BEYOND BOUNDARIES

PREPARING STUDENTS FOR THE WORLD IN WHICH THEY WILL LIVE AND WORK

THEMATIC AREA GROUP REPORT

PREPARED BY:

Elsa Camargo

Office of the Senior Fellow for Resource Development

May 5, 2016

VirginiaTech®

Virginia Tech graduates of 2047 will be globally recognized for tackling the 21st century's biggest challenges, for example: social and economic inequality, climate change, public health, and expanding the human imagination. They will embody the necessary combination of expert depth and collaborative breadth to thrive in a world that is more global, more mediated by technology, more mobile, more specialized, and more networked. They will be technologically-savvy, adaptive to change, and responsive to uncertainty. "VT-shaped" graduates will stand apart, however, for their unparalleled capacity for purpose-driven engagement in the communities that they serve.

To assure that *all* students have the opportunity to develop VT-shaped capacities, we will organize in Communities of Discovery. In these environments, students, faculty, external partners, and other citizens will collaborate around natural affinities to address substantial issues of mutual concern. Through these environments, students will be supported in deep mentoring relationships. This vision builds on Virginia Tech's 175 year record of *Ut Prosim* and its areas of emergent interdisciplinary and transdisciplinary work and purpose-driven strengths. Our proposal's ambition is one of scale—to make the university's most exemplary approaches for preparing students the experience of every Virginia Tech student across all fields of study.

Our Committee's Work

This report results from six months of intense discussions among a diverse cross-section of university representatives, and includes feedback from students, and engagement with key stakeholders such as Faculty Senate, and conversations with other working groups. We were charged to generate aspirational "moonshot" ideas of what Virginia Tech might achieve one generation from now, and then to find implementation instruments with which to actualize that future.

Our conversations expanded from the exploration of meaningful learning experiences in group members' own lives, to distinctions between fads and deep forces in how we envision the world in which graduates of 2047 will live and work. The emphasis throughout was on how Virginia Tech could identify and enhance its distinguishing strengths in a future defined by global interconnection.

Guiding Principles

Our vision of VT-shaped graduates trained in Communities of Discovery is driven by three core principles.

Person-centered. A Virginia Tech education engages the whole person. Its foundations are high-quality and inclusive connections that contribute to the value of each person and the group as a whole. Formal and organic mentoring between faculty and students, alumni and student interns, or groups of peers is a defining feature. Students include contributors of all ages. Exploration happens in collaboration across fields. Through intentional learning and practice around human interaction, students develop capacities of *empathy* and *virtue* essential to *Ut Prosim*.

Inclusive. We envision access to exemplary education experiences for ALL Virginia Tech students and to full inclusion of future students. We believe that the diversity students bring with them to the university must be used to design learning opportunities and environments on campus. We value experiences of learning through difference.
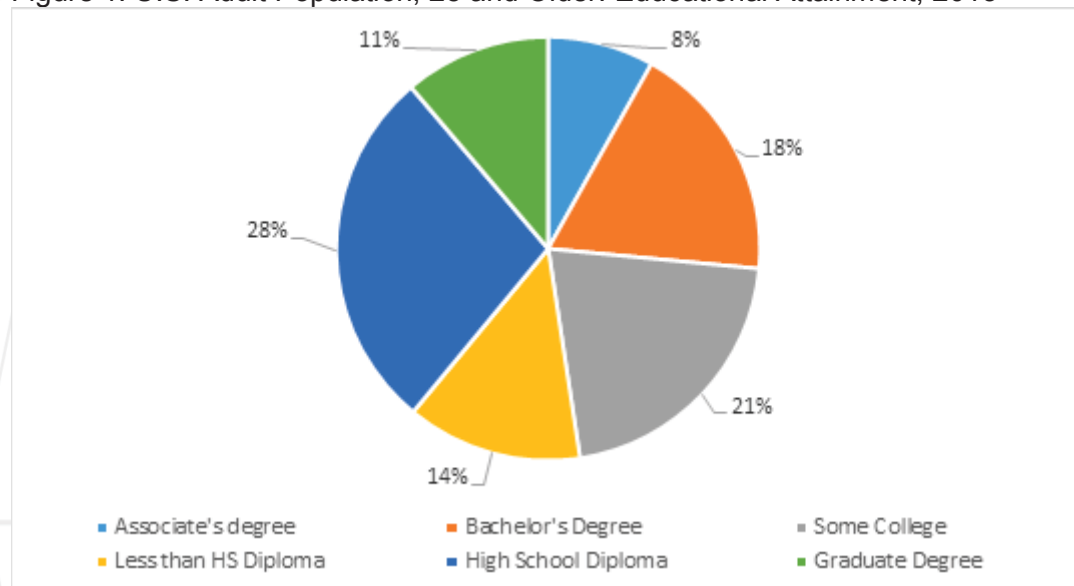
Flexible. Acknowledging the different paths that a student may have taken to Virginia Tech and envisioning highly individualized programs of study, we commit to flexible and adaptive educational structures that meet the unique needs of students in ways that scale.

Envisioning 2047

Our group considered the deep forces (as opposed to fads and trends) that we believed were likely to shape the world in 30 years. Demographic information and forecasts for the next few decades show that the population is expected to grow causing communities to become denser. In 2014, the U.S. Census Bureau (2015) reported that 23 million individuals were under the age of five. This projected population growth is in turn expected to increase the traditional college student population (18-24 year old) by 2032 (Hundley, 2015).

The "traditional college student" is also likely to change (e.g., older and with a completed career) requiring more flexible curricula. According to the U.S. Census Bureau (2013), approximately 63 percent of individuals 25 and older had not completed a postsecondary degree. Of this population, only 18 percent had earned a bachelor's degree and 8 percent an associate's degree (U.S. Census Bureau, 2013). As the job market requires individuals to have post-secondary credentials, older individuals are likelier to consider returning to school, leading to an increase of adult learners among the college population (Hundley, 2015). [1]

Figure 1. U.S. Adult Population, 25 and Older: Educational Attainment, 2013

11% — 8%
18%
28% —
21%
14%

- Associate's degree
- Bachelor's Degree
- Some College
- Less than HS Diploma
- High School Diploma
- Graduate Degree

Source: U.S. Census Bureau, American FactFinder (2015)

The world will be more interconnected with an increased use of technology and greater exchange between cultures. As the process of globalization continues into 2047, students will require global learning experiences and deeper learning about diversity and inclusion. The growth of minority populations in the U.S. (NCES, 2013; U.S. Census Bureau, 2010) and international students (Choudaha & Chang, 2012) will create educational environments with

---

[1] For more information of student demographic shifts in higher education see the white paper entitled, *Considering Student Population Trends for Virginia Tech's Future,* by Meredith Hundley.

culturally rich student-to student and student-to-faculty interactions. In addition, participants discussed current scientific expertise that indicates that climate change is another deep force. Other forces that are likely to impact the world are economic inequality. As a result, there is speculation that higher education may become harder to access.

All of these forces will foster an educational model that will include an increase in cross-disciplinary majors and experiential learning with the goal of preparing a citizenry and workforce fully equipped to address complex issues facing the world in 2047.

VT-Shaped Students

What characteristics must Virginia Tech graduates have to be prepared for work and life in 2047?

First, graduates must be people with a developed depth of expertise in a particular domain. Although existing disciplines will evolve and new ones will emerge, they will remain a core part of higher learning. In this aspect of their learning, students will still need mentoring by disciplinary experts to develop the knowledge base, the skills, and to be immersed in the culture that unifies a particular field of study.

But even in 2016, we know that disciplinary depth alone is insufficient to prepare a student to become a productive contributor in society. Wicked problems and challenges require the capacity to work in interdisciplinary teams, engage in critical and creative thinking, collaborate with diverse people communicate effectively, and conduct oneself by a deep sense of ethics. In 2047, graduates will need to be even more technologically savvy and adaptive to change and uncertainty.

This combination of disciplinary depth and interdisciplinary capacities defines the T-shaped learner, a term in common practice today and the aspiration of many contemporary institutes of higher learning (Wladawsky-Berger, 2015). The vertical bar represents the disciplinary depth and the horizontal bar the interdisciplinary capacities of the graduate (see figure 2). A T-shaped education is congruent with the skills and capacities that employers are seeking in recent college graduates (Association of American Colleges & Universities, 2015).

Figure 2: T-Shaped Student
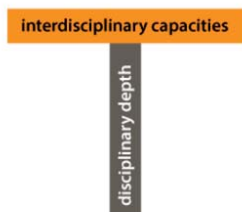
However, we believe that Virginia Tech is uniquely positioned to offer a holistic and experiential education that engages the whole person, beyond the framework of the T. We envision that a Virginia Tech education in 2047 will be grounded in work and learning that is purpose-driven, a manifestation of *Ut Prosim* and the land-grant mission that is no longer just co-curricular but embedded in and indeed integral to the curriculum.

One needs to look no further than the work of Dr. Marc Edwards, Professor in Civil Environmental Engineering, and his students in Flint Michigan to understand what we mean. What if every Virginia Tech student were engaged in purpose-driven work like this and built their

curriculum around this work? This experience and the capacity to work in communities, learning through diversity and difference and with passion and empathy provides the "V" in what we and others have termed the "VT-shaped student." This will be the distinguishing feature of a Virginia Tech education in 2047.

Students will study and solve important societal problems and graduate with the skills to be active global citizens. *Ut Prosim* will be projected to the world. The conventional elements of learning, whether they are calculus or composition, will become accessible to students as needed in ways that are adaptive and that facilitate rather than compete with their engagement in purpose-driven learning. Curriculum will need to be more flexible so that students can learn what they need anytime and wherever in the world they are engaged in purpose-driven learning.

A Moonshot of Scale
In developing the vision of the VT-shaped student, our committee derived inspiration from many tremendous current examples where Virginia Tech students were engaged in purpose-driven learning for some portion of their formal or informal education. Examples included:

- The collaborative work with community partners by students in the Civic Agriculture and Food System minor.
- The fostering of T-shaped learning through peer-to-peer projects in the DaVinci and Curie STEM living learning communities.
- The engagement in service learning projects by student athletes in the Dominican Republic.
- The deep mentoring and collaboration among students and faculty co-creating a theater production.
- The generation of authentic artifacts of learning through studio-based programs like industrial design.

As committee members shared these and other examples of purpose-driven learning, we recognized that we already graduated VT-shaped students, albeit relatively few, in programs that were highly experiential, experimental, and labors of love for the participating faculty, staff and students. Thus, our moonshot became the scaling of these capacities so that every Virginia Tech students is engaged in purpose-driven learning as the cornerstone of their Virginia Tech education.

Implementation: Communities of Discovery
As an implementation instrument toward reaching the moonshot of a VT-shaped education for all of our students, our committee developed the concept of Communities of Discovery. Regardless of age, gender, or origin, learners enter Virginia Tech seek meaning. They come to find a craft, to contribute to scientific research, to imagine new technologies, to start new companies, to realize themselves, and to understand and strengthen their communities.

We defined Communities of Discovery as environments where students, faculty, external partners, and other citizens would collaborate together on an issue of mutual interest such as clean water, feeding the world, or curing cancer. The key goal of these types of learning communities is to encourage learning across courses and beyond the classroom, and involve students in addressing big problems (Kuh, 2008). Learning takes place not in the head or outside, but rather "in the relationship between the person and the world" (Wenger, 2010). In

this manner networks composed of various individuals are created through continuous interactions.

In these Communities of Discovery, students will learn from each other and from the community. We believe that providing something to communities is an educational outcome and that working with communities is preparation for citizenship (Kuh, 2008). Mentors will abound in relationships that are deep and develop over time through shared experiences in purpose-driven work. Communities of Discovery demand intentional engagement with complex-issue based projects to cultivate the mindsets and tools that will foster meaningful participation throughout graduates' lives. By collaborating with others to solve problems, students will develop valuable skills to handle unscripted problems throughout life (Kuh, Kinzie, Schuh, & Whitt, 2011).

These self-reinforcing communities might consist of ~150 members, diverse in all conceivable ways, which operate functionally in working groups of 15 people (10 groups per community). There would be multiple communities centered on the same issue as well as cross-fertilizations across different communities. A community will be constructed with all of the necessary capacities: intellectual, financial, human, social, and cultural.

These communities will be diverse in every conceivable way such that students will learn through difference. Communities allow for students to explore cultures and worldviews. They will disrupt existing hierarchy in higher education by engaging people across all levels of education—K-12, undergraduate, graduate, faculty, and individuals outside of Virginia Tech. Moreover, we imagine students and faculty will be part of communities that may be in Blacksburg, Virginia, or anywhere in the world with enabling technologies to connect work and learning across physical locations.

Boundaries and Challenges

As our committee imagined the VT-shaped graduate beyond boundaries, we considered those obstacles to achieving our vision.

- Some organizational elements that exist today will continue to serve in this new model of learning. Departments or some kind of disciplinary unit organized around deep

knowledge will still serve as a place for people to come together to gain and share expertise, resources, and culture. Institutes may serve as entities that provide support and resources to communities working on particular issues.

However, the organization of curricula and distribution of teaching resources around discrete disciplinary "pockets" of learning may prove to be a barrier to development of interdisciplinary and collaborative learning experiences. The current curricular, credit-bearing structure is not a good fit for this work, and is a barrier to facile collaborations between Academic and Student Affairs.

- As we move towards interdisciplinary teams, the university needs to reconsider the role of faculty: their new role as interdisciplinary team managers, the place of individually evaluated research, and the purpose of tenure.

- Likewise, the role of faculty and others in teaching, particularly in supporting purpose-driven learning, which can be resource intensive, needs to be reconsidered, including the rewards for this work.

- In preparing VT-shaped students to tackle world problems, the university will have to examine how accessibility and affordability must be advanced to create and maintain a diverse university that graduates well-rounded individuals. The value on experience includes more than just job prospects upon graduation.

- The need to credential students and document their learning remains a responsibility of the university, and employers and graduate schools will still need to recognize the information provided in some version of academic transcript. The participation of students in interdisciplinary, purpose-driven learning begs for a richer form of evaluation than the short hand that a transcript of grades in courses with credit hours currently provides. How will the university demonstrate and credential student achievement across all dimensions of a VT-shaped education? How does a richer system of evaluation scale to 30,000+ students?

Inclusive Implementation

The aspirations for helping every student become a VT-shaped graduate are clear and compelling. We know the future will privilege engaged participation in education and in professional work. For Virginia Tech to be at the forefront of training global leaders, we must create a pathway for the development of Communities of Discovery. We must develop and utilize technology in support of—rather than as a conceptual barrier to—human-centered learning. We must attract, support, and reward educators who help to build Communities of Discovery. These are questions the university community will solve together.

References

Association of American Colleges & Universities. (2015). *Falling short? College learning and career success.* Retrieved from: https://www.aacu.org

Choudaha, R., & Chang, L. (2012). Trends in international student mobility. *World Education News & Reviews*, *25*(2), 1-22.

Hundley, M. (2015). Considering student population trends for Virginia Tech's future. Retrieved from Envisioning Virginia Tech Beyond Boundaries website: http://www.beyondboundaries.vt.edu/assets/student-populations.pdf

Kuh, G.D. (2008). High-impact educational practices: What they are, who has access to them, and why they matter? Association of American Colleges & Universities Report. Retrieved from http://www.aacu.org/

Kuh, G. D., Kinzie, J., Schuh, J. H., & Whitt, E. J. (2011). *Student success in college: Creating conditions that matter*. John Wiley & Sons.

NCES. (2013). Total fall enrollment in degree-granting postsecondary institutions, by attendance status, sex of student, and control of institution: Selected years, 1947 through 2023. *Digest of Education Statistics*. Retrieved from http://nces.ed.gov/programs/digest/d13/tables/dt13_303.10.asp

US Census Bureau. (2010). US census data. Retrieved from http://www.census.gov/2010census/data/

U.S. Department of Commerce. United States Census Bureau. (2015). *U.S. Census Bureau, 2014 American Community Survey 1-Year estimates: Population under 18 years by age.* Retrieved from http://factfinder.census.gov/bkmk/table/1.0/en/ACS/14_1YR/B09001

Wenger, E. (2010). Communities of practice and social learning systems: the career of a concept. In *Social Learning Systems and Communities of Practice* (pp. 179-198). Springer London.

Preparing Students for the World in which they will Live and Work Group Members

Co-Chairs

Jill Sible

Professor, Biological Sciences and Assistant Provost for Undergraduate Education

Matt Wisnioski

Associate Professor, Science and Technology in Society

Members

Stephanie Adams

Professor, Engineering Education

Kevin Carlson

Professor and Department Head, Management

Susan Clark

Associate Professor, Horticulture

Rafael Davalos

Professor, Biomedical Engineering and Mechanics

Ed Dorsa

Associate Professor, Industrial Design

Noha Elsherbiny

Graduate Student, Computer Science and Application

Juan Espinosa

Associate Director, Undergraduate Admissions

Sarah Karpanty

Associate Professor, Fish and Wildlife Conservation

Stephanie Lang

Director of Academic Programs, College of Natural Resources and Environment

Najla Mouchrek

Graduate Student, Human Centered Design

Emily Neer

Undergraduate Student, Psychology

Daniel Pierce-Parra

Undergraduate Student, Political Science

Preparing Students for the World in which they will Live and Work Group Members

Patty Raun
Director, School of Performing Arts
Angela Simmons
Assistant Vice President for Student Affairs
Danny White
Assistant Athletics Director, Student-Athlete Development