BEYOND BOUNDARIES

THE FUTURE ROLE OF FACULTY

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During the last 20 years, there have been major disruptions in higher education including: a decrease in state funding of public institutions, an increase in technology, a shift in student demographics, and a growth of interdisciplinary work. These disruptions have produced new needs for higher education to address. As individual institutions begin to address the future needs of higher education, they must pay close attention to the development of faculty. Faculty development is a "strategic lever for institutional excellence and quality, and a critically important tool for fostering institutional readiness and change in response to the array of complex demands facing universities and colleges" (Austin & Sorcinelli, 2013, p. 97). Given the importance of faculty in institutional success this paper discusses more details about each of these disruptions, the future role of faculty, and a few faculty development models worthy of consideration.

Financial Constraints

A major disruption in higher education has been a decrease in state funding. In the last twenty years, public institutions have experienced a significant decline in state funding and an increase in accountability. As state appropriations have continued to decrease (See Figure 1 and Figure 2), operating costs have increased for institutions (Conner & Rabovsky, 2011). Colleges and universities have had to find additional funding streams including private donations, research grants, partnerships, and student tuition. Bain & Co examined a number of higher education institutions and found that one third of institutions had financial statements that were weaker than they had been in the past (Denneen & Dretler, 2012). Institutions had more liabilities, debt service, and expenses that were not being sustained with enough revenues (Denneen & Dretler, 2012).

Figure 1: United States, Net Tuition Revenue per FTE, Educational Appropriations per FTE and Enrollment between 1989-2014 *(includes adjustment for inflation over time)*
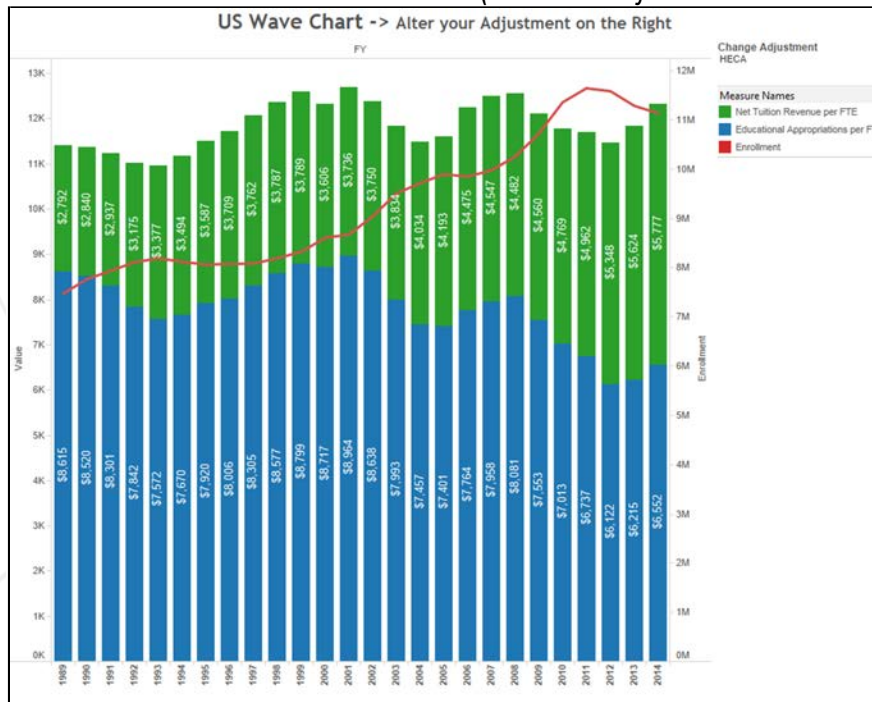
Source: State Higher Education Executive Officers Association

Figure 2: State of Virginia, Net Tuition Revenue per FTE, Educational Appropriations per FTE and Enrollment between 1989-2014 *(includes adjustment for inflation over time)*
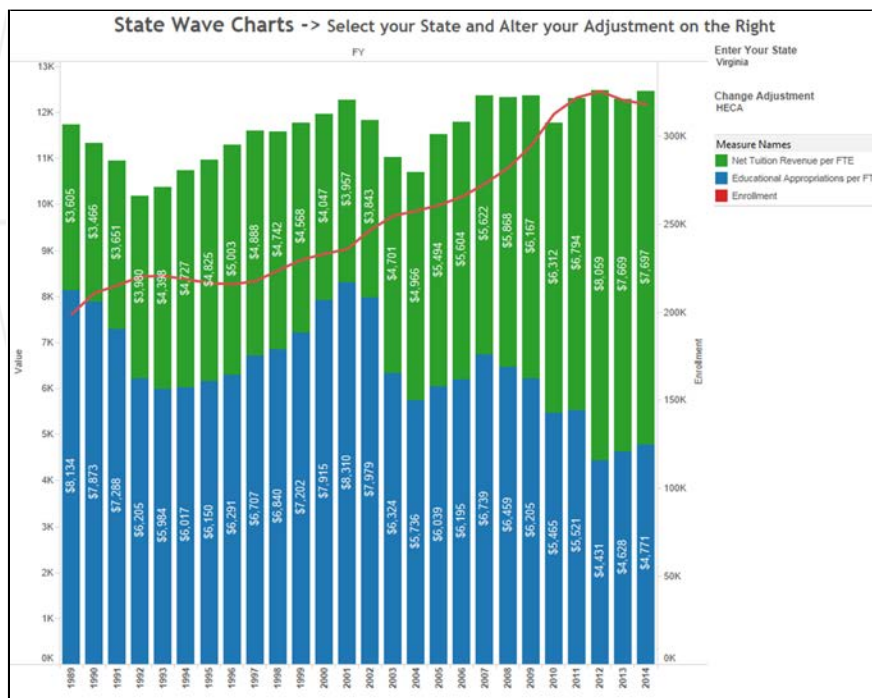
Source: State Higher Education Executive Officers Association

In 2014 higher education institutions in Virginia received only $4,771 in educational appropriations per student FTE (see Figure 2). Between 1989 and 2014 there was a 41.3 percent decline in education appropriations per FTE. Meanwhile, net tuition revenue per FTE has increase by 113.5 percent during these same 25 years. *For more on funding shifts, see Funding Models and Virginia Tech white paper. The focus of this paper is how financial constraints impacts the role of faculty.*

Simultaneously, many states have created performance-funding policies as a means to enforce accountability in higher education (Rabovsky, 2012). In July 2015, thirty-two states[1] had funding formulas or a policy in place to determine the amounts of funding for institutions. Some of the funding formulas and policy performance indicators include: time to degree, transfer rates, number of low-income and minority graduates (National Conference of State Legislators, 2015). In Virginia, the incentive-based funding model require institutions to meet performance metrics in the following areas:

- In-State Enrollment
- Degree awards
- Need-based borrowing
- SACS program review
- Retention rate
- Transfer agreements
- Dual enrollment
- Patents and licenses

- Underrepresented enrollment
- Affordability
- Tuition assessment
- Degrees per FTE faculty
- Degrees per FTE students
- Degree transfers
- Research expenditures
- K-12 partnerships Campus Safety and Security

(National Conference of State Legislators, 2015)

In exchange for greater autonomy institutions are able to keep unexpended funds. Performance-based funding is a way that the government and private funders can demand greater accountability of higher education institutions. This accountability movement has resulted in greater assessment of academic work (e.g., teaching, service, etc.) and has changed the academic workplace in institutions (Altbach, 2002).

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[1] Arizona, Arkansas, Colorado, Florida, Illinois, Indiana, Kansas, Louisiana, Maine, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, New Mexico, New York, Nevada, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, South Dakota, Tennessee, Texas, Utah, Virginia, Washington, Wisconsin, and Wyoming

Appointments and Compensation

Fiscal constraints have also impacted faculty employment. Some institutions are seeking to create more financial flexibility by diversifying the employment classifications for faculty. There has been increased interest in several other types of faculty positions that do not always lead to tenure. Other types of appointments include contingent faculty positions. In large part, this is because permanent positions have lower costs (Ochoa, 2012). Contingent faculty are often hired at lower wages, without most fringe benefits or full faculty rights (AAUP, 2014). In 2007, almost 70 percent of faculty had non-tenure track appointments.[2]

 Universities and colleges have developed various models that diverge from traditional tenure-track appointments. Institutions like Franklin W. Olin College of Engineering and Lindenwood University, both private and not-for-profit institutions, do not have any tenure-track positions for faculty (Stripling, 2011). Lindenwood University abolished its tenure system in 1994 and Franklin W. Olin College of Engineering opened in 2002 with only five-year faculty contracts. These nontenure systems allow the institutions more flexibility when changing or phasing out programs (Stripling, 2011).

Other institutions use models that allow faculty to choose an employment track. Webster University asks professors to select one of two tracks. One track allows faculty members to earn tenure (Stripling, 2011). The other track does not lead to tenure, but allows faculty members to go on sabbatical every five years versus every seven. Faculty with development leave are reviewed every five years (Stripling, 2011).

In 2009, the American Association of University Professors (AAUP), put forth a report on tenure and teaching intensive appointments explaining that while tenure-track faculty positions tend to be research-intensive, there has been a shift in making "teaching intensive" appointments into untenurable "teaching-only" appointments. The report argues that this shift leaves the question, "should more classroom teaching be done by faculty supported by the rigorous peer scrutiny of the tenure system?" (AAUP, 2014).

Some research has revealed that having fewer tenure-track faculty positions negatively impacts undergraduate education. Umbach (2007) argued, part-time faculty

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[2] This included full-time tenured, full-time non-tenure-track, full-time tenure-track, and part-time faculty from all degree-granting institutions in the nation. This information was retrieved from http://www.aaup.org/NR/rdonlyres/7BAE5D10-3DE3-404D-99A7-23183E9027E4/0/Fig4.pdf

challenge students less and spend lower amounts of time preparing for class. However, tenure-ineligible full-time faculty had more similarities with tenured and tenure-track faculty in how they structure classes (Umbach, 2007). Furthermore, both part-time faculty and tenure-ineligible full-time faculty spent less time interacting with students outside of class than tenured and tenure-track faculty (Umbach, 2007).

Meanwhile other researchers have found that the impact contingent faculty and tenured or tenure-track faculty have on students can vary. Undergraduate students who have taken a class with an adjunct or graduate student are less likely to take another course in that discipline (Bettinger & Long, 2004). However in the disciplines of psychology, physics, and architecture, adjuncts and graduate students have a positive effect on students enrolling to take more courses within the same discipline (Bettinger & Long, 2004). Although research on the impact that having a greater number of non-tenure track faculty has yielded mixed findings, we certainly see innovation in the traditional system caused in part by the need for financial flexibility.

More Technology

In the past two decades there has been an increase of information and communication technology which has resulted in new ways for higher education to be delivered (Gehrke & Kezar, 2015). Institutions now offer a higher number of online courses and degree programs to students world-wide. In this manner, many institutions have adopted a global presence.

By providing online education options, universities and colleges have the potential to find new streams of revenue. Yet, technology investment is costly because universities and colleges need to establish the necessary infrastructure (e.g., computers and software) and fund ongoing expenses. Technology investment calls for institutions to provide ongoing training and maintenance, internet, access, and electricity (Njenga & Fourie, 2010). Additionally, other ongoing costs can include copyright clearing, access, and adapting learning materials.

Therefore, new business models that go beyond online or in-person classes need to be developed for two reasons: enhancing learning and managing costs and revenues. Through the use of technology, institutions can make education more accessible in ways that are highly personalized to students' learning needs and provide academic support (Greenstein, 2013). With technology-enhanced learning, colleges and universities can provide

interactions with advisors and instructors, aspects that are costly in the traditional seat-based model.

Some institutions have made parts of their curriculums available online. Earlier this year, Arizona State announced its Global Freshman Academy through which eight courses would be offered toward fulfilling the freshmen year general-requirements. Since the courses will be offered as massive open online courses (MOOCs) the cost to students is lower and would not require the completion of the traditional application process (Huckabee, 2015). Students who pass a final examination in one of the courses will be able to pay a fee per credit hour and obtain academic credit.

Knowledge and Skills in Technologies

Today's students are more diverse and have great amounts of knowledge in technologies. Similarly, future students will expect their educational experiences to include opportunities that include technologies. Because of technologies becoming highly infused into higher education, faculty will need to develop the necessary skills and resources to incorporate these into their teaching practices and curriculum (Austin & Sorcinelli, 2013).

A recent study conducted by Gallup on behalf of Inside Higher Ed, examined the practices and perceptions of faculty and administrators who oversee educational technology, online learning, and other classroom content requiring technology. There were 2,799 web surveys collected from faculty. Findings from this survey revealed that 32 percent of faculty had taken an online course (Inside Higher Ed, 2015A). One out of every three professors reported having taught an online course. Faculty members who had not taught an online course reported that it was due to never having been asked; it was not because of a lack of interest in teaching in this manner or perceptions of online classes being of less value (Inside Higher Ed, 2015A). The majority of faculty reported using learning management systems (LMS) to share the syllabus with their classes, record grades, and communicate with students (Inside Higher Ed, 2015A). However, more than half of faculty disagreed that their institutions offered the necessary support for online learning (Inside Higher Ed, 2015A).

In order for faculty to further develop their technology skills, institutions must develop the capacity to support the use of these technologies and provide a variety of opportunities that take into account faculty's diverse learning needs. In turn, faculty members will need to increase the use of technologies into their classes, and learn to teach in

"blended and online environments" (Austin & Sorcinelli, 2013, p. 89). In some disciplines faculty members also need to develop skills in new technologies for their research. By investing in the development of faculty, institutions are more likely to provide their students a quality education.

Some institutions have collaborated in developing resources for their faculty. Four liberal arts colleges: Colgate University, Davidson College, Hamilton College, and Wellesley College recently created a consortium to help improve teaching online and on campuses. Part of their efforts to improve teaching includes selecting faculty across all four institutions with overlapping interests and having them explore the types of collaboration that can be created (Inside Higher Ed, 2015B). Material created by this group of faculty members will be used to develop a teaching resources website for faculty from the four institutions. Additionally, the colleges are planning to have faculty members across the four institutions co-teach courses (Inside Higher Ed, 2015B). *For more about the role of technology in the classroom see Learning Spaces and Infrastructure white paper. The focus of this paper is how technology impacts the role of faculty.*

Other resources to help faculty integrate technology into their courses include newly developed software. Texas State Tech recently developed a software that matches student skills with what employees seek (Mangan, 2015). Colleges can use this software to align their curricula with what employers are seeking. The application will allow for the curricula of faculty to be uploaded and allow them to see how relevant the content being taught is to the available occupation (Mangan, 2015). This new software can help professors and instructors better align their courses with the skills students will need upon graduation. The software can also be used on the student end to "fine tune" their resumes. Students can upload their resumes or LinkedIn profile and the software can match them to occupations, the skills required, the wording that would catch employers' attention, salary averages, and the expected position openings by state (Mangan, 2015).

Some of Virginia Tech's efforts in this area include the Office of Technology-enhanced Learning and Online Strategies (TLOS), which has programs and services that assist with course development and provides support for computer integrated classrooms. Additionally, through workshops, certificates, and learning communities, TLOS offers training for faculty, staff, and students to integrate technology and increase technology

competencies (Virginia Tech, 2015). Some of the topic areas for training include online course design, online course-redesign, the flipped classroom with technology-enhanced course design, and technology-enhances learning community (Virginia Tech, 2015).

Diversity

There have been major student demographic shifts in higher education. Currently, there is a wide array of student characteristics on college campuses including: first-generation, international, 25 and older, etc. The student body has become more diverse for two primary reasons: national shifts in demographics and greater accessibility to education (e.g., international opportunities, online degree programs). US demographic trends between 2000 and 2010 demonstrate that there has been significant growth among minority groups. Some of the major increases have occurred among Asians (43%), Hispanics or Latinos (43%), Native Hawaiians and Other Pacific Islanders (35%) and those who identify to be of Two or More Races (32%) (US Census Bureau, 2010). By 2050, together all of these minority groups are expected to make up the majority of the US population; becoming a majority minority country (Pew Hispanic, 2012). Additionally, women now compromise more than 50 percent (57.3 %) of students enrolled in post-secondary institutions (US Department of Education, 2015). It is projected that this trend will continue and the gender gap will widen. *For more about student populations see Student Population white paper. The focus of this paper is on how the shift in student demographics impacts the role of faculty.*

This rapid diversification of students is making the label "traditional"[3] college student, obsolete (Williams, 2014). In 2014, the National Center for Educational Statistics reported that the total percent of minority students (total percentage of Latinos, African-Americans, Asian-Americans, Pacific Islanders and Native Americans) in public grade-schools was higher than the percent of White students. Simultaneously during this same year, California announced that the University of California schools had admitted more Latino than white students (University Herald, 2014). In fall 2014, women made up 57 percent of the total enrollment post-secondary population (NCES, 2013). It is projected that by 2023, women will make up 59 percent of the total post-secondary student population (NCES, 2013)

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[3] Traditional college student has historically been defined as young, white, male, and wealthy (Williams, 2014).

Simultaneously there are also international students on US college campuses that represent various ethnic, racial, and religious backgrounds (Austin & Sorcinelli, 2003). International students tend to pursue a higher education in the US, UK, Australia, and Canada (Choudaha & Chang, 2012). Between 2002 and 2009 the enrollment of international students grew at the rate of 13 percent (from 582,996 to 660,581) in the US, keeping its place as the lead country (Choudaha & Chang, 2012). In terms of absolute numbers, one-fifth of all international students are enrolled in a US institution (Choudaha & Chang, 2012). In the past ten years there has been continued growth of international students' enrollment at US institutions (see Figure 3). However, in comparison to the international students' growth rate in other countries the US experienced a steady decline in its rate of growth. Between 2002 and 2004 the percent of international students enrolled in institutions in the US decreased from 4 percent to 3 percent. Between 2004 and 2009 the enrollment percentage of these students remained at 3 percent in the US while the UK had an increase from 17 percent to 21 percent (Choudaha & Chang, 2012).

Figure 3: Number of International Students in Total Enrollment, by Hosting Countries, 2002-2009
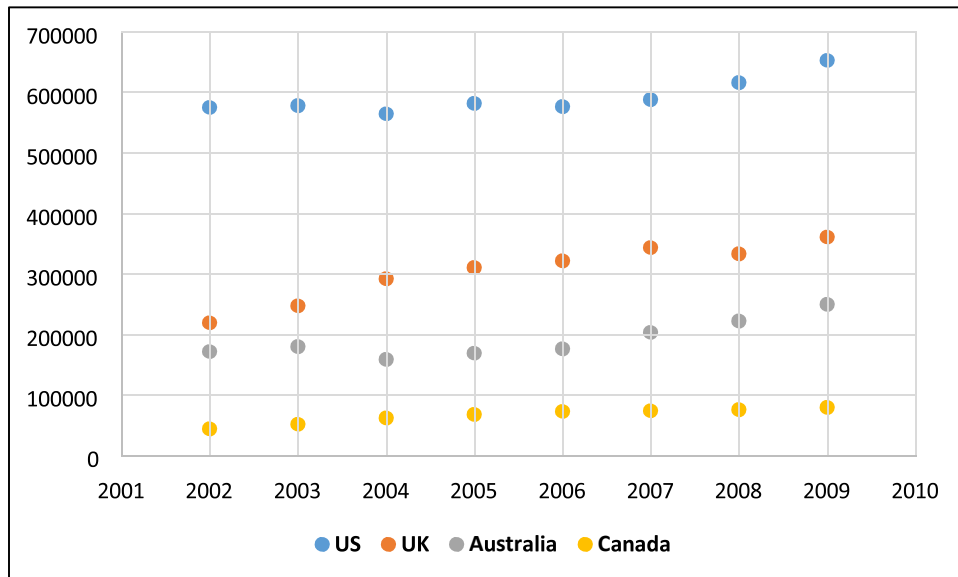
Source: Choudaha & Chang, 2012

The decline the US has experienced is due to increased competition between host countries. Some researchers recommend for higher education institutions to expand their recruitment efforts beyond China and India with special focus on emerging countries such as Sausi Arabia, Vietnam, Mexico, and Brazil (Choudaha & Chang, 2012).

Figure 4: Students Who Traveled to another Country for Higher Education in 2014
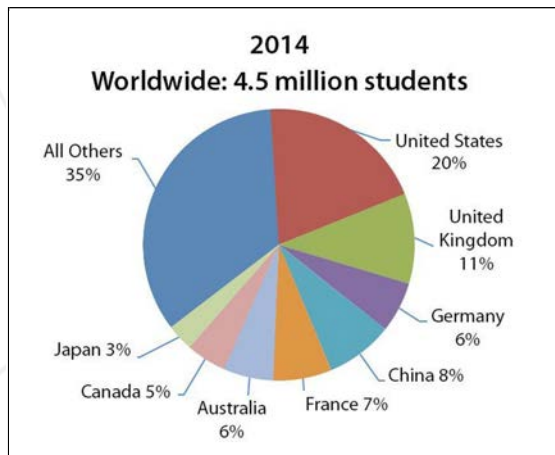
Source: Educational Testing Services, 2015

Learning environments are now infused with diverse students and technology that links the classroom to the world. This interconnection is only expected to continue developing in the coming years. In order to fully benefit, institutions need to find a way to leverage the international students on campus (Redden, 2015), and establish access to learning opportunities beyond the classroom. Faculty must find ways to create opportunities for students (especially those from abroad) to exchange their global perspective with local students. *For more about providing global learning opportunities see Global Land-Grant white paper. The focus of this paper is on how diversity of students impacts the role of faculty.*

Developing Cultural Competency

In this manner, faculty members must develop the capacity to serve students' diverse learning needs. Universities and colleges must provide faculty members with professional development opportunities that will help ensure the necessary institutional capacity needed to serve and reap the benefits of a highly diverse student body (Smith, 2009).

Some institutions have developed virtual research centers on topics of diversity. Earlier this year, Penn State University launched its Center for the Study of Equity and Race in Education, a virtual center. The center allows for faculty from various disciplines to collaborate on research. Additionally the center provides trainings for faculty, staff, and students on "discussing diversity issues in productive ways that promote learning, safety and respectability, and cross-cultural understanding" (The University of Pennsylvania, 2015).

Moreover, the center has made modules that focus on how to include racial equity in a research agenda for doctoral students in higher education, student affairs, and community college leadership programs. These modules, allow faculty members to collaborate across institutions nationwide and co-teach on subjects of diversity.

In 2011 Virginia Tech created the Diversity Development Institute (DDI). The institute has a structured curriculum for faculty, staff, and administrators to develop diversity competencies. Some of the topics included in the curriculum are diversity and inclusion, privilege and oppression, understanding the international student experience, and women in higher education. By having employees take these courses the institution seeks to create more inclusive work and learning communities. As we move into the future, Virginia Tech will have to increase opportunities for faculty to develop cultural competencies and implement these into their teaching.

Interdisciplinarity

It is often argued that we need interdisciplinary approaches to solve the big problems of the world. Within the last 20 years institutions have articulated their goal of adopting interdisciplinarity (Sa, 2008). Faculty and students are encouraged by some institutions to do work across disciplines through research and courses. More specifically, institutions have created a wide selection of interdisciplinary programs. These programs and courses allow for students to be "educated for change" and prepared for global challenges. Students are asked to work on real problems, requiring them to strategize in producing solutions across borders (Lash, 2012). By expanding students' breath of education, they will be better equipped to think about major problems, making them prepared for an interconnected world.

An example is Brown University's new doctoral interdisciplinary program. Last year, the university had a cohort of doctoral students test a new interdisciplinary model. Students were allowed to pair their PhD with another advanced degree in an unrelated field

(Patel, 2014). The institution believed that this would allow students to think in different ways about world problems. The program received a $2 million grant from the Andrew W. Mellon Foundation (Patel, 2014). Brown University used this grant along with some of its own funding to provide stipends for graduate students under this model. As a result, the students received an additional year of stipend support and tuition for their master's degree.

The program at Brown University and others require faculty to collaborate across departments. In some programs, faculty collaborate to create courses and team teach classes. In this manner, interdisciplinarity fosters an environment for faculty to collaborate across disciplines in other aspects beyond teaching (e.g., research). In spite of all the benefits of interdisciplinary work, faculty face barriers when collaborating across disciplines. Faculty doing this work are often challenged when being evaluated for funding proposals, manuscripts for publication, and the recognition of publications by disciplines (Sa, 2008). Finding journals that accept interdisciplinary research can be challenging, making it harder for faculty to get published. Furthermore, these challenges are often a result of institutions having limited resource allocation and credit systems that do not reward interdisciplinary work, especially in the promotion and tenure processes. Under these conditions, the lack of incentives and evaluation mechanics can make it especially challenging for pre-tenured faculty to do interdisciplinary work.

Furthermore, university rankings fail to include a measurement for interdisciplinary research and teaching at institutions. For example, Times Higher Education (THE) uses 13 performance indicators that are grouped into five areas:

- Teaching: the learning environment (worth 30 per cent of the overall ranking score)
- Research: volume, income and reputation (worth 30 per cent)
- Citations: research influence (worth 30 per cent)
- Industry income: innovation (worth 2.5 per cent)
- International outlook: staff, students and research (worth 7.5 per cent) (THE, 2015)

Previous research has demonstrated that collaborative co-authored papers have higher citations rated than single authored papers (Aksnes, 2003). Papers with international co- authors have even higher citations ratings than those with co-authors from the same country (Aksnes, 2003). Although, co-authorship rewards collaboration in research, it is not

necessarily always *interdisciplinary* work. Without any external measure for interdisciplinary work, it is difficult for universities to be incentivized and create rewarding systems for faculty working across disciplines. *For more about world university rankings see Characteristics of Highly Ranked Universities in Times Higher Education (THE) World University Rankings white paper. The focus of this paper is on how interdisciplinarity impacts the role of faculty.*

With these challenges in mind, it becomes important for institutions to recognize that this type of work may not be valued under the traditional structures: externally (e.g., world rankings) or internally (e.g., institutional value systems). Nonetheless, there is much value in interdisciplinary work and if institutions want to support it, they must begin by developing internal systems that incentivize and reward faculty doing this type of research and teaching.

Some solutions to these challenges have resulted in institutions creating research centers dedicated to interdisciplinary work and funding programs (e.g., "seed grants") for the sole purpose of supporting this type of research. Other strategies have also involved conducting interdisciplinary cluster hires that use search committees composed of faculty from various departments.

Working across Disciplinary Borders

As interdisciplinary work becomes more prominent in higher education, faculty will be urged to collaborate with colleagues across disciplines on teaching and research. In addition to universities and colleges changing their support for interdisciplinary work, they will need to equip their faculty with the necessary skills to engage in this type of research. "Successful interdisciplinary efforts require mastery of specific competencies that can be learned and improved" (Larson, Landers, & Begg, 2011, p.38).

In 2004, researchers conducted a study to identify the competencies needed to conduct interdisciplinary work. A Delphi survey was administered to national experts in interdisciplinary research. The survey asked participants to identify the necessary core competencies needed to successfully conduct interdisciplinary research (Larson, Landers, & Begg, 2011). Based on the information collected from this survey, a school of nursing and public health at a single university created a course to teach graduate students and faculty members from various disciplines material that would allow them to develop 17 core competencies for interdisciplinary research.

Figure 5: Core Competencies for Interdisciplinary Research

Major Area	Competencies
Conducting research	• Use theories and methods of multiple disciplines in developing integrated theoretical and research frameworks.
	• Integrate concepts and methods from multiple disciplines in designing interdisciplinary research protocols.
	• Investigate hypotheses through interdisciplinary research.
	• Draft funding proposals for interdisciplinary research programs in partnership with scholars from other disciplines.
	• Disseminate interdisciplinary research results both within and outside his or her discipline.
	• Author publications with scholars from other disciplines.
Communication	• Advocate interdisciplinary research in developing initiatives within a substantive area of study.
	• Express respect for the perspectives of other disciplines.
	• Read journals outside of his or her discipline.
	• Communicate regularly with scholars from multiple disciplines.
	• Share research from his or her discipline in language meaningful to an interdisciplinary team.
	• Modify his or her own work or research agenda as a result of interactions with colleagues from fields other than his or her own.
	• Present interdisciplinary research at venues representing more than one discipline.
Interacting with others	• Engage colleagues from other disciplines to gain their perspectives on research problems.
	• Interact in training exercises with scholars from other disciplines.
	• Attend scholarly presentations by members of other disciplines.
	• Collaborate respectfully and equitably with scholars from other disciplines to develop interdisciplinary research frameworks.

Source: Larson, Landers, & Begg, 2011

Looking Ahead

As the shifts in higher education require faculty to enhance their skill sets, institutions will need to advance the necessary programs and resources to deliver high-quality faculty development. Historically, faculty development has been centralized and handled university-wide by offices on campus. However, in the last ten years faculty development has been at the department or unit level. (Austin & Sorcinelli, 2013). In the future, higher education institutions will need to consider other possibilities for how to organizationally structure faculty development. Options may include having departments and individuals head their own faculty development and creating networks with external organizations (Austin & Sorcinelli, 2013). Some literature points to the need for higher education institutions to partner with national accreditation bodies and other associations to further agendas that

would improve the experiences of students and faculty (Austin & Sorcinelli, 2013). As Virginia Tech prepares for 2047, it too will need to plan not only the content needed to develop faculty, but also how this development will be delivered.

Future research to aid Virginia Tech during its visioning process may include an investigation of faculty salaries and how these have changed during the last ten years. Research in this area would help our institution understand where we stand in comparison to our peers and if we are funding our talent to the necessary degree. Additionally, as Virginia Tech seeks to prepare for its 175th anniversary, it becomes important to pay attention to world university rankings. Although, world rankings are not inclusive of the wide array of institutions, they can be used as one type of metric to compare our performance to other universities. Based on our rankings, the question then becomes in what ways can Virginia Tech further invest in faculty members and their development to help us achieve greater institutional excellence and quality and higher rankings as a byproduct? How do the trends that we see in the changing landscape of higher education affect recruitment and quality of faculty and in turn, the quality of the institution?

This paper discusses the role faculty will have in the future, of which some is influenced by the changing characteristics of students. Therefore, other areas of research may include the types of skills students will need to have in 2047 and the subsequent changes Virginia Tech faculty will need to make in curriculum and pedagogical approaches. What kinds of student and faculty interactions are needed for students to learn and develop the necessary competencies for the future?

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