economic downturn in education and these new ARRA grant opportunities led to a realization by institutions and faculty of the significant benefits, both financially and professionally, of externally-funded grants.

Institutions of higher education have teaching (producing quality, high performing, graduates ready to enter the workforce) as their primary mission:

> The history of educational development is rooted in the improvement of teaching techniques…educational development is chiefly concerned with improving teaching practices and techniques including assessment and curriculum design; contributing to strategic policy development and implementation in relation to learning and teaching; conducting research into the student learning experience; and working in support of professional staff and student development. (MacFarlane & Hughes, 2009, p. 5).

According to MacFarlane and Hughes (2009), much of this discourse is caused by the perception that teaching and research are at opposite ends of the academic spectrum. Human Resources divisions in higher education may distinguish between teaching faculty and research faculty. Often these differences are accentuated by different salary scales and promotion and tenure requirements. Members of the two groups often occupy space in completely separate areas of a university (MacFarlane & Hughes, 2009). For those research faculty, the professional development is concentrated to their specific area, discipline, or department while professional development related to teaching is more centralized and covers a wider range of disciplines. This structure does not lend itself to inclusion and further separates the research faculty from the teaching faculty (Abraham, 2012; Austin, 1996). According to MacFarlane and Hughes (2009), this "persistent demarcation" has forced faculty to identify with or choose either teaching or research (p. 12). This current demarcation underscores the need for an institution's professional development structure to be centralized, holistic, and inclusive of teaching pedagogy and research in order to unite faculty expertise for the betterment of the students' academic experiences.

MacFarlane and Hughes (2009) attempt to transform this conviction by emphasizing the similarities between teaching and research rather than the differences:

> Dissemination of ideas to appropriate audiences is necessary for teachers in the classroom and for researchers at conferences. The skills required to give a conference presentation are similar to those presenting material to learners, including features such as clear structuring and maintaining contact with the audience. Professional requirements for teaching and research also share much in common. Both activities involve reviewing and giving feedback on the knowledge production of others whether for papers for academic journals or for student assessment. (p. 11)

Still others counter that combining teaching pedagogy and research professional development is virtually impossible and doing so hinders the interests of both parties (Boughey, 2012). The only possible way the connection between research and teaching can be made strong enough to see benefits is if the integration is systematically built into the curriculum and the class assignments. As Boughey (2012) described "An active researcher might be 'good' at research yet might not even be interested in teaching with detrimental effects on practice" (p. 630). So, unless the researcher conscientiously applies the research concepts in the classroom, Boughey believed integrating research into the classroom could have negative effects on the students' learning outcomes. Therefore, if higher education is going to encourage and support research, researchers should be taught how to teach students about the practice of research, not just the science.

Teaching the practice of learning, or cognition, is explained in the following way:

> This sort of ability is not based on knowing but rather on knowing how to know – on being able to make knowledge not as a matter of 'skill', but rather as a way of being. ... university teachers do not teach knowledge but rather *how knowledge is made* regardless of the level at which they teach. (Boughey, 2012, p. 634)

Hardre, et al. (2011) counter this belief by emphasizing the "accumulative advantage" of employing faculty who do both research and teaching well (p. 36). Supporting the development and integration of research and teaching attracts better teachers and researchers to the institution and, in turn, improves the quality of both the individual faculty member and the institution (Hardre, et al., 2011; Waite, 2012).

Understanding the benefits of and the challenges faced by faculty researchers in the competitive game of external grants is essential to building a supportive and beneficial research infrastructure (Akerlind, 2008; Bailey, 1999; Burgoon, 1988; Fitzsimmons, 2010; Waite, 2012). This global understanding recognizes the underlying goal of all academic initiatives: the integration of the faculty members' full range of ideas, experiences, expertise, and passions with the numerous ways teaching, service, and research (scholarship) interact to create the ultimate teacher-scholar (Colbeck, 1998; Simmons, 2009). Numerous studies, reports, and articles have been published providing long lists of incentives, benefits, disincentives, and challenges to external research. A focused review of literature was accomplished, narrowed to examine nonresearch-intensive, public institutions. These benefits and barriers distinctive to PUIs are summarized below.

The Benefits of Sponsored Research

Indirect costs, also referred to as facilities and administrative (F&A) costs, are the "costs incurred for a common or joint purpose benefitting more than one cost objective, and not readily assignable to the cost objectives specifically benefitted, without effort disproportionate to the results achieved" (Government Publishing Office, 2018). Indirect recovery funds are dollars received by an institution receiving an externally-funded award. The IHE, by constraints of a negotiated agreement, includes this expense to the funding agency to administer the grant funded activity. Indirect costs recovered are not profit; they are intended to reimburse the institutions for the "general" costs of the research projects and related activities.

Indirect costs recovered on external grant projects should be reinvested to support the research infrastructure. This indirect recovery has a direct impact on institutions and their faculty to support, write, and submit external grant proposals (Ware, 2006). "Consistent application of any perceived fair and equitable system will build faculty morale and confidence in the sponsored research office and the university supporting the research endeavor" (Ware, 2006, p. 17). It is essential that the perceived use of indirect funds is clear, fair, and consistently applied. Examples of investments that can be made with indirect funds include, but are not limited to, the purchase of or maintenance of laboratory facilities, equipment, and the provision of start-up funds to new researchers.

Faculty benefit financially from externally-funded grant projects, as well (Fitzsimmons, 2010; Ware, 2006). Grant funding can provide the time to commit the necessary effort in the form of course releases, summer contracts, and when appropriate, supplemental pay. Release time allows the faculty member to be bought out from a course, thus providing additional time to participate and perform research activities. Summer contracts can replace a course or provide additional compensation otherwise not available.

Additionally, external grant funds can be used to purchase high-end or specialized equipment that otherwise would be unattainable by most PUIs. This equipment can then be used to attract and retain higher quality students, faculty, and administrators. In addition to equipment, faculty often need to travel to collect their data and then present their research findings at conferences. Travel to conduct the research as well as to conferences to disseminate the results are often funded by grant dollars (Hardre, et al., 2011).

The benefits of a strong research portfolio extend beyond the individual faculty members to include students' achievements, experiences, and recruitment. External grants can fund libraries and technology and allow universities to purchase expensive, high-end laboratory equipment necessary for many academic majors, assignments, and courses. The benefits of external grants are especially crucial, considering the difficulties that some institutions currently face. As enrollment continues to decline, institutions struggle to recruit and retain students (Bailey, 1999; Buller, 2013; Hardre, et al., 2011; Waite, 2012). A quality faculty base is a cornerstone to a healthy institution and without it student retention becomes even more difficult (Ware, 2006). External grant dollars supplement the financial strains and improve the financial health of the institution (Hardre, et al., 2011).

This study identified and utilized the following three theoretical frameworks to support and explain the effects of a research infrastructure on the participation and success in sponsored research at a PUI: Etienne Wenger's Communities of Practice, Rosabeth Moss-Kanter's Organizational Support Theory, and Albert Bandura's Theory of Self-efficacy.

Communities of Practice

Wenger's (1998) Communities of Practice (CoP) is a social learning theory that supports group or team learning. Developed originally by Jean Lave and Etienne Wenger in 1991, it continues

to be further developed and more widely utilized by scholars (Wenger, McDermott, & Snyder, 2002).

Wenger et al. (2002) defined Communities of Practice as:

> groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis... These people don't necessarily work together every day, but they meet because they find value in their interactions. (p. 4)

Wenger (1998) put few constraints on CoP and intentionally allows the theory to be modified to fit the purpose. At a minimum, Wenger (1998) stated that there need to be three components required to fit his definition:

1) A domain – there has to be a commonality among the participants (teachers, researchers, athletes, gamers, etc.).
2) A community – the individuals must participate in regular activities and interact with each other. These activities can be formal or informal but they must support the domain and allow the participants to share experiences, challenges, questions, and expertise so they learn from one another.
3) A practice – the community must consist of practitioners within the domain. Individuals must not just be interested in the domain but actually work and/or practice in the field. A teaching CoP must include practicing teachers and the research CoP must include active researchers.

Members of the CoP will be motivated to be integral and central members of a group with which they share common interests and respect for the membership. This shared interest motivates, encourages, and supports the cause and, subsequently, its members. Therefore, researchers at a PUI would benefit from such a community within their institution (Wenger et al., 2002). Organized and structured by discipline, IHEs model Wenger's Communities of Practice by grouping common interests.

Organizational Support Theory

To develop effective CoPs, the institutional infrastructure must support the collective needs of the researchers. Rosabeth Moss-Kanter's Organizational Support Theory discusses how to build a beneficial and sustainable ethos of institutional support around the existing communities. It assumes that organizational leaders do not question whether or not change needs to happen but rather how to make the change happen successfully (Kanter & Brinkerhoff, 1981). Higher education leaders are no different than corporate leaders in this regard. Moss-Kanter (2006) supported the philosophy that managers need to effectively and appropriately measure effectiveness of all parts of the organization in order to best support its constituents. "Managers need to differentiate parts of organizations, to spot trouble areas, and to compare this year's overall performance to that of previous years" (Kanter & Brinkerhoff, 1981, p. 326). This understanding

of the trouble spots allows managers to allocate support (financial and strategic) to the area before it becomes truly troublesome (Kanter & Brinkerhoff, 1981). Moss-Kanter (2006) also realizes that organizations will have a variety of goals, all of which may contradict one another. IHEs often send inconsistent messages regarding the importance of both teaching and research. True effective leadership includes "the balanced attainment of many goals" (Kanter & Brinkerhoff, 1981, p. 327). Helping faculty balance their teaching with their research is essential in developing the knowledge, skills, and attitudes that promote and produce a successful research portfolio at a PUI.

In addition to the imbalance between teaching and research, IHEs fall subject to complex and sometimes inconsistent leadership. Academia has been described as an "organized anarchy" due to its multi-level substructures of colleges, departments, units, and complicated hierarchy (Kanter & Brinkerhoff, 1981). Leaders must ensure that all colleges, departments, and units measure effectiveness in the same way and that goals at all levels are defined and accepted by all involved. To account for this imbalance and develop effective support structures, Kanter (2006) suggested addressing three bottlenecks: 1) theoretical bottlenecks—make sure people know how to do the task (research); 2) resource bottlenecks—make sure people have the resources required; and 3) organizational bottlenecks—make sure people can put the resources together. To mitigate the "organized anarchy" and address the bottlenecks in the realm of research in higher education, leaders must provide adequate and appropriate professional development to ensure faculty have the knowledge to perform research. They must then ensure the appropriate resources are available (adequate laboratory space, policies, procedures, and a research infrastructure). Empowering the stakeholders involved in the research endeavors to create a robust, communicative, and viable research enterprise that stimulates a balance between teaching and research is the ultimate goal. Hardre et al.'s (2011) study found that faculty prioritize their personal research projects in the same way the institution establishes their tenure and promotion processes. If the institution puts more weight on teaching expectations and student evaluations, that is where the faculty will devote the majority of their time. This inequity in worth is at the detriment of the research portfolio (Hardre et al., 2011). Finding a manageable balance among teaching, research, and service must be a priority of administration.

Moss-Kanter (2006) stressed confidence as the primary factor in success in any field. Confidence is defined as: "... the bridge connecting expectations and performance, investment and results" (Moss-Kanter, 2006, p. 3). Confidence in self, colleagues, leaders, and the overall structure are imperative for continued participation and success. Researchers must have confidence in their own abilities, believe in the importance of their research topic, and be assured that their leaders and infrastructure will support them in their quest.

To develop confidence in research and the researchers, administrators should invest in the researchers' expertise and the research infrastructure. According to Moss-Kanter (2006) "confidence influences the willingness to invest—to commit money, time, reputation, emotional energy, or other resources—or to withhold or hedge investment. This investment, or its absence, shapes the ability to perform" (p. 7). Researchers who have leaders who believe in their abilities

enough to invest precious institutional resources are more likely to invest their own precious time to achieve the institutional goals. Moss-Kanter (2006) also addressed the problem of relying too heavily on just a few active researchers. She uses the analogy of a sports team relying on just a few superstars. When the superstars get hurt or retire, the team scrambles to replace their talent. Relying on just a few individuals to carry the team, or the research enterprise, is sabotage to the rest of the team. Not only does leadership need to invest in the current researchers but they need to develop new researchers at the same time:

> Winning on the playing field is influenced heavily by what goes on off the field—the nature of the system to attract people, develop people, build bonds among team members, gather external support, and do all the other behind the scenes work, before and after each game, before and after each season. (Moss-Kanter, 2006, p. 24)

Investing in the researchers and showing recognition and thanks for their efforts will maintain and grow the research enterprise. "Leaders of high-performing organizations don't count on impulse or emotions alone to produce the behavior of winners. They establish disciplines and embed them in formal structures" (Moss-Kanter, 2006, p. 47). Informed decisions and proven best practices in grantsmanship will allow leaders to use their limited resources in the most cost-effective and beneficial ways.

Theory of Self-efficacy

There has been much discussed on the knowledge, skills, and abilities of faculty to perform research. Albert Bandura's Theory of Self-efficacy is a relevant framework for this study because it defines an individual's ability (or inability) to perform certain tasks (in this case, research) successfully. Self-efficacy, defined by Bandura and cited in Weibell (2011), states:

> People's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives" and is considered a theoretical framework "in which the concept of Self-efficacy is assigned a central role, for analyzing change achieved in fearful and avoidant behavior. (Chapter 3)

People who possess positive self-efficacy have the following characteristics in common:

1. They see difficult or new tasks as challenges (not threats or obstacles).
2. They intentionally set goals that are challenging and outside their comfort zone.
3. They use failure as motivation and maintain a commitment to achieving their goal(s).
4. They see failure as inadequate effort or lack of skills that can be overcome.
5. They acknowledge fear or hesitation with the difficult (or threatening) task but are confident in their ability to succeed. (Weibell, 2011, Chapter 3)

To account for these characteristics, Bandura identified four factors that influence our level of self-efficacy: 1) prior accomplishments or experiences, 2) vicarious experiences, 3) persuasion,

and 4) physiological and emotional states.

Bandura (1986) argued that succeeding personally with a task that was originally viewed as difficult or threatening is the best way to build self-efficacy and confidence in your ability to grow in a particular area. Seeing others succeed or master skills desired increases your confidence and develops a stronger interest and commitment to the task at hand. External or social persuasion is another strong aspect of one's level of self-efficacy. The power of persuasion is stated this way: "People who are persuaded verbally that they possess the capabilities to master given activities are likely to mobilize greater effort and sustain it than if they harbor self-doubts and dwell on personal deficiencies when problems arise" (Weibell, 2011, Chapter 3). The final characteristics, one's physiological and emotional states, are inert traits that are more difficult to explain. Although self-efficacy has little or no effect on one's physiological health, Bandura insisted that those with higher levels of self-efficacy view their health challenges as less impactful and work harder to overcome these challenges:

> Inasmuch as a person has both the component skills needed to succeed, and the incentive to engage, Self-efficacy plays an important role in determining what activities a person will choose to engage in, how much effort they will expend, and how long that effort will be sustained when things get tough. (Weibell, 2011, Chapter 3)

This quote and Bandura's Theory of Self-efficacy epitomize the benefits of a solid research infrastructure that provides professional development opportunities and resources. The more faculty that are prepared, understand, and have the knowledge needed to succeed in grantsmanship, the more likely they are to succeed early in their career. Not only is this early success dependent upon adequate preparation and training, but it will further strengthen the self-efficacy levels and interest in continued participation in external research (Sterner, 1999).

Bandura's Theory of Self-efficacy is consistent with and supports Wenger's (1998) communities of practice as it suggests teamwork and continuity with colleagues possessing similar interests. Moss-Kanter's (2006) Organizational Support Theory further enhances the administrators' ability to develop and implement strategic and focused resources.

These theories, collectively, support the overarching implications of academic leaders' commitment and explicit support of faculty research endeavors. To assist faculty in reaching the highest level of efficacy, administrators should recognize faculty at all stages of development and for all the efforts expended, not just the successes achieved. Proposal submissions should be recognized as well as awards received because extending appreciation for the attempts (proposals submitted) will encourage researchers to keep trying. This recognition for effort will equate to a more robust, stable, and successful research portfolio (Hardre et al., 2011; Waite, 2012).

Although literature and studies exist that identify priority needs and desires of researchers, there is no research that identifies best practices in research support specifically for a PUI. This study will bring to light the untold stories and perceptions of the various key stakeholders at a high-performing doctoral granting PUI. It also will identify linkages between and among the various

stakeholder roles, goals, obstacles, and research outcomes.

The purpose of this study was to analyze and develop an in-depth understanding of the characteristics of an R3, PUI with a high-performing externally-funded research portfolio. During Fiscal Year 1617 (FY1617) (July 1, 2016 – June 30, 2017), a known R3 and predominantly undergraduate institution received approximately $14,000 per faculty member in federally funded research and serves as the "base" institution. This study, therefore, examined an R3, PUI with a research portfolio that exceeded $30,000 in federally funded research per faculty member in FY1617. This site institution contradicts, in many ways, the stereotypical characteristics of a PUI described above.

This study examined the myriad of resources and support that the purposefully selected institution of higher education provides in research and scholarship. It then analyzed the outcomes and identified the characteristics and aspects of the successful model. Specifically, it identified the perceptions and attitudes regarding infrastructural resources in support of research endeavors. The results of this study will help doctoral level PUIs strengthen their faculty scholarship base, develop a more efficient, cost-effective, and robust infrastructure, and increase their externally-funded project portfolios.

The central phenomenon that was studied was the overarching research infrastructure and attitudes as reflected in 'confidence'. The various component parts and the way in which they work together to support and promote research are central to this study. Researching such structures can provide exemplar models that can be replicated by other PUIs seeking to increase their research footprint.

Research Questions

The research questions of this qualitative study include:

1. What are the characteristics of an R3 PUI with a successful external grants portfolio?
2. What do faculty identify as priority resources needed to support a successful grants portfolio?

The purpose of the research questions and the in-depth, qualitative, focus group interview structure was to extract the perceived details, characteristics, support mechanisms, and infrastructure that promote and support participation and success in external grantsmanship. The perceptions of all key individuals and offices were integral to understanding and analyzing the high performing institution.

This study is based on three influential frameworks that all provide mechanisms for developing expertise, confidence, self-efficacy, and success. The basic principles of Ettiene Wenger's Communities of Practice, Rosabeth Moss-Kanter's Organizational Support Theory, and Albert Bandura's Theory of Self-efficacy will be applied to participation and success rates in externally-sponsored research. These theories will be integrated into the anecdotes and responses provided by the participants to frame an effective, cost-efficient, and successful research infrastructure.

Methods

The institution identified for this study was purposefully selected because it is a PUI with a research portfolio of an R3, boasts more than $30,000 in federal funding per faculty member, and is demographically similar to the base institution. The site institution employs approximately 400 tenure/tenure track faculty with an enrollment of nearly 15,000. The academic offerings are characteristic of a PUI as it does not house a medical or engineering school. To identify and analyze the selected high-performing institution's sponsored research portfolio and research infrastructure, a qualitative case study design was used.

A case study was the appropriate method of research for this project, as Creswell (2013) stated:

> Case study research is a qualitative approach to which the investigator explores a real-life, contemporary bounded system (a case) .... Over time, through detailed, in-depth data collection involving multiple sources of information (e.g., observations, interviews, audiovisual material, and documents and reports) and reports a case description and case themes. (p. 97)

The intentional use of the case study approach enhanced the rigor and credibility of the research design (Creswell, 2014). The case study approach used was the single instrumental case study. This type of case study focuses on a specific issue or phenomena and selects a single bounded case to research (Stake, 1995). The selected institution of higher education is a prime example of a single instrumental, bounded case study.

To expound upon the phenomenon of a high-performing PUI, this case study included focus group interviews, follow-up interviews, review of artifacts, and researcher observations. Multiple semi-structured focus group interviews, follow-up interviews, and analysis of relative artifacts provided beneficial insight and an in-depth understanding of the components of the research portfolio at the site institution. The survey questions were reviewed by a qualitative researcher and two pilot interview sessions were conducted with active researchers at the base institution.

The research site institution's Office of Sponsored Research served as the initial point of contact and assisted in locating relative artifacts and in identifying members of the core group. The researcher obtained e-mail addresses of individuals meeting the criteria for this study and communicated directly with each potential participant via e-mail and telephone. Three days on-site immersed in the research infrastructure were needed to complete the data collection.

Semi-structured focus group interviews were scheduled at the convenience of each participant. Due to various schedules and availability of participants, several sessions were needed to obtain adequate representation and participation. Fifteen (out of an estimated 150 possible) active researchers were interviewed. Only researchers active in externally competitive grants were included and the general pool was identified by the Office of Sponsored Research. The interview questions gathered information on existing professional development resources for faculty, desired and prioritized resources, perceived challenges, and incentives to grantsmanship. Follow-up interviews were offered to all participants of the focus groups and were scheduled at the

convenience of both the interviewee and the researcher. The follow-up interviews were done via Skype, telephone, or e-mail at the discretion of the interviewee. The follow-up interviews allowed interviewees to expand upon discussions, provide additional information, and add descriptive details to the previous conversations. This additional information provided more depth and meaning to the results and allowed for a more acute analysis. Follow-up interviews also provided the researcher the opportunity to ask follow-up questions based on information gathered from all core groups and revisit ideas or themes that were identified by previous groups.

Participation in the focus group interviews was completely voluntary. Participants had the ability to cease participation in the interview(s) at any point. In the event a participant ceased the interview, no data from that resource was utilized and they were not included in the participation numbers or rates. Ensuring the participants confidentiality was of primary concern throughout the process. While the Office of Sponsored Research identified the pool of candidates, the respondents and the scheduling remained confidential to administration. To further ensure confidentiality, the interview space was across campus from the administrative and sponsored research offices and pseudonyms are used throughout for both the participants and the site location.

To ensure integrity of the responses, the interviewer audio-recorded the interviews and the responses were transcribed. The transcriptions were offered to the participants for member-checking. To ensure that the data and the participants remain confidential, the verified transcripts were stripped of all identifiable data and saved both electronically and hard copy. The original data recordings, the redacted transcriptions, and any researcher notes were saved in separate electronic and physical locations.

Physical documents and artifacts appropriate to this study were secured from the Office of Sponsored Research. Examples of physical documentation include research administration policies and procedures, researcher handbooks, relevant sections of faculty union contracts, relevant compensation policies or regulations, research administration handbooks, professional development resources, and sponsored research portfolio reports. Each artifact was reviewed and notations made for the relevant sections, topics, and facts.

The data collected were coded and analyzed using NVivo software. The researcher developed a codebook and each datum point was entered, resulting in the identification of themes. The complete transcriptions, snippets of the recorded interviews, excerpts from the physical documents, excerpts from follow-up e-mails, and the researcher's personal observation notes were included as nodes in NVivo.

Research Participants

The initial focus groups included 11 researchers while an additional four researchers, not available at the time of the on-site interviews, responded to an invite for one-on-one sessions or follow-up telephone/Skype interviews. These additional four telephone/Skype interviews brought the active researcher participation to 15. Three of the initial 11 participants responded to the invite for a follow-up interview and participated in subsequent telephone calls and/or e-mail

communication.

The participants can be further categorized into seven male and eight female faculty, six of whom consider themselves senior researchers. Four classified themselves as junior researchers while the remaining five placed themselves somewhere in the middle. These data were self-reported, and it was made clear to the researchers that classifying themselves as junior or senior researchers should have no correlation to their faculty (assistant, associate, or full professor) position. Interview questions and observations allowed for the differentiation of the results by rank, gender, and confidence level. Table 2 below summarizes the 15 researchers' demographics.

Table 2. Active Researcher Study Participant Demographics

Gender	Rank as a Researcher (self-reported)	Confidence Level in Securing (self-reported)	Confidence Level in Managing (self-reported)
F (8)	Jr Researcher (3) Sr Researcher (3) Middle (2)	Jr & High = 1 Jr & Neutral/Low=2 Sr & High = 1 Sr & Neutral/Low = 2 Mid & High = 1 Mid & Neutral/Low = 1	Jr &High = 2 Jr & Neutral/Low = 1 Sr & High = 1 Sr & Neutral/Low = 2 Mid & High = 0 Mid & Neutral/Low = 2
M (7)	Jr Researcher (1) Sr Researcher (3) Middle (3)	Jr & High = 1 Sr & High = 0 Sr & Neutral/Low = 3 Mid & High = 2 Mid & Neutral/Low = 1	Jr & High = 1 Sr & High = 3 Mid & High = 3

Results

Although the literature is saturated with information on research success at research-intensive institutions of higher education, little literature exists about research at institutions with a large undergraduate population. By exploring a high-performing R3 PUI, characteristics, themes, best practices, and faculty perceptions were identified. The results of this study help mitigate the disparity in the literature between research-intensive institutions and PUIs. These data can be used by PUIs to strategically support research and scholarship thereby developing a larger research base.

The results of the interviews are organized by the two research questions this study was designed to answer. The first reveals the characteristics of the site institution as reported by researchers interviewed, personal observations, and review of archival data. The second identifies and explains the resources and support opportunities available. Integrated within the two questions are the primary themes and beliefs that emerged from the analysis. Themes are further distinguished,

where appropriate, by gender, research classification (junior or senior level) and confidence levels. Research classification and confidence levels are self-reported data. The aggregate data, as collected, is shown in Table 3. Several subthemes are integrated throughout to expound upon and better articulate the beliefs of those interviewed. The stories told are meant to capture the culture of the research infrastructure and all those encapsulated within it. For the sake of confidentiality, pseudonyms for the institution and the individuals interviewed are used.

Research question number one, "What are the characteristics of an R3 PUI with a successful external grants portfolio?" addressed the overall characteristics of the research infrastructure. The characteristics that were perceived to be fundamental to the ability, desire, and success of university researchers include a positive relationship with the office of sponsored research and research administration team, the support and ability to utilize graduate students, the impact of research on tenure and promotion, a continual increase in the expectation to participate in research, genuine gratitude for early-career support and a desire to give back and support the reputation and growth of the institution.

All 15 researchers interviewed were adamant that they could not "do what they do" without the Office of Sponsored Research. Without exception, each researcher was extremely positive about the support and the relationships with the Office of Sponsored Research staff and leadership. Because the question was not asked, it is essential to note that each interviewee volunteered gratitude and respect for the staff members in the Office of Sponsored Research and the leadership. Many comments were made about the extensive efforts and kindness exuded by the entire research administrative team. Four of the researchers commented specifically on the office's ability and desire to help researchers turn "fuzzy ideas" into fundable, coherent grant proposals. The respect for the Office's knowledge and expertise with funding agency guidelines, submission requirements, and budgetary guidelines was expressed by seven faculty, but observable agreements were made by all. One faculty member expressed it this way:

> There is a culture of gratitude here that many of my faculty friends at research intensive universities don't have. Our leadership is sincerely thankful for what we do, and they are always trying to support us in whatever way possible. We could not do what we do without them.

Because faculty (even the top researchers) are teacher-oriented, finding ways to balance teaching with research is essential to the overall success of both activities. Including students in their research projects is one of the best ways to accomplish this balance. The majority of the faculty confirmed that they often include students as research assistants on their research projects. One of the more seasoned researchers and a self-reported senior researcher explained why they feel research is an important part of academia:

> If our research doesn't benefit students our work is going to vain, right? I teach Intro to Research and being able to say 'here is a research project I did that illustrates X and here's another research project that illustrates Y gets the students more involved and the class just seems to go better.

Those who indicated that they do not include students in their research projects cited the lack of graduate programs in their discipline as the primary reason. It can be inferred, therefore, that graduate programs strengthen the inclusion of students on research projects and further support faculty research activity. Faculty agreed that it would be beneficial if administration would support a restructure of the graduate assistantship distribution model to equalize the support across the institution, including those disciplines with only undergraduate programs.

Teaching, service, and scholarly activity are the three tenets of tenure and promotion within academia. Research, funded or unfunded, falls within the definition of scholarly activity. Tenure and promotion was a topic of discussion in all three of the focus groups. A question addressed the importance of research on the tenure and promotion process. While everyone agreed that grant awards are a consideration of tenure, the weight allocated was not clear. Many of the participants felt the dollar value of the award and the prestige of the funding agency made a difference to the committee. One researcher, looking at a colleague, stated: "My $10,000 award from an unknown agency does not hold as much weight as the $500,000 award from, like, NSF that someone in your department recently got. It's more about the prestige of the grant and the agency than the effort and success."

Without exception, the faculty expressed strong desires for a better and consistent understanding of the value of grants as a factor determining tenure and promotion. Although not unanimous, there was a noticeable belief that attempts (proposals submitted but not funded) are not considered equally (or at all) for tenure and promotion. There was consensus among all participants that a more consistent and clear understanding of the weight held by both unsuccessful grant proposals and awards would be beneficial.

While the tenure and promotion criteria vary among the disciplines at the site institution, there is a clear understanding that research is an expectation of all faculty. Based on responses received, leadership has been successful in communicating this message. Thereby increasing the prestige, accountability, and recognition of research. All participants thought that the institutional leadership is extremely supportive and recognizes the efforts put forth and the overarching challenges faced by active researchers. There was a unanimous desire for the criteria to be more standardized among all disciplines for clarity and consistency.

Because of the strong expectation to participate in research, all faculty are offered an ongoing three-credit course release each semester to stay engaged and active in their research. Undergraduate programs offer faculty a three-three load and graduate programs provide a two-two load. This course release for research is ongoing throughout the faculty member's academic career and is in addition to other course releases such as serving as departmental chairperson. This course release is intended to allow the faculty to start, maintain, or increase their efforts in their personal research agendas. There is no requirement that the research be externally funded but outcomes are a clear expectation. If a faculty member does not produce, they are eventually required to increase their teaching load. The decision to rescind the course release is at the discretion of the academic chairperson and/or college dean. Faculty are given the resources, the support, and the encouragement to participate in external research, but they are also given the option to not take

advantage of these opportunities and focus solely on teaching.

The pressure to secure external funding at this institution has increased over the past ten years, evidenced by the responses of the faculty. Faculty reported more communication from the Office of Sponsored Research, more recognition of proposals and awards, and overall increased attention on funding opportunities. This comment by a faculty researcher received nods of agreement and consensus within the focus group: "I really get the impression that across the university the pressure to research has increased a lot and we are on an upswing around the pressure to do research and bring in external funds and to publish the results. Whereas we used to be more teaching focused."

Some of this top-down change was credited to the current research leadership having firsthand knowledge of the challenges faced by researchers. The top three administrators, collectively, have countless external grant projects on their Curriculum Vitae. According to one faculty, "Having leadership that actually understands what it means to apply for an NSF grant and how to do that and giving me the kind of support that is needed is extremely helpful."

The participants communicated immense gratitude for the support received at the beginning of their careers. Strong belief was expressed that the early support enabled them to continue and eventually be successful in securing external funds. One participant's remark caused chuckling agreement in one focus group: "I see support not just if you're getting that funding, but if you're going after it, even. I think that gets you these little gold stars on your chart on the refrigerator that you can build up to trade in for some ice cream."

Interviewees participated actively in a conversation about the way in which start-up funds are provided to faculty. Several noted that they could have accepted faculty positions at more "research prestigious" institutions but that they appreciate the more consistent and patient support received. This comment by a researcher sums the sentiment well:

> I think of us as a little different compared to some other universities where I have other colleagues. A lot of those places you're going to come in and they'll throw you this big start-up package on the front end and say, 'All right, I supported you now go for it'. It's different here. You prove yourself a little bit and then once they see that you are committed to that research culture, then you start getting more and more benefits. It then snowballs.

Although support is important, research has concluded that confidence influences the desire, willingness, and success potential with everything individuals attempt to accomplish (Moss-Kanter, 2006).

Overall, only 37.5 % of females considered themselves confident in both securing and managing a grant, while 43% of the males ranked themselves as confident in securing and 100% were confident in managing the grant. The observable behavior that elicits a stronger understanding of this data is that the female participants took more time to answer and seemed to think about their responses much more than the male participants. While most of the focus groups were of mixed-genders, one was comprised of all female participants. This group spent an inordinate amount of

time deliberating their confidence levels. There was extreme uneasiness about ranking themselves and some changed their minds several times during the conversation. A follow-up interview with a female participant provided a heartfelt explanation of her struggles and how she feels they differ from her male colleagues. She summarized her perception by saying:

> I would have to say that as a woman, I have been very challenged by the need to balance life and profession. So, by default, I cannot have the motivation and time that the men have. Nor do I have the professional strength (we are not Stanford after all). So, I can only do that much in research. On the other hand, most of the rules in academia are set from the point of view of the 'male warrior'. I had to prove myself much more than my male counterparts as I was working on my tenure and promotion. And although I reached full professor, I feel that I am not in the right crowd. My interest is more in having a good work environment rather than reaching high level research goals that have eluded me so far and have consumed most of my professional time to the point of exhaustion and sickness. At this time, I am protecting myself and my health by saying NO a lot more than I used to. I would rather spend my time on my strengths rather than my weaknesses in terms of profession.

This individual was the only female participant in her original focus group and communicated thanks when given the opportunity for a follow-up interview and the ability to voice these considerations. This researcher expressed passion and frustration with the lack of understanding from her male colleagues. Although only expressed by one researcher, it is important to note the significance and passion that was noted in her voice. The fact that she was unwilling to share her feelings of frustration during the focus group is extremely telling. It would be beneficial to expand on this topic with faculty researchers.

The male participants, on the other hand, seemed sure of their responses to both parts of the question and did not deliberate or expound upon their answers. The reasons for their answers differed in context as well. The female participants cited personal reasons for their answers, while their male counterparts cited the current funding climate as a reason to not be as confident in their ability to secure a grant. One male participant said it this way:

> To write and secure grant, I'd say I'm neutral. Some of that is based on individual abilities, but the secure part is partly, probably a lot, based on the funding climate and that really provides uncertainty no matter even with an established research agenda.

Table 3 provides a visualization of the self-reported confidence levels in writing and securing and managing an external grant by gender.

Table 3. Researcher Gender Differences by Confidence Level

Gender	Confidence in Writing/Securing	Confidence in Managing
F = 8	Mid/High = 3 (37.5%)	Mid/High = 3 (37.5%)
M = 7	Mid/High = 3 (43%)	Mid/High = 7 (100%)

The comparison of the researcher classification (junior versus senior) and confidence levels in securing/writing and managing a grant is interesting, as well. Only one in six senior researchers reported being at least confident in writing/securing while four in six felt confident managing the grant. Two of four junior researchers reported feeling confident in writing/securing and three-fourths are confident in managing the grant. The neutral researchers reported confidence by three of five respondents in both writing/securing and managing. Therefore, six out of the 15 (or 40%) reported high levels of confidence in writing/securing and ten of the 15 (or 67%) reported high confidence in managing the grant once awarded.

This group of researchers epitomizes the definition of a teacher-scholar. The consistent and unanimous desire to use their research to influence their teaching and their teaching to influence their research is impressive. The overarching support network at this institution includes the researchers, the sponsored research staff, and the leadership. The collaboration among these groups is a factor in the success of this institution's grants portfolio.

The second research question, "What do faculty identify as priority resources needed to support a successful grants portfolio?" identified the resources and skill sets active researchers feel most essential to research success. The resource identified to be essential at this institution is intangible and somewhat obscure. The collective comments from researchers revolve around the feeling of support and understanding of their needs by leadership and is an immeasurable piece of the infrastructural support. The anecdotal stories and examples provided by researchers all point to the culture of respect and gratitude for the efforts in support of external research.

A question that addressed the key skills felt to be essential for success in external research received very specific answers. After very little thought or deliberation, the faculty participants identified the following as their collective top four key skills needed for success in grantsmanship. Each of the four skills were stated by a minimum of three separate individuals participating in the active researcher groups.

1. Time Management/Ability to Prioritize
2. Known Expertise/Publications
3. Perseverance/No Fear of Rejection
4. Collaboration

Time management and the ability to prioritize among all of the tasks on the "to do" list was identified by all researchers involved in this study as the top most beneficial skills. Regardless of the teaching load reduction available, time remains constant. One researcher explained the need for both time management and prioritization: "What has priority and what's urgent don't always match up. Because this one thing HAS to be done today because it's urgent, or at least it seems urgent, but it may not have as big an impact and be as important as this other thing. You need to be able to manage your priorities in terms of urgency and impact all within the same time frame."

Researchers also identified expertise as a necessary skill. Expertise should be proven with a history of publications and prior relative research. A faculty researcher with some self-reported success said: "You're being hired because of what you know and/or your ability to find it out. I think I have a good reputation and people know in certain areas that I have something credible to say. That has certainly helped me a lot." A researcher with minimal success in external research stated her need to participate more in scholarly activities to build her credentials this way: "I think part of the reason I have not been as successful is that I don't have the reputation in the field. I need to submit for a small internal grant that will allow me to gather some data and get some publications or presentations. Then, maybe I'll be more successful."

Agencies are more likely to fund proposals by researchers with experience and expertise in the discipline. Researchers can gain credibility by conducting preliminary or pilot research and publishing the results. Institutional resources are often used to fund the collection of pilot data to build the researchers confidence and credibility.

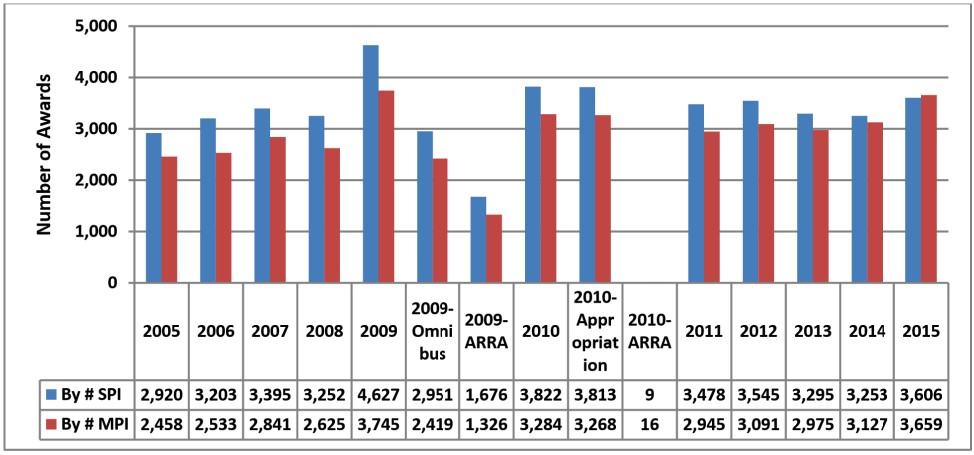
The third most popular skill believed to be integral to a successful research career is perseverance. The success rate with competitive (federal) grant proposals is, at best, 34% (NSF, 2015). This statistic includes all proposal submissions by faculty at all levels of their careers and from a wide variety of institutions. Being told "no" is common in grantsmanship because of the competitiveness. Researchers must become accustomed to unsuccessful proposals and be willing to look closely at the feedback provided and integrate the comments into a revised re-submission. One researcher cleverly associated the determination with that of writing one's dissertation:

> It's just the determination. Like we all did in our dissertations. You're going to wrestle that damn thing to the ground before it kills you. Just never give up on your idea. You submit a proposal to an agency, they give you feedback, and you make the changes they want and resubmit it again and again until you get it right.

This determination was evident in review of the sponsored projects reports that indicated a high percentage of resubmissions of the same grant proposal over the course of several years. A member of the leadership also stated that the role of the Sponsored Research Office is to review feedback provided by the grant reviewers and assist the researchers in addressing the feedback and improving the quality of resubmissions.

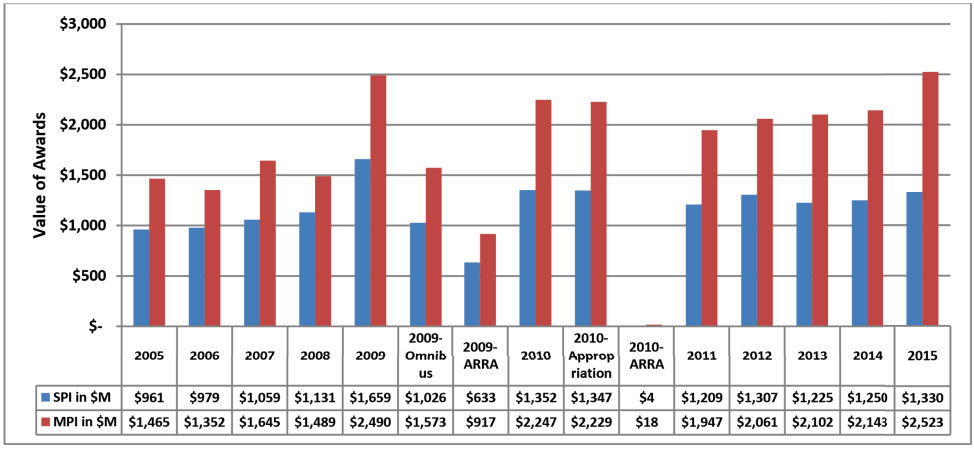
The fourth most important skill perceived to be integral to grantsmanship success is collaboration. Collaboration was also addressed by the National Science Foundation. Collaboration with other researchers and/or other entities produces a more competitive proposal. No one individual, regardless of how intelligent and how hardworking, can be an expert in every area, discipline, or activity. If researchers want to be successful with a large, complex grant proposal, they must ensure that they have the capabilities in place to perform the myriad of required tasks. While collaborations were always encouraged, this greater emphasis on collaboration, as cited by the NSF (2015), is fairly new. In 2015, NSF, for the first time, made more grant awards to collaborative or partnership efforts. The value associated with the multi-authored awards greatly surpassed the single-authored awards by more than $1 billion. This difference is significant enough to warrant

the push to collaborate with colleagues. Figures 1 and 2 below provide citation and additional detail from the NSF.



	2005	2006	2007	2008	2009	2009-Omnibus	2009-ARRA	2010	2010-Appropriation	2010-ARRA	2011	2012	2013	2014	2015
By # SPI	2,920	3,203	3,395	3,252	4,627	2,951	1,676	3,822	3,813	9	3,478	3,545	3,295	3,253	3,606
By # MPI	2,458	2,533	2,841	2,625	3,745	2,419	1,326	3,284	3,268	16	2,945	3,091	2,975	3,127	3,659

Figure 1. NSF research projects with single PIs (SPI) & multiple PIs (MPI), by number. From NSF Enterprise Information System, 10/01/15. Note: In FY2010, a total of only 25 research projects were funded from the ARRA appropriation (including one collaborative project). These are barely visible in the figure.



	2005	2006	2007	2008	2009	2009-Omnibus	2009-ARRA	2010	2010-Appropriation	2010-ARRA	2011	2012	2013	2014	2015
SPI in $M	$961	$979	$1,059	$1,131	$1,659	$1,026	$633	$1,352	$1,347	$4	$1,209	$1,307	$1,225	$1,250	$1,330
MPI in $M	$1,465	$1,352	$1,645	$1,489	$2,490	$1,573	$917	$2,247	$2,229	$18	$1,947	$2,061	$2,102	$2,143	$2,523

Figure 2. Research projects with single PIs (SPI) & multiple PIs (MPI), by dollar amount.

Conclusion/Summary

As institutions of higher education across the country continue to struggle with financial stability, PUIs must continue to seek ways to supplement the declining tuition revenue, recruit, and retain high-performing students and faculty (Bailey, 1999; Buller, 2013; Hardre, et al., 2011; Waite, 2012). Developing the credibility and expertise of researchers will aid in increasing the success rate of externally-funded research and provide additional revenue to the institution. Research has suggested that institutions and administrators who have faculty who feel prepared, are well-positioned, and have the infrastructural support needed are more productive and more successful (Akerlind, 2008; Hardre et al., 2011; Waite, 2012). The greater the resources available to researchers, the more likely they will embrace the teacher-scholar role and, therefore, become more active and more successful with external funding (Akerlind, 2007; Kuh, Chen, & Laird, 2007; Ware, 2006). Now is the time for institutions, especially PUIs, to formalize and implement a strategic plan for the future of their research endeavors.

This institution's research infrastructure reaffirms the ideals established in the three frameworks used to structure this research study. Leadership emphatically confirmed that they are placing more weight on the research expectations of all faculty, including using research experience as a factor when selecting new faculty hires. The more faculty with the interest, expertise, and credibility in research endeavors, the stronger the research Community of Practice. Since the principle foundation of a CoP is one of commonality, the more faculty with similar interests, needs, and potential, the stronger the shared voice will be to advocate for additional resources and increase the credibility, reputation, and notoriety of the research base.

Moss-Kanter's Organizational Support Theory builds an ethos of institutional support around these CoPs. Organizational support, to be effective, must address the needs of the community it intends to support (Moss-Kanter, 2006). Therefore, having leaders who understand the needs, challenges, and motivations behind external research is critical. It was evident from the interview results that researchers have a strong level of respect for the leadership and that leaders use their personal experiences to drive a successful support network.

The leadership's recognition of the challenges faced, and the success achieved by the researchers support Bandura's Theory of Self-efficacy. Bandura defines his Theory as "people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives" (1986, p. 391). Bandura found four factors that influence our self-efficacy or confidence: prior accomplishments, vicarious experiences, persuasion, and physiological and emotional states. The leadership works diligently to support the researchers both financially and psychologically. There is a strong culture of understanding, respect, and confidence in the abilities of both the researchers and the research infrastructure that promotes success. The institution studied ensures that all research efforts are recognized, rewarded, and promoted within the institution.

The institution chosen for this study embraces these ideals and have found creative ways to eliminate the common PUI barriers and compete, quite successfully, with the research-intensive

institutions. The researchers described a culture in which the leadership intentionally and strategically commit institutional resources that encourage research while building the capacity of both the researchers and the research infrastructure. The results revealed a cohesive infrastructure with high levels of mutual gratitude and respect among the diverse groups of individuals and entities that constitute the research infrastructure.

Although the culture at this institution epitomizes success, there is, still, room for improvement. Faculty participants in this study identified the following as recommendations for improvement:

1. A more consistent method of evaluating research (proposals and awards, regardless of success) among all disciplines, departments, and colleges for tenure and promotion purposes.
2. A better, more strategic and inclusive use of graduate students, especially to those majors without graduate degree programs of their own.
3. More clarity and understanding of the repercussions if the course release provided for research is not utilized.
4. Additional professional staff housed in each of the academic colleges to more effectively assist researchers in the development and execution of their research agendas.
5. A formalized mentorship program, customized for research and scholarly activity, to further engage and support research success.

The single and probably shortest comment of all the interviews summarizes the impression received while performing the interviews, interacting with the university community, and subsequently, analyzing the results: "We have a pretty good gig here." The collective efforts to support research, funded and unfunded, is immense and strategic at this institution. Another comment epitomizes the basic human need of recognition: "There is a culture of gratitude here… Our leadership is sincerely thankful for what we do."

The leadership at this institution embodies the definition of transformational leadership by utilizing their personal experiences and knowledge to create positive change, motivate and encourage, and build confidence among their researchers. In addition, the leadership recognizes the need for continuous change and improvement of the research infrastructure and actively acknowledge, seek, and act on the needs of the research community.

Author's Note

This article is derived from the author's doctoral dissertation research study completed June, 2018.

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