

Rebuilding the research enterprise of a historical research intensive college of nursing

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ABSTRACT

Background: Maintaining a productive research enterprise within a college of nursing is multifaceted and complex. It is especially challenging when a college's mission transitions to address other priorities, and later attempts to re-emerge in the competitive funding environment and re-establish a productive research portfolio.

Purpose: To describe how a college is rebuilding the research enterprise to meet the established research mission after a decade of marginal research productivity.

Strategies: Targeted multi-level strategies at the university, college, and individual levels are being implemented to enhance the research infrastructure and faculty capacity to increase research productivity.

Impact: In the past five years, compared to the previous five years, annual faculty publications have doubled, annual extramural funding per tenure track faculty increased by 72%, and the College's average extramural sponsored award funding per year increased 118%. National Institutes for Research rankings moved from no ranking (2013) to top 31 (2017).

Discussion: Early results are positive and efforts to maintain and further grow the research enterprise will require sustained effort to meet ongoing challenges.

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Maintaining research intensive environments in colleges of nursing is challenging at best. Over the past 10 to 15 years, there has been a perfect storm impacting research funding, compounded by extrinsic and intrinsic forces within colleges of nursing, universities, and the discipline.

At the forefront of these challenges is the increased competition for colleges of nursing seeking federal funding (Kerr, 2016), despite decreases in National Institutes of Health (NIH) and other federal funding sources (American Association for the Advancement of Science, 2018). Costs for recruiting and maintaining highly productive research faculty require significant investments,

and academic institutions are facing their own financial limitations (Berkowitz, 2015; Kulage et al., 2015). With rapidly increasing doctor of nursing practice enrollments (Smeltzer et al., 2016), and escalating retirements among senior nursing faculty (American Association of Colleges of Nursing, 2018a), teaching workload requirements often compete with faculty research productivity (Smeltzer et al., 2014). Targeting nurse faculty hires with programs of research that may align with the National Institute for Nursing Research (NINR), and other federal funding priorities, creates another challenge. The National Institute for Nursing Research (NINR) has clearly delineated their research priorities into four focus

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areas of nursing science: (1) symptom science, (2) wellness, (3) self-management, and (4) end of life and palliative care, with additional emphasis on promoting innovation and innovative strategies for research careers for 21st century nurse scientists (NINR, 2018).

Despite funding challenges, the need to increase impactful discoveries and evidence-based practice that improve health outcomes for the populations we serve is at the forefront of our profession. Supporting faculty in their scholarship, teaching and service for a prolific, and rewarding academic career, while meeting the mission of the college within a university system is a formidable goal, requiring strategic objectives and resources. In this paper, we describe our journey to rebuild a research enterprise in a Southeastern U.S. college of nursing using strategies which may be beneficial to other colleges/schools of nursing.

Setting and Historical Context

The University of South Carolina College of Nursing is located in Columbia, SC and is affiliated with an academic health center, Prisma Health. The college has a rich history of baccalaureate education (80 years), research-focused doctoral education (30 years), and nursing practice-focused doctoral education (20 years). In the late 1990s to early 2000s, the college was ranked in the top 25 of all colleges of nursing receiving NIH funding. During this time, the college had an impressive portfolio of NIH funding that included P30, R01s, R21s, along with F31 and K awards. Over time, with transitions in leadership, faculty retirements, and statewide demands to increase baccalaureate and advance practice nurses, the college's mission transitioned to a stronger focus on the teaching mission. As a result, by 2012, the college's federal research funding had significantly diminished, and the grant portfolio no longer held active NIH funding.

Self-Assessment/Context for Change

A new dean was hired in January 2013, with a charge and university commitment to grow the research productivity in the college. The university had a strong research mission, and the President and hiring provost wanted to bolster the college's research productivity. Likewise, tenure track faculty wanted to boost their scholarship productivity, grant funding, and research capacity. At this time, there were approximately 10 tenure track faculty who had the interest and potential for federal funding. On assessment, the faculty described their college as insular with limited collaboration outside the college, acknowledged the lack of capitalizing on both internal and external resources, lacked confidence in obtaining federal funding, and had a scarce supply of senior, experienced faculty to mentor junior faculty. In May 2013, the faculty and staff reenvisioned the college's strategic plan to include building the research infrastructure with the goal of increasing

sponsored research awards and faculty research productivity. To guide the process, an ecological model adapted from Weber-Main, Finstad, Center, and Bland (2013) focused on a multilevel approach targeting the institution, college, and individual levels (see Figure 1).

Strategies to Optimize Research Enterprise/ Build Infrastructure

Using an ecological approach, multilevel strategies were employed over time to rebuild the research enterprise and increase research productivity within the college. The initial strategies used were to broker resources and research support (university), solidify the focused research emphasis (college), recruit and target new leadership (college), select and hire additional tenure track faculty (college), and to strengthen the research infrastructure (college). In the following sections, we describe in more detail the focused strategies and implementation at each level (Table 1).

University Level Strategies

Brokering New Opportunities

Initially, the incoming dean brokered funding for five new tenure track lines and tuition support for PhD students, which are both vital to a productive research environment. Enrollment in the PhD program had diminished over time, and the provost and academic leadership understood the importance and financially supported the request. In 2013, the university operated under a centralized budget with the college receiving approximately 33% of facilities and administrative (F&A) costs from federal grants, which were then split by thirds; 11% allocated to the dean's budget for new faculty start-up packages, 11% to the associate dean for research on infrastructure needs, and 11% to the faculty investigators. The university adopted a new policy during this time supporting a faculty recruitment incentive program. The faculty recruitment incentive program policy allowed the hiring college to retain 100% of the facilities and administrative (F&A) dollars for any transferred grants from a newly hired faculty from another institution. We capitalized on this university incentive with the new dean (2013) and associate dean for research (2014) hires transferring two large NIH grants to the college. Over the past five years, the college has received approximately \$600k from these two grant transfers to help fund our infrastructure and new faculty start-up needs.

Leveraging Existing Resources and Opportunities

Another significant university resource available to the college to boost senior research hires is the "SmartState chair" initiative. Over a decade ago, the South Carolina

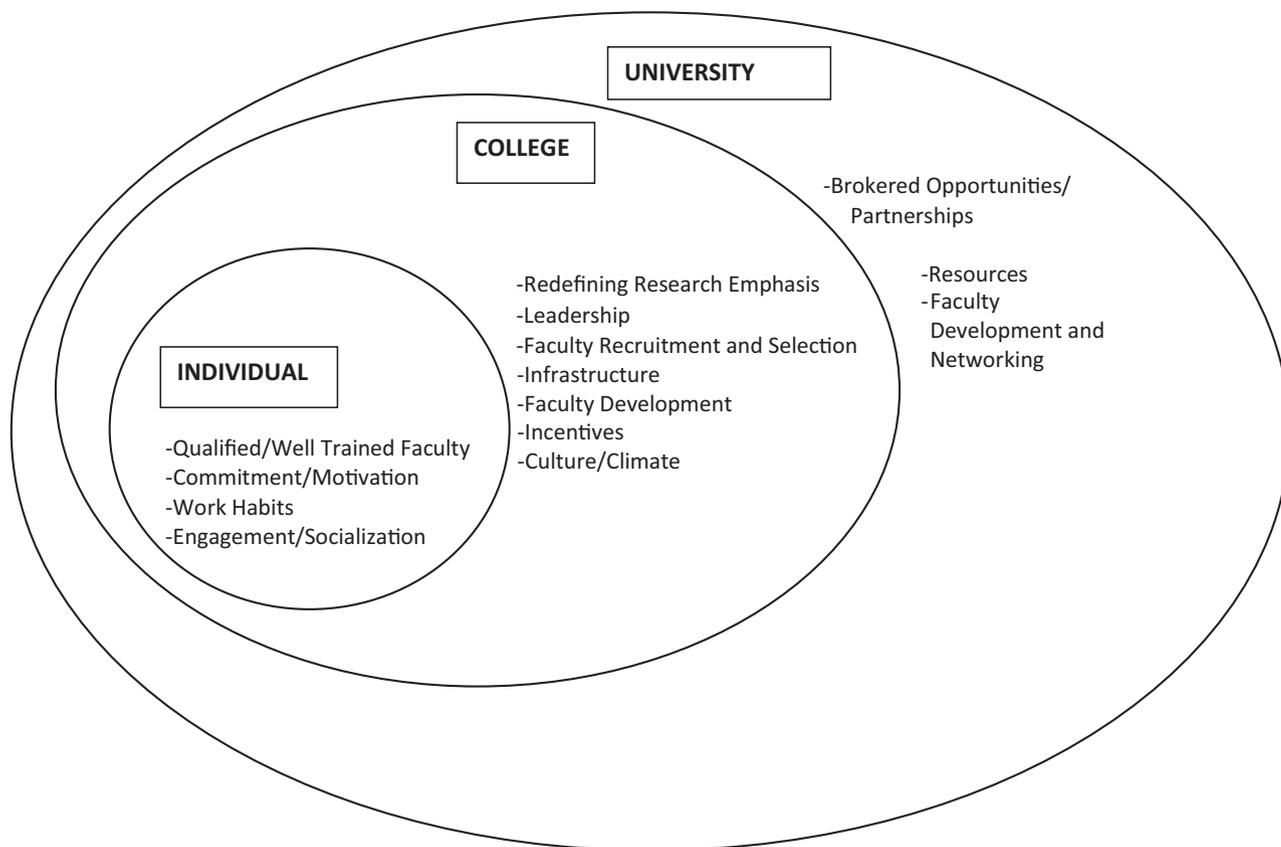


Figure 1 – Ecological approach to promote rebuild research enterprise. Adapted from: Weber-Main, A., Finstad, D., Center B., Bland, C. (2013). An adaptive approach to facilitating research productivity in a primary care clinical department. *Academic Medicine*, 88 (7), 929-938.

general assembly established this initiative to create centers of economic excellence in research areas that will advance the state’s economy. The college secured one of the approximate 50 chair FTE’s across the state’s three major research intensive universities, and has been a significant resource in hiring senior, funded research faculty. This college level position had been vacated in 2014, with a new SmartState chair hired in the college in 2017.

Over time, the college leveraged and capitalized on existing university resources that had been poorly utilized in the past: pilot grant awards ranging from \$10k to \$100k per year, and faculty development opportunities (e.g., grant writing workshops, research networks, and interprofessional research forums). To facilitate engagement with funding organizations, the university’s office of research charters a plane at least once a month to fly faculty to Washington D.C. to meet with program officers. A unique financial resource from the university is an award of \$1500 to the college for all doctoral graduates. The award is divided evenly between the dean to support faculty and doctoral student travel and the doctoral graduate’s faculty chair to use for research and scholarly activities.

Most recently, the college began brokering partnerships with the university’s office of economic engagement and center for entrepreneurial and technological

innovations to connect with industry and pharma partners for research collaboration. This initiative has resulted in two recent industry and pharma funded research grants, with others under negotiations. Additionally, college faculty, with university assistance and resources, have received significant funding from regional and national foundations in the past several years, which has expanded our funding portfolio.

College Level Strategies

Defining Research Emphasis

Rebuilding the research enterprise at the college level began with redefining and clarifying research emphasis areas so that potential faculty and student applicants would be able to recognize the college’s current strengths. In 2013, the college’s research council defined our research emphasis areas, and our team updated our web and marketing materials. In 2018, with the growth in faculty ranks and accompanying changes in research foci, we reconceptualized faculty strengths and expertise and identified our signature science, emerging science and methodologic expertise domains. The college’s research

Table 1 – Multilevel Strategies to Rebuild Research Enterprise

University Level Strategies	
Brokered opportunities and partnerships	Faculty Recruitment Incentive Program (FRIP) “SmartState Chair” initiative
Resources	Funding to support new tenure track hires Funding to support PhD student tuition Campus, foundation, industry, and federal stakeholders Financial incentives to college and faculty for doctoral graduate productivity Pilot grant awards ranging from \$10k to \$100k Travel resources to meet with NIH program officers Sponsored awards infrastructure
Faculty development and networking forums	Grant writing workshops Scholarly writing workshops Research networks and forums
College Level Strategies	
Defined research emphasis	Faculty defined research emphasis and strengths (2013) Reassessment of research emphasis areas with new hires (2017–2018)
Leadership	New dean (2013) and associate dean for research (2014) hired Smart State endowed chair hired (2017) Associate dean for faculty hired (2017) Reinforcement of expectations, opportunities, and outcomes
Recruitment and selection	Introductions to potential mentors, external networks Assuring “good fit” for culture Building critical mass with identified science areas Courting and attending to the interview process Tailoring opportunities for senior faculty
Infrastructure	Structured faculty mentoring plan Structured internal and external reviews and mock reviews Strong pre- and postaward staff PhD students as research assistants Weekly email communications with funding opportunities
Faculty development	Visiting scholars Scholarly writing clubs “Research Exchange” and interest groups Support for travel to national conferences/meet with external mentors
Incentives	Incentivize achievements (portion of indirects return to faculty, merit increases with federal funding) Provide boluses of protected time for junior faculty
Culture/climate	Role modeling and reinforcing work habits Sharing successes in weekly internal email communications, social media, and external monthly newsletter Creating and maintaining a shared vision
Individual Level Strategies	
Qualified and well-trained faculty	Faculty with history of scholarship/solid training background History of predoc or postdoc preferred for new assistant professor hire
Commitment/motivation	Commitment, passion, and dedication to the work/goals Co-create timeline for grant submissions with mentors
Work habits	Mentoring for best results in personal productivity
Engagement/socialization	Engage within college, university, and research networks externally Contribute to positive culture and climate Social gatherings outside college Participate in research council, mock reviews, research forums, and writing clubs

webpages have been updated to reflect these new areas of strength and foci.

Leadership

Shaping a leadership team who can cocreate and inspire a shared vision for the research enterprise has been a key factor in rebuilding our research enterprise. We hired an associate dean for research (2014) with a

strong record of NIH funding to guide the research mission, strengthen the infrastructure, and mentor junior faculty. A new SmartState endowed chair was hired in 2017, also a senior investigator with significant history of NIH and other federal funding, who helped to strengthen our focused research areas and mentor junior faculty. We created a new position, associate dean for faculty affairs, and hired our first faculty for this role in 2017, bringing another NIH funded,

experienced senior investigator to our team. The associate dean for faculty affairs is charged with faculty development and has been instrumental within a short time period in launching new initiatives. These new senior leaders, along with existing endowed professors and other new and existing senior faculty members, have added depth to our capacity, especially for mentoring junior faculty.

Recruitment and Selection of Faculty

Recruiting and hiring senior scientists with active programs of research and well-prepared junior faculty who have a desire to build strong programs of research has been a critical feature of rebuilding our research enterprise. Essential strategies include: marketing positions to garner initial interest in a position, “courting” potential faculty once initial interest has been garnered, attending to the interview experience, carefully evaluating candidate fit, and following up postinterview.

Marketing

In addition to print advertising in national venues, personal outreach to share specific faculty opportunities has been a successful marketing strategy for our team. Personal outreach can be particularly effective for several reasons. First, there is often some knowledge about the potential faculty member’s fit with the institutional need and culture. Second, there may be some knowledge that the potential faculty member is seeking a new opportunity for either personal or professional reasons. Third, personal outreach offers the opportunity to provide positive anecdotal experiences about the institution, one’s colleagues, and the community. Fourth, it provides an opportunity to dialogue specifically about how the potential faculty members’ unique strengths and skills would be a valued asset at the institution, as well as how the institution can meet some of the needs desired by the potential faculty member (e.g., research collaborators, mentors, participant populations, and seed grants). Personal outreach is an institution-wide effort. Thus, faculty positions are discussed and shared college-wide and with other university administrators.

Another marketing strategy we have used is advertisement at regional and national conferences. The approach is often multifocal with an advertisement in the conference brochure and/or on the conference website, along with other conference sponsorship opportunities such as a booth or sponsored presentation or reception. For a recent regional research conference where many faculty and students were presenting, a brochure was created that listed all college-affiliated presentations, and highlighted times that the dean and specific research faculty would be at the college’s booth. The brochure served as a reference tool to connect potential faculty members with others at the college doing similar research. The college has one full time communications staff member who has

expertise in graphic design, social media, and website development to assist with marketing strategies.

Courting

According to the most recent survey by AACN, there are nearly 1,600 faculty vacancies, with most requiring a doctoral degree (Li, Kennedy, & Fang, 2017). The competition for faculty often necessitates a courting process once an initial expression of interest has been garnered. Strategies we have used include intermittent contact with the potential faculty member through email or telephone, personal meetings that include invitations to a meal at a mutually attended conference, and inviting the potential faculty member to visit the campus and college to deliver a presentation or provide consultation. The latter strategy allows both parties to do an evaluation of potential fit prior to a formal application, which can be particularly important to senior faculty.

Interview Experience

Attending to the entire interview experience has been paramount. Positive and enjoyable interview experiences were created by attending to details such as providing quality hotel accommodations, meeting with potential research collaborators within and outside of the college and university, and inclusion of spouse/partner for meals and social events. Through the personal outreach and courting strategies previously discussed, knowledge attained about the faculty candidate’s personal interests or needs are used to help the candidate envision living in the region. Positive aspects of the community and region, which align with the candidate’s interests and needs, are highlighted during the interview process. The needs of the faculty candidate’s family are also given consideration, for example, the needs of elderly parents and children’s primary school or college preferences.

Candidate Fit

Evaluating fit has been vital for both the college and the candidate. A written evaluation is used to obtain feedback from the wide range of faculty, staff, and students who interact with the candidate during the interview and faculty presentation. Consensus has rarely been achieved, but weighing all opinions has been vital. At a more abstract level, the candidate’s fit with the university and college missions, the university and college cultures, and the direction and potential of the candidate’s research has contributed to successfully building the research enterprise.

Postinterview Follow-Up

Due to the availability of faculty positions for both junior and senior researchers, desirable candidates had their choice of several faculty positions. Following up with candidates by email or telephone, following their interview, to “check in” about their decision-making and answer any questions, has been essential. To that end, when candidates have expressed a strong interest,

a second campus visit has been offered. The visit is tailored to their needs which include bringing a spouse/partner or other family member to see the area and meet with a realtor, and candidate meetings with key people within or outside the college either for the first time or to reconnect. In essence, the postinterview follow-up has served as a vital extension of the “courting” process. Research space, equipment, staffing, and other needs associated with funded faculty upon hire are carefully considered during the hiring negotiations.

Infrastructure

At the preaward stage of grant submissions, there has been and continues to be a designated program coordinator in the college’s office of research who works with the faculty member and the university’s sponsored awards management representative to ensure that the grant submissions adhere to sponsor guidelines. The program coordinator also helps the faculty member develop the budget and obtains subaward documents and letters of support for the grant. This valuable assistance allows the faculty member to focus effort and energy into the science underlying their research. Faculty are also provided support for dissemination of their scholarly work with another staff member in the office of research who assists with templates, printing of posters and templates, and formatting of scientific presentations. A weekly e-mail newsletter from the office of research alerts faculty to grant funding and training opportunities at the local, regional, and national levels. Likewise, we have a seasoned postaward team who assists faculty with the financial and regulatory needs to administer their funded proposals.

A systematic approach to grant application reviews has been adopted with a goal of submitting grants that would be scored. Junior faculty submitting federal grants are provided with a mock review of their grant applications. The mock review panel consists of at least one reviewer external to the university and two college or university faculty at the associate professor level or higher who have the appropriate grant review experience. Faculty who have received prior funding at the national level are expected to obtain a written review from a reviewer with relevant expertise. The office of research provides an honorarium to the external reviewer for mock reviews and to those who provide a written review of the grant. Faculty are encouraged to diversify the funding sources to include foundation support, and industry/pharma funding in addition to federal funding.

The office of research began employing a PhD student who works 20 hours per week in 2017 to assist faculty with literature searches, create tables/graphs for manuscripts, and construct endnote libraries. This assistantship also allows the graduate student to meet with various faculty, learn about their research foci, have hands-on opportunities to learn various methodologies, and has led to student coauthorship on manuscripts. A faculty member in the college, who serves

on the institutional review board (IRB), is available to assist new faculty with new IRB submissions. To meet the increased needs for statistical support particularly for large federal grant submissions, salary support for 10 hours per week is provided for an additional senior biostatistician from another department on campus who provides grant and statistical consultation, as well as serving as a coinvestigator, as appropriate.

Faculty Development and Training

To facilitate learning new approaches to research, the associate dean for research invites visiting scholars who are cutting-edge national and international methodology experts, to present all-day workshops for the faculty on research methods. When possible, faculty have the opportunity to meet with the expert for consultation on their individual research. Similarly, faculty are invited to attend shorter workshops on research relevant skills training such as Research Electronic Data Capture, database administration, and updates on IRB and HIPAA requirements.

To improve the science footprint in the college, multiple opportunities to engage all faculty in research and scholarship have been established. First, the associate dean for research established a monthly “Research Forum” series that is scheduled for a day/time when a majority of the faculty are on-campus. Featured speakers include both senior faculty with on-going research and junior faculty (e.g., faculty who have received pilot funds), and all faculty are invited. The formal structure of the research forum allows faculty members to learn about each other’s current work. The college’s center for cancer survivorship sponsors research forums quarterly with speakers across the campus and invited guests from other universities for interested faculty across the campus working in this area. In addition, a college sponsored journal club is available to all faculty and students across multiple colleges. There have been multiple transdisciplinary forums sponsored by the college and our partnering health sciences colleges (public health, pharmacy, social work, and medicine) over the past few years in which our faculty are increasingly engaged.

“Research Exchange” facilitates collaboration early in the development of a study idea. With the goal of assisting clinical faculty to further develop their scholarship and develop collaborations with tenure-track/tenured faculty, the associate dean for research offers an annual “Research Exchange” event during the spring semester. This structured event, on the lines of “speed dating” has been well attended by faculty across tracks and received very favorable postevent evaluations. In conjunction with “Research Exchange,” the associate dean issues a call for seed fund proposals that encourages collaboration of tenure track and clinical track faculty. “Research Exchange” has led to new collaborations across faculty tracks and funded seed projects. Funding for each project is less than \$10K and the results have been disseminated through podium and poster presentations at regional, national

and international nursing conferences, and manuscript submissions. This broader approach to developing research productivity across all faculty, and not only the most accomplished. [Bland, Center, Finstad, Risby, & Staples, 2005](#)) encourages and leverages the skills available among faculty across tracks.

To foster biomedical research, encourage a team-oriented approach needed to tackle complex health care challenges, and leverage the tremendous momentum brought by technology advancement, the associate dean for research offered a "Research Exchange" event for faculty from the college of engineering and computing, who have been nontraditional research partners for college of nursing faculty. This event allowed faculty to discuss their health-oriented research interests in small groups and make connections with faculty who can further enhance nursing research. While interdisciplinary collaboration for research is not new, the most successful collaborations require exploration of potential colleagues' expertise and interests during the design or development phase of a project rather than asking them to join the team at a later point ([Conn et al., 2015](#)).

The associate dean for faculty affairs established two writing groups which meet monthly, each with a mix of clinical and tenure track faculty to work on publications and/or grants by pairing faculty for an exchange of critique and feedback which increased collaborative dissemination. In addition to leading the writing groups, the associate dean for faculty affairs assists faculty with progression, mentoring, and faculty processes related to scholarship, teaching, practice, and service. The associate dean works collaboratively with individual faculty and faculty groups to increase the rigor and specificity for faculty evaluation and promotion criteria related to scholarship/research, teaching, and service. She has also been effective in cataloguing faculty interests, and connecting clinical faculty with tenure track faculty for study collaborations through synthesis of their individual interests.

Faculty are encouraged to learn the nuts and bolts of grant writing at workshops offered by the university, other departments, at scientific meetings of professional organizations, and at NIH. Start-up funds can be used toward the registration fees for these professional development activities when necessary. Junior faculty have also taken advantage of specialized training/courses (e.g., conducting randomized trials, physical activity and public health, and biobehavioral research in oncology) to enhance their abilities to compete successfully for national and federal funding. Participation in training workshops allows faculty to meet potential collaborators/consultants for future grant applications, senior scientists who can serve as mentors on career development awards, and widen their formal and informal mentoring networks.

Mentoring

A structured mentoring plan was established in 2013 with mentee and mentor guidelines and 1-year and

5-year goals worksheet. The mentoring plan and associated processes continue to be refined each year. Questions about mentoring are the most frequently raised during the hiring process for junior tenure track faculty. At the interview stage, matches between the research interests of the applicant and current faculty within the college and university are identified and these individuals are asked to interview the applicant. After the hiring decision has been made, the senior administration identifies a teaching and a research mentor for new faculty (in many cases, these are based on the new hire's preferences) who will then introduce the mentee to potential collaborators, resources for conducting research within the university, university-wide competitive grants, community partners for research, and sites to recruit graduate research assistants/project staff, among others. Senior administrators are also available to provide mentoring as requested. With their start-up funds, junior faculty may also travel to meet with external mentors in their field at national conferences or at another university.

Education for faculty on mentoring doctoral students and junior faculty had been lacking in our college. To address this, our PhD program leadership held a workshop for faculty to provide tools for mentorship of doctoral students, with tools adapted from the Robert Wood Johnson Nurse Faculty Scholars program ([Campbell et al., 2017](#)). Faculty in the PhD program have acknowledged that mentoring doctoral students increases faculty productivity with collaborative research, presentations, and publications. Faculty have expressed interest in more education about mentorship and addressing this need has become one of the foci of the faculty research and scholarship council. Faculty are also encouraged to participate in external mentoring programs, to include NIH, Macy Foundation, and other organizations.

Incentives

Faculty incentives for scholarly productivity are wide-ranging. As described earlier, faculty who are the principal investigator on a federal grant with F&A costs receive a portion of these funds to enhance their scholarship with an incentive account. Several faculty at all ranks hold these incentive accounts that they can utilize to enhance their research efforts. Faculty who chair doctoral committees receive funds in their incentive accounts as described earlier.

We provide \$1500 to \$1800 travel funds to each faculty per year for podium and poster presentations to increase the visibility of faculty regionally and nationally to improve motivation and strengthen confidence in their ability to conduct research. Federal funding has also been rewarded with significant merit salary increases. New tenure track faculty receive boluses of protected time during their first 3 years to allow them to focus on their research productivity. Specifically, in year 1, new tenure track assistant professors receive one semester with no teaching, and one semester

coteaching one course. In year 2, assistant professors teach one course per semester, and in year 3, teach a total of three courses. Newly hired assistant professors are provided summer salary for their first 2 years to provide additional time to develop and submit grants and manuscripts.

Sharing faculty' successes with publications and scholarly dissemination at conferences on social media, the college website, and internal weekly e-newsletters are other public avenues of identifying valued academic activity and offer opportunities for recognition from other colleagues. There has been an intentional focus to increase the number of nominations for college-specific awards, university-wide awards, and national nursing awards for research excellence. Although these are not tangible incentives, they do contribute to a culture where scholarly productivity is encouraged by all faculty.

Culture/Climate

Engaging and energizing faculty interests in research and scholarship, when teaching needs expand for a growing student body in all programs, is a continuous challenge for the college. To bring about change in attitudes toward conducting research, research and scholarship expectations are made clear during interviews and the hiring process for faculty in all tracks. New faculty are offered office space in proximity to potential collaborators to allow for closer mentoring and natural opportunities for informal discussion. Cultivating a nurturing environment includes the exploration of key questions by senior leadership during regular rounding, such as: Do you have what you need to be productive? (i.e., submit a grant, implement a project successfully); identifying resources to the extent possible; making introduction to potential mentors/collaborators; and, providing other guidance as needed (Travis & Anthony, 2011).

Another important strategy in highlighting the value of research and its visibility has been the reinstitution of our "Research and Scholarship Day" that showcases students' posters and presentations along with nationally renowned keynote speakers. The event is well attended by community partners, and representatives of the regional health care systems and government health care agencies. A committee of faculty across tracks organizes this event and hence it is a healthy reflection of the ownership by faculty and the growing recognition of the importance of research.

Individual Level Strategies

Individual level strategies have been realized in four major areas: qualified well-trained faculty; commitment and motivation; work habits; and engagement and socialization. Our college has been very selective with new tenure track hires. For new assistant

professors, candidates who have had solid training from a reputable doctoral program, strong references from doctoral mentors, have a pre- and/or postdoctoral funding history, a history of publications, a "fit" with our research emphasis and our culture, and strong potential for federal funding are preferred. The college leadership recognizes that attaining research funding is challenging, yet faculty have been committed to the process and are highly motivated to achieve their goals. At hire, goals and timelines are established with the faculty's respective mentors, and faculty have been responsive to both. The two faculty writing groups discuss suggestions for finding time to write manuscripts and grants while faculty juggle other aspects of their workload including teaching and for some faculty, practice commitments. Faculty mentors also address work habits to enhance productivity while helping faculty focus on career advancement.

College leadership has been especially attentive to engaging and socializing all faculty in the arena for scholarship, and rewarding successes within the college. Faculty successes with presentations, publications, and grant funding are celebrated weekly in the college communication email. With an active research council, mock reviews, research forums, and writing clubs, faculty are being stimulated, and a culture of "team wins" and shared vision are emerging. Likewise, faculty are encouraged to engage with the university and external research networks to fully capitalize on their potential for individual growth. "All work and no play" as the axiom warns, may not lead work to satisfaction/quality life. Hence, faculty with similar life phase needs (those with young children, college-bound children) are encouraged to get to know each other and share common life experiences. University offerings that focus on individual health and a positive work-life balance are shared in weekly communication, and faculty and staff champions encourage engagement with health-focused activities. In 2018 a space in the building was equipped with exercise equipment to encourage self-care through physical activity. All faculty are invited to attend informal meetings at restaurants or other gathering places at the end of the work week, if they so choose, to take a break from our work selves, and to foster relationship building at other levels. Faculty are encouraged to refresh over holiday and vacation breaks to reenergize and promote productivity on their return.

Impact of Strategies

To assess the impact of these initiatives, data are collected on a variety of outcomes from college and university databases. Intramural and extramural grant funding are tracked in the college's internally maintained Microsoft Access grant database and compared with the university's sponsored award database. Scholarly publications and presentations are

maintained in an internal database in the college. Faculty are asked to send publication and presentation updates regularly to the office of research and verify the list for annual publications and presentations in January each year. Dissemination achievements are collated for annual college and university reports and maintained in an internal Microsoft Access database.

The college has experienced a significant growth in all areas of the mission (e.g., teaching, research, practice, and service) in the past 6 years. In the fall of 2018, 92% of full-time faculty have a doctorate degree, compared to 67% in 2012. The remaining faculty who do not have a doctorate degree are enrolled in doctoral programs. Tenure track faculty have doubled between 2012 (11) and 2018 (22). The ratio of tenure track faculty to clinical track faculty is now 40%:60%, up from 33%:67% in 2012.

As shown in [Table 2](#), the average extramural funding per year in the 5-year period preimplementation (2008–2012) compared to the following 5 years (2013–2017) increased 118%. While only a single year, the amount of funding in fiscal year 2018 exceeded the average amount per year in the preimplementation phase by 400% as shown in [Figure 2](#). In fiscal year 2019, the college is on track to exceed 2018 funding. Likewise, the average funding per tenure

track faculty per year has also increased from preimplementation period (2008–2012) to the postimplementation period (72%, 2013–2017) and most recently to 149% (2018).

Peer-reviewed manuscripts by tenure track faculty have increased from an average of 18.2 per year in the preimplementation period (2008–2012) to an average of 35 per year (2013–2017) and 67 in 2018, which represents a 92% and 268% increase respectively. Likewise, peer-reviewed manuscripts per tenure track faculty per year have increased from 1.65 in the preimplementation phase (2008–2012) to 2.5 in the postimplementation period (2013–2017) representing an increase of 92%. Data from the last academic year show an 82% increase from the preimplementation period (e.g., average of three publications per tenure track faculty up from 1.65 per year in 2008–2012).

In 2012, the college had no NIH funding with college faculty as principal investigator status and was not ranked. In 2014, the college moved to the top 64 among colleges of nursing in NIH ranking, and in the past 2 years, the college has been ranked in the top 30 to 31 ([Blue Ridge Institute for Medical Research, 2018](#)), and is on track to continue to improve in ranking based on the pipeline of submissions and recent NIH awards over the past several months.

Table 2 – Changes in Research Productivity Per Tenure Track Faculty

	2008–2012 (Preimplementation)	2013–2017	2018	% change from 2008–2012 to 2013–2017	% change from 2008–2012 to 2018
Average extramural funding/year	\$0.8 million	\$1.75 million	\$3.98 million	+118%	+400%
Extramural funding per TT faculty/year	\$72,727	\$125,251	\$180,909	+72%	+149%
Peer reviewed publications/year	18.2	35	67	+92%	+268%
Peer reviewed publications per TT faculty/year	1.65	2.5	3	+52%	+82%

Average \$\$ Extramural Sponsored Awards Per Year

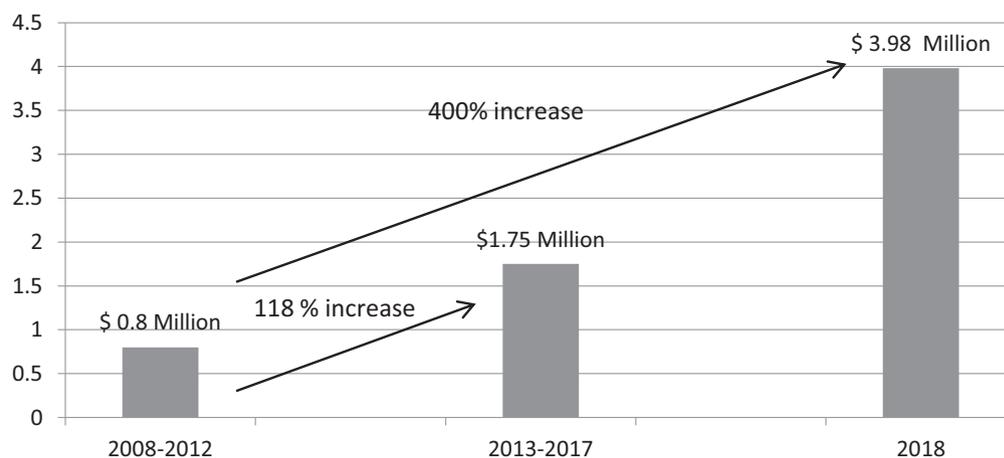


Figure 2 – Average \$\$ extramural sponsored awards per year.

Future Considerations

Using an ecological approach, we have made great strides in rebuilding our research enterprise while maintaining our college of nursing's quadruple mission. Several strategies have been critical to the success of our trajectory of growth: buy in and resources from the university leadership, innovative, and strategic hiring of new leadership and faculty with productive programs of research within the college, faculty development and engagement with scholarly activities, and committed and dedicated faculty.

While the past 6 years have been replete with efforts to transform a dormant research culture into a dynamic ever-growing one, we anticipate challenges to sustain the momentum. We recognize that this will involve strategies at the individual, college, and university levels (e.g., faculty hires, infrastructure grants, and retention packages) – all of which require resources and investments. We offer the following considerations that can impact our efforts to grow and sustain the research enterprise.

The recruitment of junior faculty with high potential to become successful nurse scientists will be partially affected by the quality of training that current nurse PhD programs provide both in the depth and breadth of exposure to research methodologies, research experience that encompasses more than the completion of a dissertation, data analyses skills and preparation for grant writing. Colleges of nursing with doctoral and postdoctoral training programs are also facing pressures to develop on-line programs and/or hybrid approaches to attract and retain students. However, there are few data that have been reported that assess the effectiveness of program and graduate outcomes from alternative delivery models compared to the traditional classroom models (Broome, Halstead, Pesut, Rawl, & Boland, 2011). A national study of nursing PhD alumni demonstrated that graduates who had worked as research assistants, attended classroom-based programs, and worked as a nurse no more than 12 hours during their PhD education, were more likely to have successful publication records and receive external funding than graduates who did not have these experiences (Ellenbecker, Nwosu, Zhang, & Leveille, 2017). Others report that percentages of faculty with research grants, supportive environments, leadership, and infrastructure are significant factors in determining the quality of PhD programs (Kim, Park, Park, Khan, & Ketefian, 2014). With a shortage of doctoral prepared faculty and a decline in PhD enrollment since 2014 (AACN, 2018b), the need to sustain excellence and relevance in PhD education is critical (Breslin, Sebastian, Trautman, & Rosseter, 2015). In order to prepare future nurse scientists with a passion and capacity for scientific inquiry and teaching in research intensive environments, additional research is needed on the processes, delivery, and quality of PhD programs to fully inform our future paths.

In their first few years as faculty members, internal funding is required for junior nurse scientists until they achieve independence as principal investigators. The protected time for research, start-up funds, salary support in summer, and the significant time investment in mentoring by senior faculty have been recognized as investments in individual junior faculty (Broome & Fairman, 2018). We have been successful to date with the “K” approach: three of four junior faculty hired within the past 4 years who have secured mentored research career science awards from NIH (e.g., K01, K08, and K23) and/or a mentored research scholar grant from the American Cancer Society. These early career mentored awards protect 60% to 75% of the faculty's time for designated research for the time of the grant, typically 3 to 5 years. This is a promising trend but it will take several years before these faculty mature into seasoned scientists and additional time is needed to fully evaluate the effect of this approach, especially the progression of funding to an “R” level grant from these national agencies.

Researchers show that there are generational differences in factors that influence nursing faculty to remain in academic positions (Tourangeau, Wong, Saari, & Patterson, 2015). Generation-Y faculty report that the most enticing incentive fueling their desire to remain at an institution is opportunities for advancement. Generation-X faculty reported a strong desire for work/life balance. Across all generations, enticements that contribute to decreased attrition for all faculty are having a supportive dean, supportive work colleagues, and a reasonable workload (Candela, Gutierrez, & Keating, 2015; Tourangeau et al., 2015). As our senior faculty retire and more junior to midlevel researchers are hired, we must continue to provide a supportive environment and continue to pay attention to individual faculty career goals to identify opportunities for advancement.

We expect that mentoring of all faculty, regardless of track or rank, will be key to strengthen individual faculty members' commitment and motivation to build and enhance research programs through iterations of manuscript and grant submissions and resubmissions. Managing and supervising research teams and staff involve skills that many entry-level faculty will need to learn fairly quickly so that their first few funded projects are successful. For mid- and senior-level faculty, mentorship from peers and senior scientists will help to identify fresh approaches and new collaborators to reinvigorate lines of research that may no longer be attractive to funding agencies. On occasion, college-level resources will be needed to provide bridge funds for individual faculty members and investments in specialized training will be required to enhance their productivity. If such efforts are not effective, in these cases, we anticipate that while it is not desirable, it may be necessary to increase teaching requirements.

The diversity of our faculty engaged in research is another dimension that needs attention. The college

has recently recruited an associate dean for diversity, equity, and inclusion to foster and guide efforts in education, research, and practice. This associate dean also has a strong history of NIH and other federally funded research. Our minority representation at the faculty level is growing (currently 23%) and higher than the national average of faculty (19.2%; [National League for Nursing, 2017](#)), yet we aim to be more proportional to the demographics in our state (34%; [US Census Bureau, 2018](#)). We are focusing concerted efforts in the next few years to attract and retain a diverse faculty actively engaged in research.

Finally, we recognize the challenge at the upper administration level is to keep our strategic research plan explicit and allocate resources (starting with faculty recruitment, investment in key areas, bridge funds, faculty retention packages, and the like) in alignment with the plan ([Minnick, Norman, & Donaghey, 2017](#)). At the college level, we will carefully consider future hiring, revisiting criteria for annual evaluations and promotions to be commensurate with the new directions, and merit-based increases. As grant funding increases, we plan to grow our infrastructure where needed (e.g., database management, additional senior statistician time), build research capacity and enhance specialty training for research. We plan to support initiatives that fit with the research foci that have been identified, foster collaboration across faculty tracks and colleges and discourage maintaining low productivity as the status quo. We will also track retention and progression of new hires and examine reasons for attrition beyond anticipated retirements.

Conclusion

Continuing to cultivate our research portfolio in the face of growing competition for scarce funds at the national level is a challenge. Our journey over the past few years gives us optimism that together with committed faculty, we can provide a supportive environment at the college level to foster research and scholarship excellence and facilitate individual faculty's career growth. Public universities like ours, face continuing pressure for undergraduate education to meet workforce needs. Hence, obtaining and allocating limited resources to research will continue to require skilled, transformative, and visionary leadership at the college and the university. As a team, we aim to- and can achieve high impact, innovative and nationally recognized research and scholarship.

In conclusion, it is evident that a college of nursing who has had marginal research productivity over a decade can re-establish and build research productivity. An ecological approach, employing university, college, and individual level strategies have been

effective in a relatively short period of time in our college. Sustaining and further expanding the research enterprise will be met with challenges, as all research intensive colleges of nursing face, and will require ongoing analyses of what is working and not working, innovative strategies with scarce resources, and remaining intentional with this important aspect of our mission.

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