

Heightening the University of Wyoming's Societal Impact Through Interdisciplinary Education, Research, Scholarship, and Engagement

Report from the Interdisciplinary Pillar Group

April 30, 2021

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I. Introduction and Overview

a. Objective, Background, and Motivation

The objective of this strategic document is to identify ways to augment the University of Wyoming's practices and culture to position the university to lead and be sought as an outstanding partner in research, scholarship, education, and engagement pertaining to the most pressing and complex problems facing Wyoming, the nation, and the globe. At the heart of this effort is learning to draw upon many disciplines to approach these problems, and to have researchers and scholars collaborate in inter-, multi-, or transdisciplinary ways, understanding that the nature of the solution sought varies by the nature of the problem matter.

In this report, we refer to “interdisciplinary” as a proxy for the range of approaches generally called inter-, multi-, and transdisciplinary, recognizing that in practice, teachers and researchers will make fine distinctions beyond what is possible here.

In any of these cases, the virtue of an interdisciplinary approach to teaching, research, and engagement is that it works—the most complex questions we can ask and the thorniest problems we face, are best approached by a diversity of perspectives and methods. The world needs citizens with broad, inclusive perspectives; to thrive in today's workplaces, UW graduates need a worldview that is adaptive, agile, and well-rounded. Confronting problems that demand interdisciplinary approaches will have profound impacts on the curricula as well, yielding great value to students as their education is framed around issues of great complexity, bringing forward in them a skill set to enable them to succeed in complex environments, a resiliency of high value as they enter a disruptive, rapidly evolving world. Interdisciplinarity is not an end; rather, it is a means for asking profound questions and addressing complex challenges that enable the institution and society to move towards solutions that are as complete and sustainable as possible.

This group explored programs, infrastructure, and organizational structures needed to build out the foundations for interdisciplinary research, scholarship, education, and engagement. Importantly, the group also discussed both incentives and disincentives for regarding interdisciplinarity across UW. Disincentives and obstacles in fact emerged as a major topic of discussion.

The group understands that this report is a snapshot in time of the state of our discussions and realizes that not only do they need to continue, but that the sharing of it will generate plenty of discussion throughout campus that will further inform our approach. Areas that we anticipate developing further include the role of communities of practice and knowledge networks, informal aggregates that can percolate with ideas absent of formal structures. There is also the

need to perform an inventory of assets that we have on campus that can serve as raw materials to build on when developing a vibrant, more interdisciplinary future.

Background and Motivation: A National Perspective

C. P. Magrath writes that the land grant university does three things:

1. It organizes itself to respond to the needs of today's students and tomorrow's, not yesterday's;
2. It enriches students' experiences by bringing research and engagement into the curriculum and offering practical opportunities for students to prepare for the world they will enter;
3. It puts critical resources (knowledge and expertise) to work—in partnership with the community—on the problems they face (p. viii).¹

A university with a high priority of embracing interdisciplinary education grounded in research and scholarship has the potential for excelling in all three domains.

Wyoming and the world face challenges for which the solutions can only be found through interdisciplinary collaboration. That universities need to extend beyond disciplinary bounds to examine and revise their approaches to finding these solutions has also been recognized at the highest levels. For example, the National Academies have addressed the necessity and challenges of transdisciplinary research in two studies, one in 2004, and another in 2014. The 2014 study, titled "Convergence: Facilitating Transdisciplinary Integration of Life Sciences, Physical Sciences, Engineering, and Beyond" focuses in part on lessons learned at research institutions from across the country in the intervening decade.

The challenge of meeting interdisciplinary research problems head-on has prompted a wide array of responses at universities. Many responses have been incremental. For example, some universities have instituted policy changes related to faculty performance, tenure, and promotion to ensure that transdisciplinary research is rewarded properly when an academic department's de facto interests may understandably be discipline specific. At the other extreme, complete restructuring of academic units has been undertaken. Arizona State University's president led the complete dismantling of its previous departmental structure in favor of cross-cutting units and reward structures centered on societally important, transdisciplinary challenges. Between these extremes, many universities have promoted the formation of transdisciplinary research centers and institutes that draw upon expertise from across their campuses. Considerable effort has identified and tackled obstacles and developed policies and practices to make such enterprises

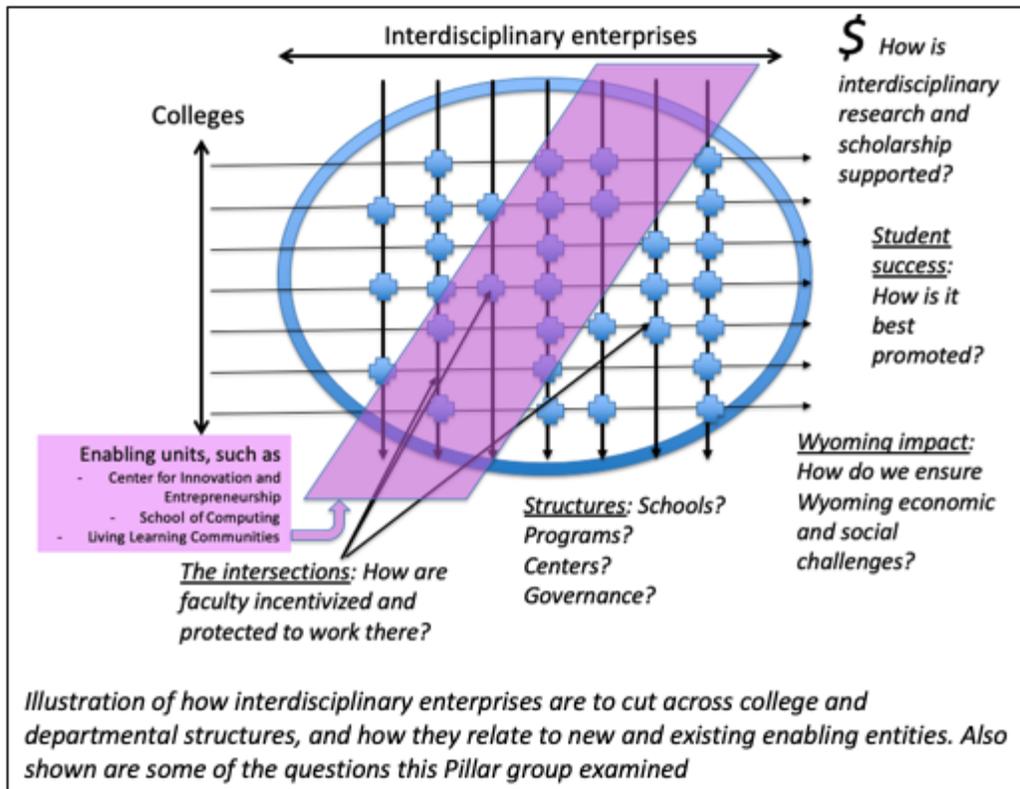
¹ Magrath, C.P. (2018) "Forward" in S.M. Gavazzi and E.G. Gee. Land-Grant Universities for the Future: Higher Education for the Public Good. Baltimore: Johns Hopkins University Press: p. vii-viii.

work effectively within existing departmental and college structures. Concepts proposed here will be designed to lay the groundwork for establishing or reinvigorating such centers and institutes.

Interdisciplinarity means for us a range of methodological approaches and perspectives—again, here we incorporate inter-, multi-, and transdisciplinary definitions—each of which can produce valuable results. We can see this methodological diversity in every branch of knowledge production in the health sciences and social sciences, in basic and applied sciences, the humanities and the arts, and in the professions. In the science disciplines, interdisciplinary research enterprises are supported at national policy levels, and this has found its way into national program priorities and funding. Examples include the National Science Foundation launching in 2017 a \$17.7M program in “Transdisciplinary Research in Principles of Data Science” (TRIPODS), which has funded 12 institutions. More recently, NSF issued a call for proposals for “Research Centers for Mathematics of Complex Biological Systems” (MathBioSys, 2018), as well as “Innovations at the Nexus of Food, Energy, and Water Systems” (INFEWS, 2018). And recently, NSF created a new structure called the “NSF Convergence Accelerator” (<https://www.nsf.gov/od/oia/convergence-accelerator/>) with the aim of bringing leaders from academia, business, and government to the table to generate ideas and move towards solutions in areas of great complexity and potentially high societal impact.

In the humanities, social sciences, and arts disciplines, interdisciplinary opportunities are a major focus, for example, at the National Endowment for the Arts (NEA). Its five-year research agenda (2017 – 2021) emphasizes the interface and overlap of social scientific and behavioral research. This includes support from NEA for research labs focusing on arts, entrepreneurship, and innovation, as well as arts, health, and social/emotional well-being. Similarly, the report from the American Academy of Arts and Sciences (AAAS), “Our Common Purpose, states: Reinventing American Democracy for the 21st Century” notes that “few problems have only one cause. The challenges facing the nation’s constitutional democracy are not the result of single events, specific elections, or one set of decisions. Data about the state of political and civic life in the United States, along with the nearly fifty conversations that the Commission held with Americans across the country, reveal that there is a multitude of factors that impact how people interact with their neighbors, their civic institutions, and their government. These factors are the result of many forces, some of them entirely local in nature, whereas others are global and systemic.” Among the AAAS report recommendations is to “activate a range of funders to invest in the leadership capacity of the so-called civic one million: the catalytic leaders who drive civic renewal in communities around the country. Use this funding to encourage these leaders to support innovations in bridge-building and participatory constitutional democracy.” Furthermore, any attempt to understand how the history and culture of race, class, and gender have shaped our systems and political and economic institutions would benefit from an intersectional approach, recognizing that at some level, our human experiences are connected.

The National Institutes of Health (NIH) supports regional coalitions of academic institutions, community organizations, service providers and systems, agencies, and other stakeholders focused on minority health and health disparities through its “Transdisciplinary Collaborative Centers for Health Disparities Research” program, linking STEM-based health sciences research and social issues. Many such centers exist nationally, often receiving funding of several million dollars over three to five years.



The University of Wyoming has many elements that support to some degree— or even have in their charter—² an education for life and a career. For example, the very name of the College of Arts and Sciences indicates its founding on the Humboldtian philosophy of a diverse approach to knowledge production and dissemination. In similar ways, the Haub School in Environment and Natural Resources, the School of Energy Resources, the Program in Ecology, the Honors College, the Department of Philosophy and Religious Studies, Global Engagement’s “UW in Scotland” program, and the School of Culture, Gender, and Social Justice—just to name a select

² □ Alexander von Humboldt wrote: “There are undeniably certain kinds of knowledge that must be of a general nature and, more importantly, a certain cultivation of the mind and character that nobody can afford to be without. People obviously cannot be good craftworkers, merchants, soldiers or businessmen unless, regardless of their occupation, they are good, upstanding and – according to their condition – well-informed human beings and citizens. If this basis is laid through schooling, vocational skills are easily acquired later on, and a person is always free to move from one occupation to another, as so often happens in life.” Quoted in Günther, KH. “Profiles of Educators: Wilhelm von Humboldt” (1767–1835). *Prospects* 18, 127–136 (1988). <https://doi.org/10.1007/BF02192965>

few examples—feature some of the best current approaches to interdisciplinary work on campus in their design. Also, in part because some of the departments have few faculty members, reaching across departmental lines in research and scholarship is necessary for some faculty to have any benefit of interchange with colleagues. All that said, a clear, consensus observation of this pillar group is that much interdisciplinary research and scholarship occurs in spite of, and not because of, UW practices, policy, and culture.

A diagram (above) illustrates how interdisciplinarity is aimed to engage with the colleges, departments, and other units, and some of the questions that this pillar group sought to explore, were captured in a graphic shared at the beginning of the process. With colleges and departments depicted horizontally, the goal is to have interdisciplinary enterprises ranging from those that engage just a couple of units to Grand Challenges that encompass most or all of the colleges (vertical lines), prompting questions that include: how are these interdisciplinary enterprises to be administered? Should they be schools, centers, institutes, or a mix? How do we best ensure transformative student impact? How is student success best promoted with interdisciplinary enterprises? How are faculty protected and incentivized to participate in interdisciplinary work? How can we assure the economic and social impact on Wyoming? And importantly, what are the business models for these enterprises? How are they stood up and led to a place of financial self-sufficiency? All these topics were discussed to some degree, with recommendations made that are relevant to most. While this report is only a beginning of a process, it does include action items that can be taken soon on which we can build, and from which we will continue to learn.

Related to the question of incentivizing interdisciplinary research and scholarship and ensuring professional safety in participating, a singularly strong sentiment emerged:

Obstacles to pursuing interdisciplinary research centered in UW practices, policy, and culture are within our power to change. The creation of supportive practices, policies, and structures for interdisciplinary research and scholarship will empower us to tackle society's most challenging problems.

As reflected in the recommendations, the discussions led to what has become a clear recognition of the exciting potential of engaging our students in activities surrounding great challenges that demand an interdisciplinary approach, and that thoughtful consideration be given to the related matter of infusing interdisciplinary opportunities into the core curricula. Recommendations also emerged from this pillar's activities for how to imbed this opportunity in the lives of first-year students, through living-learning communities, and how to connect these activities to research and scholarship enabled by a new graduate school to help them become threads that are part of every year of an undergraduate's experience. Strong consensus also crystallized around the recognition that executing on the importance and opportunity imbedded in the concept of interdisciplinarity requires new administrative structures, including an interdisciplinary incubator that is administered at a level above the colleges, and that the administration of our most

complex, wide-ranging problems, identified as Grand Challenges, should take place in institutes that cut across college and departmental lines.

Interdisciplinary research will add substantial value to state-supported initiatives underway at UW, and will benefit greatly from them as well. For example, many interdisciplinary challenges will have as their most complete solution a strong engineering component. The Tier 1 Engineering Initiative promises to provide a platform of disciplinary excellence in engineering that will bring strength to many of the interdisciplinary challenges the university pursues. Engineering graduates will come to be known as understanding the larger, complex context in which their disciplines reside and will be sought by and valued by prospective employers. The Science Initiative is grounded in the premise that Wyoming's biology, wildlife, and water systems are best understood in an interdisciplinary framework. There is great potential of serving Wyoming's interests by educating students in the interconnected ways in which the disciplines in the life sciences are manifest. Overlap and constructive engagement with the interests of the Digital Pillar of both Tier 1 Engineering and the Science Initiative are exceptionally strong. This is apparent by considering the plans for the Center for Advanced Science Imaging (CASI) in the Science Initiative Buildings. The CASI will be home to research for which state-of-the-art imaging of many sorts will be performed and will require transfer and storage of tremendous amounts of data that will be enabled by an institutional commitment to the infrastructure required to allow the Digital Pillar to succeed. Finally, the discussions represented in this document on the relationships between interdisciplinary research and scholarship, and its potential impact on education through curricula as well as living-learning communities, will provide a creative force that will advance the interests of the Trustees Education Initiative, including its emphases on career exploration and experiential learning.

The university now seeks to elevate interdisciplinarity to one of several foundational pillars on which the future UW is based. In the last two years, identifying great societal challenges demanding a transdisciplinary focus has been the center of activity of many on campus. A grassroots campus-wide process led to the emergence of five broad areas of great interest and of high relevance to Wyoming and beyond. This effort added to the assets already in place for enabling interdisciplinarity to become a leading organizing principle for how UW teaches, studies, and does research. A goal is that interdisciplinarity as a research and scholarship approach will inform priorities in hiring, the pursuit of grant dollars, and the integration into UW's brand and external messaging. UW intends for interdisciplinarity to become a draw for the nation's best students, leading to their engagement in interdisciplinarity pursuits. Additionally, interdisciplinarity will become a compelling recruitment tool for employers looking for young talent with demonstrated skills in engaging in rich, complex problems of great societal impact. More generally, a goal is that interdisciplinary research and scholarship develop in students a flexibility in thinking, an inventiveness, and will bring forward in them an understanding that they can successfully engage in a complex, disruptive world.

b. Organization and process used in this assessment

Members and participants, and home organizations

Johannes Addido, School of Teacher Education
James Ahern, Graduate Education (Working Group Leader)
Gabrielle Allen, Research & Economic Development (Facilitator)
Anas Alrejfal, Civil & Architectural Engineering
Tasnim Ara, Chemistry
Susan Aronstein, English
David Bagley, Engineering & Applied Science
Karyn Berchini (Assistant to the VP for Research and Economic Development)
Karen Bartsch Estes, Psychology
Katie Christensen, University Art Museum
Jeannie Czech, Criminal Justice & Sociology
Paul Flesher, American Heritage Center
Jeffrey Hamerlinck, Wyoming Geographic Information Science Center (Working Group Leader)
April Heaney, LeaRN Programs
Isa Helfgott, Global Engagement (Working Group Leader)
Scott Henkel, English and African American and Diaspora Studies (co-chair)
John Koprowski, Haub School of Environment & Natural Resources
RoseMarie London, Office of the President
Toby Marlatt, Foundation
Ryan O'Neil, VP Student Affairs Office
Peter Parolin, Honors College
Scott Quillinan, School of Energy Resources
Rian, Residence Life & Dining Services
Barbara Rasco, Agriculture & Natural Resources
Sandy Root-Elledge, Wyoming Institute for Disabilities (WIND)
Janel Seeley, Ellbogen Center for Teaching & Learning
Jason Shogren, Economics
Saber Smith, ASUW
Hunter Swilling, ASUW
Edmund Synakowski, Research & Economic Development (co-chair)
Jennifer Tabler, Criminal Justice & Sociology
Eric Webb, Residence Life & Dining Services
Jing Zhou, Chemistry

Process

The group first met as an ensemble in early February. Two standing meeting times, each of two-hour duration, were set aside to enable much of the work to be done. After several meetings of the 20 or so participants, the group was divided into three working groups, each with their own topical foci. Some of the interests of each group overlapped, and so when the groups reconvened, many common threads emerged. These threads were identified and sorted by the group leaders, facilitator, and chair, and distilled into high-level recommendations. This set of recommendations was discussed with the full group. The recommendations represent a strong consensus of the group regarding priority near- and long-term action items to help capture opportunities as well as address standing challenges and obstacles.

c. Findings and Observations

There was strong consensus regarding the high value of interdisciplinary research, scholarship, education, and engagement, and developing approaches to stimulate each. In the pillar discussions, expressions of reasons for these pursuits were ample and included the following:

- Societal challenges that are felt most urgently are those that impact quality of life. They often have substantial elements requiring attention from STEM fields and economics, and social elements requiring attention from the humanities and arts. Thus, to be addressed completely, many societal challenges are optimally addressed with a combination of interdisciplinary perspectives with approaches that integrate different ways of thinking, question-posing, and problem-solving. Interdisciplinary approaches enable us to think about the ways in which we move through the world from a diversity of perspectives. For this reason, using such approaches is intrinsically valuable and is in the best spirit of the land grant university mission. Interdisciplinarity is about various ways of interpreting data and interacting with multiple kinds of information. Interdisciplinarity encourages synthesis, helps us to ask better questions, enables better problem-solving, and makes our work more than the sum of its parts. As a pathway to creativity, interdisciplinarity fosters innovation, the interaction of diverse perspectives, and facilitates the creation of new knowledge. As a result, multiple ways of grappling with new knowledge take a variety of forms: academic scholarship, new models for public engagement, new scientific technologies, and new artistic and creative productions.
- Interdisciplinarity as a pillar to UW research and education is important to the state of Wyoming because Wyoming's challenges are complex and can only be successfully addressed in their entirety by consideration from and exchange between experts from myriad domains.

- Interdisciplinary perspectives have potential for integrating at their foundation attention to inclusion, equity, and diversity issues.
(e.g. <https://www.theguardian.com/lifeandstyle/2019/feb/23/truth-world-built-for-men-car-crashes>). Thus, this pillar's interests are intimately tied to those of the Inclusivity Pillar.
- Interdisciplinary teams are important for UW to develop competitive large-scale grant proposals as funding agencies increasingly become focused on complex societal challenges.
- Disciplinary excellence is a necessary element of interdisciplinary excellence. Interdisciplinary approaches can support and draw out the best of our existing disciplines and amplify the value of disciplinary knowledge and achievement. They also depend on having a diversity of disciplines and excellence in those disciplines.
- In order to attract students to UW and best prepare them for the complex needs of today's employment marketplace, we need to train students for new interdisciplinary fields and educate them in how to integrative diverse methods for research and analysis. Interdisciplinarity being embedded in curricula and exposure of undergraduates and graduate students in this domain is also attractive to prospective employers. The proposed School of Computing and the Center for Entrepreneurship and Innovation will be critical new elements that will demand explicit attention to working in an interdisciplinary fashion, and will catalyze interdisciplinary work and innovation as well.
- Interdisciplinarity promotes diverse ways of solving problems and thinking (e.g., using arts and humanities not to illustrate but to see and work toward different solutions), important for continued faculty development and vitality of the campus.
- New ways of engaging and expanding the research enterprise will contribute to recruiting and retaining both faculty *and* students.
- Interdisciplinary excellence can be a compelling draw to donors, corporate partners, and foundations. The societal impact of the problems that interdisciplinary scholarship can address runs deep and often is deeply related to the interests of these entities.
- Interdisciplinary excellence can be attractive to government sponsors whose mission it is to serve society in the complex domains that demand such approaches. With a strong reputation in this arena, UW can come to be known as a "go-to" resource for agencies serving the interests of the state and the nation.
- Interdisciplinary scholarship enables many facets of UW to speak to the interests of Wyoming and the nation from the same script while at the same time from different domains. This helps communicate that UW's breadth of scholarship is purposeful and

relevant. Interdisciplinarity scholarship, research, and education has the potential of being uniquely grounded in Wyoming's extraordinary attributes, enabling UW to distinguish itself from the many peers who are also increasing their engagement in this class of activity.

d. Summary of Recommendations

The pillar group discussion yielded a strong consensus around the following elements. The recommendations are divided into four categories: New Enabling Structures; Enabling Practices and Policies; Interdisciplinary Education and the Student Experience; and Engagement. Summaries of each are provided in this section, with near-term action items identified. In Section II, a fuller description of the recommendation and a fuller range of considerations is given. Also given for each recommendation is a high-level descriptor of the budgetary needs and implications. More detail on these items is given in Section II.

New Enabling Structures

- **Form an Interdisciplinary Incubator, to be administered at the highest levels of the university**

The incubator will support the catalyzation and early-stage development of interdisciplinary research teams and interdisciplinary teaching initiatives. The incubator will navigate between both grassroots and strategic opportunities and priorities, and as such should have support at the level equivalent to an associate vice president for research, reporting jointly to the vice president for research and economic development and the provost.

The incubator will provide a critical role in forming and nurturing interdisciplinary teams around the Grand Challenges and other opportunities using a variety of support mechanisms including seed funding, seminars, network analysis, private funding facilitated by the UW Foundation, state agencies and federal/private foundations, and marketing and communication on interdisciplinary research. The incubator will work to encourage the establishment of new interdisciplinary teaching and learning opportunities, and the integration of research and teaching.

- **Create institutional home(s) for the Grand Challenges that cut across departmental and college lines**

By their nature, Grand Challenges are large, thorny, interdisciplinary problems of social, cultural, economic, political, and scientific concern. They are too complicated to be

managed through existing administrative structures, e.g., a single department or even a single college. The Interdisciplinary Pillar Team recommends that to accomplish the immense promise of Grand Challenge efforts, the initiative should be housed in ORED, perhaps also shared with Academic Affairs, and each research project that the Grand Challenge initiative incubates should be housed under the auspices of specifically identified, interdisciplinary organizations at UW. For challenges where such an appropriate structure does not already exist, the Vice President for Research and Economic Development and Provost shall convene a group tasked for developing a framework for such a structure. Grand Challenges projects will be led by a UW faculty member as a PI, whose home department will receive buy-outs. Each research project must formulate a plan for financial stability that includes UW support, grants from state, federal, or international sources, and private philanthropy.

- **Establish a School of Graduate Studies**

A new School of Graduate Studies shall identify and nurture research, teaching, and engagement across all disciplines and build components of high priority UW enterprises. As the only school or college that oversees students from all colleges and most academic units, the School of Graduate Studies would be uniquely positioned to support and promote interdisciplinary efforts. Interdisciplinarity will be at the heart of the school's mission.

The School of Graduate Studies will:

- Facilitate graduate students' introduction to interdisciplinary scholarship through professional development and collaborative social events.
- Integrate graduate students into supporting the First Year Experience.
- Foster connections among graduate students and graduate faculty to promote current and new interdisciplinary scholarship.
- Promote new graduate programs, including PhD and MA programs in the humanities and social sciences.
- Promote interdisciplinary minors and certificates to provide disciplinary graduate students with opportunities for interdisciplinary training.
- Serve as the administrative home for cross-college interdisciplinary graduate degree programs (an evolution of the current Office of Transdisciplinary Graduate Studies)
- Foster and facilitate graduate student involvement in interdisciplinary engagement and outreach efforts.

- Harness graduate assistant allocations to support strategic priorities, including the Grand Challenges.

- **Blue Sky: Create a Wyoming Institute for Advanced Study**

Urged is that a plan be developed for a Wyoming Institute of Advanced Study (WY-IAS), primarily funded by significant donor funding, that would provide a haven to bring together outstanding researchers and thought leaders in a venue free from constraints of disciplinary boundaries, administrative burdens, and formal teacher duties, allowing for true interdisciplinary scholarship and innovation to flourish. We envisage residential fellows drawn from both UW and around the world, who are selected on the basis of their scholarly achievements and potential contributions, without regard to discipline. The WY-IAS could promote high-level grand challenge themes of interest as a backdrop to any research or scholarly area.

While there are IAS's on the east and west coast there is none in the middle of the country, leaving Wyoming researchers and citizens disconnected from the benefits of such an institution. At the same time, Wyoming is an attractor for many people with its beautiful scenery, amazing wildlife, and rich cultural history. We believe that the WY-IAS would provide a world-famous academic think tank and innovation engine that would impact economic development, and would be a visible focal point for interdisciplinary science and outreach for the University that would serve to advance all the aims of the Interdisciplinary Pillar.

Enabling Practices and Policies

- **Create and strengthen open research and scholarship culture and infrastructure**

- The digital, connected age has irretrievably altered how research and scholarship are conducted, and what it means to be part of a research and scholarship community. An institutional effort to catch a national and global wave in open research and scholarship will yield great benefits in facilitating a culture of data sharing and discourse, essential if UW is to lead in bringing previously siloed and separated units together in confronting problems that demand attention from across the disciplines

- **Ensure that the ongoing policy for creating, evaluating, and sunseting institutes and centers is well suited for the emergent opportunities regarding interdisciplinary institutes and centers**

- These policies and procedures will enable the interdisciplinary role of centers and institutes at both the ‘macro’ level (e.g., directly under the Office of Academic Affairs or Office of Research and Development) and the ‘local’ level within colleges and departments.
- **Augment or redesign the RTP process and annual performance review at all levels of our organization to not only notice interdisciplinary activity performed by a faculty member, but also to reward and incentivize it**
 - The change could be integrated with other values that UW wishes to foster in its faculty, such as internationalization, team teaching, and community engagement, providing faculty with RTP recognition but allowing faculty to pursue their interests, skills and opportunities without penalty.
- **Remove structural impediments and disincentives to collaboration in interdisciplinary teaching across campus**
 - This will be enabled by:
 1. Developing mechanisms to pay home departments to offset the cost of instructors participating in interdisciplinary courses.
 2. Empowering efforts to develop timely and necessary interdisciplinary curricula.

Interdisciplinary Education and the Student Experience

- **First Year Experience: launch new curricula and Living-Learning Communities for first year students that are centered on interdisciplinary challenges**
 - Recognizing that many students may not feel prepared to focus attention on a single interdisciplinary challenge, launch LLC’s that focus on interdisciplinarity itself, exposing the student to broad classes of interdisciplinary problems.
 - Promote undergraduate research experiences as platforms that can be woven into the LLC experience, and provide communities for students in and beyond the freshman year.
- **USP Gen Ed and Curricula: encourage and support the work of the Next Gen USP committee so that the curriculum is truly university-wide and is rooted in interdisciplinarity**

- Augment or design curriculum for first year studies that builds upon existing interdisciplinary work and expands interdisciplinary offerings.
- Design a truly university-wide curriculum for undergraduate progression that weaves interdisciplinary and disciplinary approaches.
- Foster USP curriculum that facilitates better time to graduation, student retention, and ultimately increases graduation rates.
- Promote interdisciplinary principles through capstone and internship experiences.
- Support instructors as they design, implement, and assess interdisciplinary teaching practices.

Engagement

- **Foster interdisciplinary knowledge co-production, economic development, and workforce readiness through engagement activities across the State of Wyoming and the Mountain West region, as well as nationally and internationally**
 - *Engagement and Communication* is a core land grant university value. This involves engagement with local, state, tribal, national and global constituencies and inspires our daily work. The university is committed to active outreach and clear communication with our extensive communities and to impacting those communities. Metrics for meeting this goal of impacting communities will involve improving and enhancing the health and well-being of our communities and environments through outreach programs and in collaboration with our constituents and partners. Specific goals include facilitating collaboration between the university and its constituents to address complex economic, environmental and social challenges through research, education, entrepreneurship, economic diversification and growth, supporting campus wide engagement, enhancing economic development across the state through partnerships and enhancing Extension programming.
 - Many examples of successful engagement already exist at UW, from a long history of support for 4-H youth development across the state and Ruckelshaus Institute collaborative discussion with communities to the Saturday University program bringing top UW professors to engage and share new knowledge with Wyoming communities and the Ann Simpson Art Mobile sharing museum-quality artwork with places that may otherwise have limited access to original art.
 - This work should include continued support for the **initiatives and** programs originally promoted by the Office of Outreach and Engagement (e.g., possible pursuit of the Carnegie Engagement University designation), as well as investment in new strategic directions for UW Extension. Additionally, in alignment

with the goals of the Entrepreneurship Pillar, interdisciplinary principles should be advanced through participation and leadership in the emerging Wyoming Innovation Network, a partnership with the state's seven community colleges.

- The emergent Wyoming Innovation Network (WIN) is born from the recognition that UW and the community colleges must become more interdisciplinary and systems-oriented. To realize this goal, the WIN will pursue a systems approach that leverages partnerships and cross-fertilizes to provide better mechanisms for faculty to collaborate on solutions to Wyoming challenges, and to enrich the educational offerings for its students. With input from the Wyoming Business Council and the Wyoming Business Alliance, these educational activities will be directly coupled to new corporate partner networks and innovation training centers, to provide opportunities for students and faculty alike to support the growth of economic advancement throughout the state. In doing so, the WIN will enrich the student experience at all its member institutions through development of collaborative courses and other programs.

Summary of Financial Implications and Approaches

Details vary by recommendation, but overarching themes have emerged. More details are provided for each recommendation in Section II:

- Much can be initiated with little additional investment. Administrative support will be needed in the near term to support formation of an Interdisciplinary Incubator, and for initial support of the Grand Challenges, especially in areas where existing UW organizations will not provide a suitable home. No near-term additional investment will be needed for the proposed Graduate School. Administrative support will be required to support strengthened engagement activities.
- A requirement for Grand Challenges is to develop business models that enable self-sustaining operations, either through grant capture, corporate engagement, or donor support. Given the societal importance of the Grand Challenges, the prospect of cultivating donor support should be significant. Given that Grand Challenges initiatives should demonstrate Wyoming impact, the prospect of corporate engagement needs to be pursued for these as well.
- The “Blue Sky” initiative of creating a Wyoming Institute for Advanced Study has a unique resource requirement among all those here, requiring substantial resources, perhaps in the form of endowments and/or corporate commitments, to attract internationally known scholars and researchers to Wyoming.

II. Recommendation details, background, considerations, and actions

Details, background, considerations, and actions regarding each recommendation are given below.

New Enabling Structures

II.1 Form an Interdisciplinary Incubator, to be administered at the highest levels of the university

The challenges and opportunity facing human society and thus scientific research increasingly require solutions that draw upon expertise in multiple disciplines. From pure research to community-engaged applied investigations, the most useful outcomes stem from cross-disciplinary projects that combine the insights, research methods, and modes of thinking from two or more disciplines. And of course, if the future of research is interdisciplinary, then our teaching mission requires us to teach our students how to think in these same ways.

To address such 21st century challenges, the University of Wyoming seeks to increase the amount of interdisciplinary research and teaching that its faculty undertake. Although many UW faculty already perform interdisciplinary research and teaching, nearly all have had to struggle against hurdles that make such activity difficult. This paper proposes an interdisciplinary incubator so that UW can develop a reliable means to support the formation of interdisciplinary projects that encourages cross-fertilizing ideas, supports interdisciplinary team formation, and nurtures teams to success and independence.

In a nutshell, the concept of the incubator is to have an office at the highest level of the university that promotes the grassroots formation of interdisciplinary activities, nurturing cross-disciplinary fertilization, multi-disciplinary team formation, interdisciplinary research and teaching projects. The incubator would take steps to bring interdisciplinary groups into existence, help them organize and locate resources, and support their maturation into independent projects. The incubator will leverage, support, and liaise with other existing and emerging units that support, use and promote different aspects of the interdisciplinary ecosystem. For example, the proposed Center for Entrepreneurship and Innovation (see Entrepreneurship Pillar), School of Computing (see Digital Pillar), School of Graduate Studies, Living-Learning Communities, and the Grand Challenges all provide vehicles to help drive interdisciplinary activities, and in return the interdisciplinary incubator will help them in achieving their own missions.

Goals of an Interdisciplinary Incubator

The incubator would support the formation of two categories of interdisciplinary research, helping them move from nascent beginnings to mature independence.

- Grass-roots, bottom-up formation of interdisciplinary research teams focusing on research/teaching projects of their own devising.
- The development of interdisciplinary teams to address grand challenges and/or engage with community needs, whether local or statewide, engaging with the Wyoming Innovation Network to support the development of interdisciplinary projects across the state in partnership with the community colleges.

Ultimately these strategies will nurture a culture of interdisciplinarity in addition to significantly increasing the capacity of UW to pursue large team projects built upon a critical mass of experienced interdisciplinary team leaders.

Stages of Interdisciplinary Formation

The incubator will undertake activities to encourage creative, interdisciplinary thinking at a variety of levels, from initial brainstorming to nurturing nascent teams to “graduating” independent research projects. To encourage interdisciplinary team formation, the incubator will provide resource opportunities for interdisciplinary activities undertaken by individuals and pairs as well as larger groups of faculty members at all stages of formation. These stages include:

- Learning about possible cross-disciplinary cooperation through invited interdisciplinary speakers who are leaders of successful interdisciplinary projects on a variety of topics and issues from both UW and outside.
- Assisting individual researchers to identify people in other disciplines to work with. Identifying skills, knowledge and topics in other disciplines that could help one solve the problem/question upon which one is working.
- Helping to form cross-disciplinary faculty groups with a shared general purpose and then aiding in the refinement of that purpose to specific research or teaching goals.
- Providing support to interdisciplinary groups as they devise long-term strategies to pursue research or teaching goals. Such support could range from meeting space to consultation opportunities to small seed grants.
- Implementing the strategies through activities such as writing grant applications, undertaking pilot projects, composing exploratory papers, and so on.
- Transitioning mature projects to new homes outside the incubator to sustain their function, enhance their impact, and increase UW capacity and experience with large team projects.
- Coordinate and collaborate with the research office and the UW Foundation to find opportunities with industry partners, private foundations, government agencies, and

nongovernmental organizations. A multidisciplinary approach ensures diverse expertise and perspectives—and possibly funding as well. A critical element is to correctly align a project with the funder’s scope, whether it is a foundation, industry, or individual donor.

Incubator Organization

The interdisciplinary incubator would be located at UW’s highest levels and should be supported jointly by the Office of the VP Research and the Office of the Provost. This will both signal the value that the university places on interdisciplinarity and enable it to be equally available to all college and non-college teaching and research entities.

The incubator will consist of staff, space and monies with which to invest in and nurture interdisciplinary activities and teams. The incubator will be led by a full-time faculty director (with the rank of associate vice president) assisted by two part-time faculty facilitators, an office administrator and access to a business office management. It will have a location for offices, space for collaborative team discussions, and an area that will provide space for lectures and seminars. The Interdisciplinary Incubator would cooperate with other UW centers and units—such as but not limited to the Global Engagement Office, the (new) School of Graduate Studies, the Ellbogen Center for Teaching and Learning, the Wyoming Institute for Humanities Research—seeking to have them help support key interdisciplinary activities.

Near-term actions (6-12 months)

1. The Provost and VPRED establish and charge a search committee to initiate a search for the inaugural Director of the Interdisciplinary Incubator
2. The director will produce an organizational and business plan for the incubator, as well as an evaluation plan
3. Establish the Interdisciplinary Incubator at UW.
4. Support the strengthening of the Research Services division within the Office of Research and Economic Development to promote catalyzing, identifying, nurturing, and responding to funding opportunities, including the writing of strong proposals to agencies, foundations, and donors. These activities will have near-, mid-, and long-range horizons
5. Enhance institutional capacity for team building to pursue “megagrants.”

Budgetary prospects and implications

1. Require initial investment for leadership position and administrative support. Consider buy-out of a faculty member with strong administrative experience and a proven background in research and scholarship in complex organizations.
2. Direct portion of indirect cost recovery from grants captured for future sustainability and providing resources for seed grants to generate additional grant capture.
3. Part of the incubation process should be development of business models aimed at establishing self-sufficiency, to be developed with Office of Research and Economic Development and Foundation participation and other university resources including, as appropriate, the College of Business's Center for Business and Economic Analysis

New Enabling Structures

II.2 Create institutional home(s) for the Grand Challenges that cut across departmental and college lines

In January 2019, the University of Wyoming Office for Economic Development and Research and the Office of Academic Affairs teamed to announce the development of a new research initiative to focus on society's Grand Challenges. This announcement created a Research Planning Council (RPC) which would oversee the development of six to eight transdisciplinary Grand Challenge research areas. The RPC was composed of faculty and researchers from across campus and led by four co-chairs: Danny Dale, Isadora Helfgott, Scott Henkel, and John Kaszuba. After numerous listening sessions across campus and the state, the RPC summarized its results and by October 2020, it identified five central themes to be pursued:

1. Biodiversity and Earth Systems Change
2. Energy Transition and Economic Diversification
3. Public Trust in Research and Information
4. Rural Health Issues
5. Quality of Democracy and Equality

The Grand Challenge initiative continues, with the RPC co-chairs releasing a Request for Proposals for Planning Grants in early 2021 with the goal of having these planning grants assist multidisciplinary teams of researchers to build new areas of distinction and to develop further capacities for current projects. The preferred proposals would show high promise for attracting

external funding, for serving as the basis for broad, impactful partnership, and for rising to the moment in addressing Wyoming's urgent societal and economic needs. Eleven interdisciplinary teams submitted proposals that are currently undergoing review.

Although originally conceived as areas for interdisciplinary research activities, the Grand Challenges go beyond research and will directly overlay with academic initiatives such as the Wyoming Innovation Network (WIN). Based on the same fundamental pillars as UW's strategic planning effort, WIN will use interdisciplinary approaches aligned with the state's economic diversification interests to achieve success. WIN specifically engages UW and the Wyoming Community Colleges to develop new educational programming to serve the state's workforce but WIN also will support entrepreneurs and new business starts; a proactive research agenda aimed at tech transfer and commercialization and developing robust corporate partnerships (for funding, apprenticeships, internships, etc.). There is thus a natural link between the Grand Challenges initiative and WIN.

A key step now is to develop a framework to sustainably support interdisciplinary efforts to address the Grand Challenges. By their nature, the Grand Challenges are large, thorny, interdisciplinary problems of social, cultural, economic, political, and scientific concern. Distinct research projects are simply too complicated to be managed through existing administrative structures, e.g., a single department or even a single college. Furthermore, the RPC, which has worked admirably to develop the Grand Challenges, can provide some, but not all, support for the teams addressing Grand Challenges. The teams will conduct research across multiple disciplines, develop educational strategies in several programs, and conduct extensive engagement with a wide variety of stakeholders throughout Wyoming.

The Interdisciplinary Pillar Team recommends that to accomplish the immense promise of Grand Challenge efforts, the institutional home for the Grand Challenges initiative should be at a high level, and reflect its application to research, teaching, and public engagement. We would recommend that the initiative remain a joint venture between ORED and Academic Affairs, as was originally proposed, perhaps under the direction of an associate vice president who reports to both organizations.

Each distinct research project that the Grand Challenge initiative incubates should be housed under the auspices of specifically identified, interdisciplinary organizations at UW. Current interdisciplinary organizations at UW that may be natural homes for Grand Challenge projects are the Haub School of Environment and Natural Resources (a possible home for the challenge: Biodiversity and Earth Systems Change) and the School of Energy Resources (a possible home for the challenge: Energy Transition and Economic Diversification). These existing organizations also have developed academic programs that could benefit from housing a Grand Challenge project. Other organizations likely already exist at UW for housing some Grand Challenge projects, and new organizations that are being examined for creation, such as the Center for Entrepreneurship and Innovation and the School of Computing, should also be

considered as possible homes for Grand Challenge and other interdisciplinary projects. Finally, it will be reasonable to expect, based in part on the results of the group working to define the creation of centers and institutes at UW, that Grand Challenges projects will result in new units that are appropriate to the content of their projects, i.e., new centers for projects of a moderate scale or new institutes for projects of a considerable scale. A requirement of the recent planning grant RFP process was that faculty teams be composed of researchers in a diversity of units; therefore the institutional home for the different projects will vary.

The Grand Challenge initiative also has the potential to guide future hiring of faculty, with a specific focus on (a) senior and mid-career faculty with a track record of successful interdisciplinary project funding and completion in the Grand Challenge area of interest, and (b) junior faculty who show high potential for interdisciplinary projects in the Grand Challenges. The specific requirements for faculty will be determined as the Grand Challenge initiative proceeds.

Near-term actions (6-12 months)

1. Work with the task force on centers and institutes to create appropriate guidelines for launching new organizational forms for research, teaching, and engagement projects.
2. Based in part on the results of the currently ongoing planning grant process, identify the suitable organizational form to house each Grand Challenge, e.g., as a program, a center or institute or even a school. Where an existing, mature structure exists that is appropriate for administering a given Grand Challenge, housing the new Grand Challenge projects under existing interdisciplinary organizations provides the advantage of existing infrastructure for conducting interdisciplinary work. Where possible, create the Grand Challenge centers and support the work of currently existing units that will take on new Grand Challenges-funded projects. Where such a home does not exist, the Vice President for Research and Economic Development and Provost should work with deans to develop the framework for a new structure appropriate for nurturing that Grand Challenge.
3. The Grand Challenges RPC will design a mentoring and cohort experience for the teams that won planning grants, to draw from the experience of each team in order to support all teams.
4. In fall 2021, the research teams that won planning grants will present the results of their work up to that point in a symposium open to the public.

Mid-term actions (12-24 months)

1. Given the results of the planning grant competition, successful PIs and research teams will draft plans to implement their projects. This will include but is not limited to developing mechanisms to recruit faculty members to the project, identifying ideas for external proposal development, developing relationships with key stakeholders in Wyoming who may serve as external advisors and participants, developing a business

plan to sustainably support the center, and developing metrics to be used to review center performance and success.

2. Research teams can recruit faculty members, assuring an interdisciplinary focus, to the projects. They may also identify the potential for new faculty to join UW.
3. Research teams should begin preparing and submitting proposals for external grants and private philanthropy. Grand Challenge projects must become financially sustainable in a short period of time. Research teams should coordinate with WIN as well to identify potential funding sources and partners in the state.
4. Prepare an annual report that summarizes progress against plans and provides a path to achieve economic sustainability.

Long-term actions (after 24 months)

Each Grand Challenges project should actively develop research, teaching, and engagement. Each Grand Challenges project will be led by a UW faculty member as a PI, with the PI's home department receiving buyouts. Each research project must formulate a plan for financial stability that includes grants from state, federal, or international sources, robust corporate support from within and outside Wyoming, and private philanthropy. UW resources will augment administrative and infrastructure support. Periodic reviews should be conducted, consistent with the developing policy for centers and institutes, to identify potential course corrections and also whether the center has achieved its goal and should be sunset.

Budgetary prospects and implications

1. Administrative support required, to be provided by ORED and Academic Affairs.
2. We recommend that a portion of the "Provost Tax" provide support for the Grand Challenges planning grants, seed grants, and infrastructure grants, in concert with the business model described below.
3. While initial investment to stand up the Grand Challenges will be needed, a requirement will be that a GC center or institute be accompanied by a business model that has high promise for grant capture, donor contribution, and/or corporate partnership that will yield self-sufficiency. Progress towards self-sufficiency should be measured regularly, with weak performance a significant consideration in determining the viability of continuing a given GC effort. The Biodiversity Institute is working toward demonstrating the viability of such a model, in concert with the UW Foundation, to provide lessons for such a transition.

II.3 Establish a School of Graduate Studies

A new School of Graduate Studies shall identify and nurture research, teaching, and engagement across all disciplines and build components of high priority UW enterprises. As the only school or college that oversees students from all colleges and most academic units, the School of Graduate Studies would be uniquely positioned to support and promote interdisciplinary efforts. Interdisciplinarity will be at the heart of the School's mission.

Graduate studies are often a bastion of interdisciplinary work on any campus, including UW. The creation of a School of Graduate Studies would build upon UW's recent efforts to recentralize and better support graduate education at the university and promote interdisciplinarity. Currently, the administration of graduate education falls under the Office of Graduate Education, which was established in 2018. A strong central administration and support of graduate education, including the creation of a graduate school, appointment of a graduate dean and creation of graduate faculty, was one of the findings of the 2018 Council of Graduate Schools Strategic Review.

In addition to addressing the Council of Graduate School's recommendations, the establishment of a School of Graduate Studies would create the only college or school that oversees students and programs from all colleges and most academic units. This would make it uniquely positioned to support and promote interdisciplinary efforts, and interdisciplinarity should be at the heart of the school's mission. Through professional development opportunities and social events, including lecture and discussion series, the School of Graduate Studies would foster graduate students' engagement with interdisciplinary scholarship, teaching and outreach. Furthermore, complementing and coordinating with the Interdisciplinary Incubator, the School of Graduate Studies would grow connections among graduate students and graduate faculty to promote ongoing and generate new interdisciplinary scholarship.

The School of Graduate Studies will promote and implement new graduate programs, including PhD and MA programs in the humanities and social sciences. The creative, critical, and analytical knowledge such programs produce is inherently interdisciplinary, and also speaks directly to becoming more inclusive and digital. These new graduate programs in the humanities will prepare the next generation of researchers and teachers for a world that is growing more interconnected, diverse, and dynamic. These new programs will have both a strong disciplinary and interdisciplinary character, and can be housed in existing units or shared by units, given their content. In particular, establishing new PhD programs in the humanities is a key, and required, component for attaining a higher Carnegie status for the University of Wyoming, and would play a vital role in the pursuit of Carnegie Engaged Institution status.

With interdisciplinarity at its core mission, the School of Graduate Studies would also promote and implement interdisciplinary graduate minors and certificate programs to offer interdisciplinary training to disciplinary graduate students. This would both promote interdisciplinary research and, crucially, prepare UW graduate students for complex, interdisciplinary challenges. As an evolution of the current Office of Graduate Education's Office of Transdisciplinary Graduate Programs, the School of Graduate Studies would serve as the administrative home and provide staffing for cross-college graduate interdisciplinary degree programs.

The School of Graduate Studies would use policy and resources to promote interdisciplinarity. Policy could be updated so that graduate students, at least in many disciplines, would have interdisciplinary training as integral parts to their programs. With the School of Graduate Studies, graduate faculty policy and procedure would be used to foster interdisciplinarity by opening the door to more graduate mentorship by and collaboration with personnel from outside the student's discipline. Regarding resources, the School of Graduate Studies would harness its graduate assistantship allocations to support strategic priorities including interdisciplinarity and the Grand Challenges.

Near-term actions (6-12 months)

1. Create the School of Graduate Studies as a new organization at UW. The school will be led by a dean who reports directly to the Office of Academic Affairs and serves on the Provost's executive team (an associate vice provost or similar). This arrangement was recommended by the 2018 [Council of Graduate Schools Strategic Consultation Review of the University of Wyoming](#).
2. Task the dean to develop a business model for the school in partnership with the Division of Finance and Administration, and through consultation with the Council of Graduate Schools and public institutions of comparable size with graduate schools.
3. Form a search committee to oversee the search for a new dean of the School of Graduate Studies.

Budgetary prospects and implications

1. No additional resources beyond those currently devoted to the Office of Graduate Education would be required to stand up a School of Graduate Studies. Expansion beyond the Office of Graduate Education's current mission may require additional administrative support in the long run.

2. Graduate programs in the humanities are generally revenue-generating, given the best models for GTA teaching in relation to undergraduate tuition receipts and the low cost of materials.

3. A business model for the School of Graduate Studies should leverage opportunities for revenue generation to help fund the school, including utilizing tuition revenue shares from revenue-generating programs.

New Enabling Structures

II.4 Blue Sky: Establish a Wyoming Institute for Advanced Study

Wyoming Institute for Advanced Study. This recommendation of the Interdisciplinary Pillar team is an aspirational and ambitious goal (which we believe is audacious enough that with a visionary president supporting it, it could actually be successful). We suggest that a plan be developed for a Wyoming Institute of Advanced Study (WY-IAS), primarily funded by significant donor funding, that would provide a haven to bring together outstanding researchers and thought leaders in a venue free from constraints of disciplinary boundaries, administrative burdens, and formal teacher duties, allowing for true interdisciplinary scholarship and innovation to flourish.

We take our inspiration from reviewing independent Institutes for Advanced Study (http://www.swedishcollegium.se/subfolders/International_Links/SIAS.html), and University-Based Institutes of Advanced Study (e.g. <http://www.ubias.net>). We propose that the WY-IAS be envisaged as a University of Wyoming unit, able to leverage support mechanisms (e.g. our library, American Heritage Center, etc) and contribute to the UW mission. As with other IAS's we envisage residential fellows drawn from both UW and around the world, who are selected on the basis of their scholarly achievements and potential contributions, without regard to discipline, etc. While individual researchers should be drawn from all disciplines, it could be possible that the WY-IAS promotes high level grand challenge themes of interest as a backdrop to any research or scholarly area.

Why is this a good fit for Wyoming? While there are IAS's on the east and west coast there is none in the middle of the country, leaving Wyoming researchers and citizens disconnected from the benefits of such an institution. At the same time, Wyoming is an attractor for many people with its beautiful scenery, amazing wildlife, and rich cultural history. We believe that the WY-IAS would provide a world-famous academic think tank and innovation engine that would impact economic development, it would be a visible focal point for interdisciplinary science and outreach for the University that would serve to advance all the aims of the Interdisciplinary pillar, and it would provide a mechanism to connect the university more deeply to the large

number of tourists who travel through Wyoming. While education is traditionally not a prime target for IASs, its programs would directly improve our educational offerings, and we envisage for example there being fellowships for PhD scholars to join the community.

While we think this is an audacious recommendation, we do not believe it is unreachable. The financial statements of the National Humanities Center (https://report2019-20.nationalhumanitiescenter.org/wp-content/uploads/NHC_FinancialStatements_2019-20.pdf) indicate that an endowment of \$100M would be the level of donor funding needed to sustain the Institute, and we note that Wyoming has the largest number of billionaires per capita in the nation. The university is already expanding its presence in the Jackson area which would be a prime location for the institute. We have resources such as the AMK ranch and the Jentel Foundation to leverage. Wyoming is also home for many accomplished professionals, a number more of whom are moving to Wyoming from the East and West Coasts following the pandemic, whose support could also be targeted towards establishing and supporting the WY-IAS and its operation.

Near-term action (6-12 months)

Convene a group to survey the practices and visions associated with other institutions with similarly ambitions but perhaps differing visions, including Jentel, which is already in Wyoming, as well as the IAS at Princeton and the Center for Advanced Study at the University of Illinois. Develop an idea paper, to bring to maturity in one year's time, for a WY-IAS that includes consideration of scope and fundability.

Enabling Practices and Policies

II.5 Create and strengthen open research and scholarship culture and infrastructure

Our digital, connected age has irreversibly altered how research and scholarship are conducted, and what it means to be part of a research and scholarship community. An extended, committed institutional effort to catch a national and global wave in open research and scholarship will yield great benefits in facilitating a culture of data sharing and discourse, essential of UW is to lead in bringing previously siloed and separated units together in confronting problems that demand attention from across the disciplines.

Forces acting on institutions in this domain include researchers and scholars acting independently to create fora for information and data exchange on the web and the resultant emergence of online communities in different disciplines, federal agency policy changes regarding data management, and much more. The underlying driver is individuals acting on the

power of rapid exchange of information, including vast amounts of data, and the benefits they experience accruing from participating in these practices.

The influence on the research enterprise has been profound, prompting in-depth examinations by some agencies, publishers, and research institutions of how to best manage and assess research and scholarship. Indeed, Katz *et al.* (Katz DS, Allen G, Barba LA *et al.* **The principles of tomorrow's university [version 1; referees: 2 approved]** *F1000Research* 2018, 7:1926 (<https://doi.org/10.12688/f1000research.17425.1>) provided the consensus views of researchers, mostly early career, university leaders, funding agencies, and other stakeholders in a workshop funded by NIH and NSF aimed at envisioning the university of the future, considering the emergence of these changes, including how present-day universities can best evolve under the present condition. The authors escribed a set of 22 principles in six areas: credit and attribution, open scholarship communities, outreach and engagement, education, preservation and reproducibility, and technologies

The importance of UW being at the leading edge of this transformation is high in general, and with respect to enabling interdisciplinary approaches to research and scholarship to succeed. A small sampling of their conclusions reveals this relevance regarding the goal of enabling interdisciplinary research to succeed. For example:

“...Institutions should provide appropriate career paths for staff working on open research and maintain the institutional infrastructure required for open research, including recognizing and valuing new, emergent forms of digital outcomes, such as software and data creation, curation and preservation, that are crucial to open research endeavors. These pathways may require rethinking existing classifications and assessments of tenure-track, non-tenure-track, and staff categories of university participants, and funder support for personnel in these categories.”

“...Community activities often serve to evaluate, encourage, and improve the use of tools, software, platforms, and data that are critical to open scholarship. All stakeholders must take steps to encourage these communities to develop, such as supporting common standards (and rewarding those who work on them), funding projects that form a “connective tissue” between different communities. They should also actively encourage sharing practices for tools, and people across communities.”

“...Universities and researchers share a mutual interest in interactions with diverse audiences. “

“...Every student should be guided to understand and learn how to access and use data and software to be well prepared for diverse, modern career paths.

“...Through open research training, universities should play an active role in increasing research by enabling evidence-based decisions, accelerating discovery, and extending impact to broader communities.

“...Universities should encourage their faculty to engage in open educational practices, including creating and assigning open educational resources, and reflecting open culture in their courses.”

“...The scholarly publication and communication ecosystem should support open and reproducible research and enable credit for these efforts. Universities should encourage these initiatives by creating incentives (e.g., promotion and tenure categories, service recognition) for such activities.”

“...Research funders should support open and reproducible research by making reproducibility part of their merit review criteria. They should also create new scholarly communication venues or support open scholarship efforts, and encourage, require, and reward reproducible research efforts.”

“...Incentives that promote the public sharing and distribution of scholarly knowledge for open/transparent/ reproducible research practices must be put in place. Publishers must require, when appropriate, submissions that provide open and reproducible workflows, and embed this requirement in their own workflows. “

“...Universities should recognize the activities of faculty to educate and train researchers on open and reproducible research skills. Global and national bodies (e.g., National Academies) should promote this recognition across universities.”

“...Open-source technologies, tools and platforms provide intrinsic value to researchers and educators and are an effective way of accelerating open scholarship. Academic institutions should favor and encourage open-source solutions as much as possible. “

“...A diverse and interoperable set of tools for open research should be known, shared, and clearly documented.”

The university must commit to promoting policies, practices, and technologies that promote open research and scholarship. Importantly, in developing these policies, practices, and infrastructure, *the involvement of junior faculty as well as staff will be critically important, as they are often the ones at the leading edge. Also, the junior faculty are the ones who will be most impacted by the actions taken in the near term.* The aims are intimately tied to the aims of the Digital Pillar, a School of Computing and ARCC. Success in all three will contribute substantially to success in transforming UW in the domain of interdisciplinarity. Moreover, as in other respects regarding interdisciplinarity, UW needs to examine and adjust its policies and practices regarding reward for tenure and promotion now that we are deep into the digital age of rapid information exchange.

Near-term actions (6-12 months)

1. Organize a follow-up to the “Principles of Tomorrow’s University” workshop described above, to be hosted at the University of Wyoming. This workshop can be used to revisit the experiences of the participants of the 2017 workshop, review, and update findings, and focus on the implementation of findings across institutions, including those in the Mountain West region. The workshop will also draw attention from federal agencies and others to the University of Wyoming as an engaged participant in interdisciplinary and open research.
2. Create an Open Research and Scholarship Committee (ORSC) with members from across the colleges as well as ARCC and Information Technology. The committee shall be tasked either by the president or by the provost and vice president for research and economic development with performing a review of best practices and generating recommendations regarding open research and scholarship. This committee should expect to be enduring until at least four major tasks are completed, and that follow-up reviews and continuing assessments follow, either with this committee or others spawned from this activity. This will be necessary given the profound nature of the changes that are to be encouraged. These tasks shall include the following:
 - a. A review and distillation of best practices for stimulating and rewarding an open research and scholarship culture, including from sources such as Katz *et al.* as well as from discussions with university research leaders at institutions regarded as leading in this domain. Recommendations shall be made to the provost regarding tenure and promotion practices considering the goals of UW becoming a leader in open research and scholarship.
 - b. A review and distillation of open research and scholarship practices already in place at UW, conducted by surveying research and scholarship leaders on campus. This shall include a summary of assets and obstacles as they experience them, and recommendations for removing obstacles and building on these practices.
 - c. Developing a set of recommendations for the role of existing assets and needs for additional assets, both hardware and human resources, considering the UW library, collections, a School of Computing, and ARCC, with a goal that the UW library be experienced on campus, statewide, and nationally as a leading research and scholarship tool in the open era.
 - d. Working with the UW Foundation, clarify the potential role of corporate partners in contributing to the development of open research and scholarship infrastructure that is in their interest and in the interest of the university.

- e. Recommendation of initial policy for inclusion of costs for open research and scholarship infrastructure, both hardware and human resources in state and federal grant proposals.

Mid-term (12-24 months)

1. Create a new position, to be supported by grant dollars realized as described above, with the responsibility of driving open research and scholarship infrastructure development. This person’s administrative home shall be in the UW Libraries or the School of Computing.
2. Further refinement of policy for inclusion of costs for open resource assets into grant proposals to state and federal agencies

Budgetary prospects and implications - none

Enabling Practices and Policies

II.6 Ensure that the ongoing policy for creating, evaluating, and sunseting institutes and centers is well suited for the emergent opportunities regarding interdisciplinary institutes and centers

The Provost’s Task Force on Centers and Institutes has been re-constituted after a two-year hiatus and is working to develop a new university regulation and/or standard administrative policy and procedure (SAPP) governing establishment, approval, management, review, and dissolution of centers and institutes across campus. Such guidance should lay the groundwork for future establishment of various “macro” and “local” centers and institutes and should factor in some assessment of interdisciplinarity principles in approving their creation.

Near-term actions

Task Force on Centers and Institutes proposed regulation and/or SAPP(s) for establishing C/Is are approved; subsequent committee work established range of organizational oversight models (President’s Office; Academic Affairs; Office of Research and Economic Development; colleges, schools and departments).

Mid-term actions

Update inventory of existing centers and institutes, including a preliminary assessment of legacy naming conventions, organization home, and degree of interdisciplinarity; create schedule for implementing a staggered five-year review process.

Long-term

Completion of campus wide review of existing centers and institutes.

Budgetary prospects and implications - none

Enabling Practices and Policies

II.7 Augment or redesign the RTP process and annual performance review to not only notice interdisciplinary activity performed by a faculty member, but also to reward and incentivize it—especially at the pre-tenure phase.

II.8 Remove structural impediments and disincentives to collaboration in interdisciplinary teaching across campus

Currently, interdisciplinary work at UW is too frequently undervalued, unrewarded, and even actively discouraged by cultural practices, such as those surrounding RTP (reappointment, tenure, and promotion), and the standard operations and expectations involved in curricula, course scheduling, and teaching workloads and tuition return. In order to achieve its strategic vision, UW must remove subtle boundaries around, structural barriers to, and add incentives for interdisciplinary research and teaching. Through such proactive actions, UW has the opportunity to grow the interdisciplinary activity needed to address major challenges.

Such changes are not easily made. They may strike some as involving a sacrifice of disciplinary excellence for increased interdisciplinary activity. Others may worry that disciplinary excellence must be acquired first before one can engage in worthwhile interdisciplinary endeavors. Yet there is increasing excitement about and acceptance of the need for more interdisciplinary research and teaching that argues for involvement of all through a culture of immersion.

At present, cultural expectations and processes involved in RTP activities do not encourage, and often discourage, interdisciplinary collaborations in research and teaching. Faculty members seeking tenure and/or promotion feel compelled to “color within the lines,” focusing on topics and using methodologies easily recognized as contributing to traditionally defined disciplines, reluctant to engage in activities that stray too far afield for fear of criticism from departmental colleagues, who write the research and teaching expectations, and outside letter writers. The same concerns are shared by those seeking reappointment.

Departments and other academic units are similarly discouraged from offering interdisciplinary courses that are, for instance, team-taught by faculty from different units, due to complexities and restrictions inherent in the “bean-counting” attached to unit finances, ownership of scheduling and space, and to the evaluation and compensation of individual faculty members.

To facilitate more interdisciplinary activity among faculty, mentoring and RTP processes and expectations must be modified to support interdisciplinary faculty and remove the real and perceived “penalties” incurred due to narrowly conceived research expectations, rigidly discipline-specific protocols for acquiring outside letters and to actively value and reward interdisciplinary activities.

Assistant professor with appointments and/or research or teaching activities across multiple units should have appointed mentoring committees that include appropriate representation from the different units who are able to encourage and support their progress to tenure. Clear statements that interdisciplinary activities are valued in the RTP process are necessary. Requests for external letters should also explicitly note that our institution values interdisciplinarity and request that interdisciplinary contributions be addressed as appropriate. Job descriptions should reflect a faculty’s interdisciplinary activities, units and departments should revise their RTP expectations to specifically address the acceptability and desirability of interdisciplinary work and outside letters for review should be deliberately sought from experts able to evaluate both disciplinary and interdisciplinary work. RTP committees and processes for faculty with appointments across multiple units should include representation from all units, and should be constructed to include members able to evaluate and speak to interdisciplinary contributions and impact . This requires administrative processes be established to ensure that all units are included in RTP communications. Organizational accountability should be instituted so that all supervisors are evaluated on their activities to support and promote interdisciplinarity in order to reify at every level of review.

With regard to interdisciplinary course offerings and other teaching endeavors, UW should appoint an administrative unit, such as the proposed interdisciplinary incubator or the ECTL, to facilitate the development of a timely and necessary interdisciplinary curricula and to mediate the numerous logistical problems posed by team-teaching, including developing mechanisms by which home departments could offset the cost of instructors participating in interdisciplinary courses and addressing the issue of determining faculty credit.

In addition to removing barriers, UW needs to incentivize interdisciplinary teaching and research. As such, the institution should provide seed funding for research and financial support for interdisciplinary teaching as well as develop research and teaching awards to explicitly recognize interdisciplinary work.

It seems that more explicit valuation of interdisciplinary work at UW will naturally integrate with other aspirations, such as expansions in internationalization and community engagement.

Near-Term Action (6-12 months)

Initiate a study of RTP policies/procedures, annual performance reviews and organizational accountability in units across our campus (Haub School, English et al.) and at other

institutions that have already successfully made changes to encourage interdisciplinary work. The product would be an informed set of specific recommendations for such changes at UW. Include pre-tenure faculty in these assessments.

Mid- and Long-Term Actions (beyond 12 months)

Implement recommendations for revisions to RTB policies and procedures and annual performance reviews.

Recognizing that changing the practices regarding tenure and promotion are, in many units, deeply engrained, the provost will need to be vigilant in managing this change.

Budgetary prospects and implications - none

Interdisciplinary Education and the Student Experience

II.9 First Year Experience: launch new curricula and Learning-Living Communities for first year students that are centered on interdisciplinary challenges, that will enhance the first-year experience, and will also set the stage for continuing experiences for undergraduate and graduate students in subsequent years.

The University of Wyoming is committed to the goal of having all first-year students engaged in a living-learning community. This will be a centerpiece of the UW experience and serve as a launch point for engagement across interests and disciplines. Building upon the success of long-running programs and partnerships managed by LeARN and Residence Life, over two decades of practice and research (Kuh, 2008; Inkelas, 2008; Brower and Inkelas, 2010; Stier, 2014; Vincent, et al., 2021), and the consideration of more recent critiques in the national conversation (Mintz, 2019; Lederman, 2020), our proposal to implement an integrated, authentic, and student-centered living and learning community (LLC) model at the UW is both ambitious and achievable. Our proposed living-learning community model activates the residential spaces on campus as communities of interdisciplinary inquiry, community building, and academic/personal growth.

As part of a First-Year Experience program that includes the proposed (new) residence halls at UW, each first-year student will engage in an annual (interdisciplinary) theme, aligned with UW's Grand Challenges. The current living-learning communities in the residence halls will participate in various ways in the residence hall theme for each year. For example, a Future of Health grand challenge-themed residence hall might house students in the Spectrum (LGBTQ+) and First-Generation LLCs, as well as Freshmen Interest Groups (FIGs) focused on Health Sciences, Veterinary Medicine + One Health, and Outdoor Recreation. These residence hall floors will have opportunities within individual LLCs--and as an entire hall--to engage in events

and projects related to the interdisciplinary theme. Theme examples include Artificial Intelligence, Social Media, Food Systems, Health & Medicine, Climate Change, Big Data, Education for the Future, Social Justice, or Energy Transitions.

Furthermore, two new organizations, the Center for Entrepreneurship and Innovation and the School of Computing will explicitly support integrative student experiences for students from all disciplines. These new organizations will develop and implement First Year Experiences and Learning-Living Communities.

In addition, Faculty Fellows (one fellow per residence hall) will occupy a 1-year position, selected through a competitive process for any faculty member at UW (akin to the UW College of Arts & Sciences Seibold Professorship). During the year-long fellowship (North Hall Fellow, White Hall Fellow, etc.) the faculty member will engage students in that hall in a variety of ways related to the interdisciplinary theme. In their application, fellows will propose programming and vision for supporting students in exploring a Grand Challenges-connected theme. Annual themes for each residence hall will be selected by an interdisciplinary committee.

The (tentative) work of a faculty fellow will be to:

- Teach one First-Year Seminar course or 2-3 First-Year Experience courses focused on the theme (possibly affiliated with a FIG or LLC).
- Continue their research programs (as appropriate) and engage campus collaborators and national/international colleagues to share their work with students.
- Coordinate student engagement programming. (4 “larger” events/year). For example:
 - Lead research lab/studio tours and experimental demonstrations with various UW faculty and continuing undergraduate and graduate students.
 - Moderate digital or analog discussion boards in the hall’s common space, posing provocative or solutions-generating prompts related to the Grand Challenges theme.
 - Curate a Visiting Scholars series, engaging students in conversations that bring new perspectives, innovators, big names, and emergent players from a range of fields and practices relevant to the theme.
 - Host themed “Dinner & Discourse” or “Breakfast & Brainstorm” gatherings, in partnership with ACRES student farm, Food Sciences, and Dining Services, etc. with the meal and related discussion reflecting the theme.
 - Organize and facilitate a service-learning experience for 50 students, in partnership with the Center for Student Leadership & Community Engagement (SLCE) office.

- Arrange an evening of lightning talks, a TEDx series, or other interactive student-faculty engagements.
- Host a monthly “drop in” podcast, documentary, article, or book club.

The annual interdisciplinary theme can also be integrated into First-Year Seminar courses, Honors colloquium, First-Year Experience, First-Year Writing, and other courses (and programming) across campus. The current Freshmen Interest Groups (FIGs) and LLCs would grow in number to accommodate (eventually) all new UW students.

An important component of the new Wyoming Innovation Network (WIN) will be the development and implementation of new academic programs, developed jointly by UW and the Wyoming Community Colleges, to provide education in those areas needed to catalyze economic development and diversity in the state. These programs will have interdisciplinarity as a pillar and will require close coordination among UW and the Community Colleges. WIN will produce a pipeline of transfer students to UW from the Community Colleges. These students will be well-suited for participation in interdisciplinary living-learning communities upon their arrival at UW.

An important goal of this First-Year Experience model is to launch several interdisciplinary undergraduate student opportunities in sophomore through senior years. As students move into their second year at UW, they will engage in subsequent opportunities for faculty-guided interdisciplinary research, education abroad, and community partnerships to enhance their understanding of interdisciplinary problem-solving--while bolstering their career exploration (and overall readiness).

Near-term Actions

Support the concept and plan development and implementation of first-year experience plans, including the inclusion of Grand Challenge themes and strategies for expanding involvement beyond first year students

Interdisciplinary Education and the Student Experience

II.10 USP Gen Ed and Curricula – encourage and support the work of the Next Gen USP committee so that the curriculum is truly university-wide and is rooted in interdisciplinarity

The Interdisciplinary Pillar Strategic Planning Committee strongly supports the charge of the Next Gen USP Committee to the following ends and invests that group with all necessary authority and resources so that the curriculum is truly university-wide and multi-level, ranging from first year to graduation, including an attention to the needs of first generation college

attendees, students of color and students from minority communities, international students, transfer students, and adult learners, at both the undergraduate and graduate levels. Such curriculum should encompass every college and unit on campus; it should be rooted in disciplinary and interdisciplinary excellence and evidence-based practices in both teaching, research, and public engagement; and it should train students and support faculty in diverse ways of knowing, question-posing, and problem-solving.

Specifically, we support the Next Gen USP committee as they work to:

- Design the new curriculum to be forward-looking, and emphasize critical, creative thinking.
- Work with LEARN and related units to augment or design curriculum for first year studies, including Living Learning Communities that builds upon existing interdisciplinary work and expands interdisciplinary offerings.
- Design curriculum for undergraduate progression that weaves interdisciplinary and disciplinary approaches.
- Foster USP curriculum that facilitates better time to graduation, student retention, and ultimately increases graduation rates.
- Promote interdisciplinary principles through capstone and internship experiences.
- Guide process for articulation with community colleges.
- Forecast the needs of this generation of students by keeping in mind that many jobs that currently exist won't exist in a decade; therefore, the curriculum should not train students for particular jobs, but for careers; the curriculum should foster diverse, adaptive ways of thinking.

Near-term Items

1. Encourage Next Gen USP group to begin work at completion of strategic plan process.
2. Charge ECTL to develop necessary seminars, institutes, and programs to support the faculty as they adapt their pedagogical practices and facilitate the development of interdisciplinary teams. Encourage ECTL to support the work of the Next Gen USP committee. Elevate ECTL as a space for interdisciplinary interactions.

Mid/Long Term Items

3. Propose best practices for supporting faculty, staff, and students in material ways. I.e. course releases. How to remove barriers/incentivize the work of collaboration?
4. Propose ways to incorporate units traditionally considered non-teaching, such as the Art Museum and the American Heritage Center.

Budgetary prospects and implications 1. Given the results at which the Next Gen USP committee arrives, the CPM process should be adjusted in order to achieve their conclusions.

Engagement

II.11 Use existing and emergent resources to enable engagement associated with interdisciplinary work to foster knowledge co-production, economic development, and workforce readiness

Interdisciplinary engagement and partnerships foster knowledge co-production, economic development, and workforce readiness. For example, strategic public-private partnerships can help make research and innovation policy more responsive to the changing nature of innovation while both developing new potential markets and serving as key instruments in addressing societal grand challenges.³

The following discussion presents four engagement foci: UW Cooperative Extension; engagement through Grand Challenges; the Office of Engagement and Outreach; and the Wyoming Innovation Network.

A. UW Extension

UW Extension (UWE) is the face of the university in communities throughout Wyoming. UWE provides educational experiences, resources, and community collaborations which empower people to make choices that enhance their quality of life. UWE provides an inclusive, safe, and supportive learning environment for Wyoming youths and adults. UW Extension engages with local, state, tribal, national, and global constituencies to enhance communities, business enterprises, and the quality of life for community members. Extension facilitates interdisciplinary collaboration between the university and its constituents to address complex economic, environmental, and social challenges through research, education, and collaboration. UWE programs teach entrepreneurship and promote economic diversification, it prioritizes public and private partnerships that strengthen the College and University, State, and local communities, recognizing that the long-term resilience of these entities is intertwined.

UWE can provide leadership to campus-wide engagement with Wyoming communities by providing the organizational structure, established relationships with community leaders, facilities, personnel, and external funding. UW Extension provides Wyoming with relevant, objective, and impactful educational programs for youth and adults in STEM, personal finance, business development, agriculture, arts, and life skills developed through thoughtful needs assessment and reciprocal relationships with community partners. Our educational programs are explicitly designed to meet the changing educational, research, and economic development needs

of Wyoming communities. UW Extension is an important part of the culture of Wyoming communities. UWE has a legacy of service to these communities and UWE remains eager to lead UW's expanded effort to address contemporary challenges throughout Wyoming.

UWE promotes university wide engagement. A recent initiative is a joint Honors College/UWE project funded through the Provost's Strategic Initiative to place UW faculty and students at 3 sites across the state to address identified needs in these communities through discussion with community leaders. From this, a suite of projects will be developed that would evolve into student capstone projects and larger initiatives. Students will work in teams with local Extension Educators, community stakeholders and campus-based faculty. The larger goal is to provide greater opportunities for UW faculty to collaborate in communities in meaningful ways, delivering value through faculty expertise and resources and learning from community partners, to expose students to professional opportunities in Extension, and to provide them with opportunities to serve Wyoming communities.

A second UW Extension initiative is to provide adjunct faculty appointments for faculty across campus to participate in Extension activities in collaborations with field-based Extension Educators developing projects of mutual interest which address the educational or research needs Wyoming communities.

B. Engagement through Grand Challenges: Rural Health Issues Example

External engagement is inherent in the UW Grand Challenges, identified over the past two years. Each of the five Grand Challenges themes includes innovative ways to engage the state in the production and dissemination of research and teaching.

For example, one Grand Challenge theme is Rural Health Issues. Health is a multidimensional issue that touches everyone. It involves preventative health, well-being, healthcare access, the treatment of diseases and disorders, mental health, disability, and healthcare policy – all interwoven within a dynamic matrix of social, economic, technological, and political forces.

The University of Wyoming is well-poised to address important Rural Health grand challenges. UW has established relationships with the Wyoming Department of Health and many key stakeholders across Wyoming. UW's faculty and staff have expertise in addressing health disparities across Colleges, departments, health professions and disciplines. UW Extension Educators and faculty Specialists conduct community-based educational programming to address rural health issues in several Wyoming communities.

The College of Health Sciences, with faculty and students already engaged throughout the state and region, is positioned to play an impactful role in community engagement for ensuring the health and wellbeing of the citizens of Wyoming and the Mountain West region. The College proposes to establish an interdisciplinary Rural Health Innovation Institute (RHII) that will leverage our strong academic programs and key initiatives in the College to address Wyoming's healthcare and economic diversity needs while becoming a national and international model for

rural health innovation. The RHII's transdisciplinary approach is rooted in the identification of state and community needs, application of new or evidence-based strategies for addressing the needs and economic development related to community health and healthcare. The RHII will exemplify the mission of a land grant institution and become the model of rural health innovation for the nation and beyond.

C. Office of Engagement and Outreach

UW's Office of Engagement and Outreach (OEO) was established in 2018 to serve as a portal to UW for the citizens of Wyoming (and beyond) and to coordinate and streamline engagement and outreach efforts to achieve enhanced consistency, follow through, and impact. A major goal of the OEO is to build capacity to apply for the Carnegie Foundation's *Classification for Community Engagement* and other institutional community engagement designations, such as the Association of Public and Land-Grant Universities (APLU) *Innovation and Economic Prosperity Universities* designation.

Moving forward, it is envisioned that the OEO should still provide a centralized coordination role but with most of its resources allocated more broadly across campus to more directly support on-the-ground activities spearheaded by colleges, schools, departments, and centers and institutes.

D. Wyoming Innovation Network (WIN)

The Wyoming Innovation Network (WIN) is an emergent network of closely collaborating partners that jointly develop education initiatives to strengthen the state's workforce, promote entrepreneurship and actively support economic growth and diversification. The University of Wyoming is a key member of WIN, as are the state's seven community colleges. The WIN will engage with community and business partners to build and execute an education, economic development and innovation masterplan for how Wyoming's educational institutions can better identify educational needs throughout the state.

The WIN has identified (as one of five components) that UW and the community colleges must become more interdisciplinary and systems-oriented. To achieve this pillar, the WIN will pursue a systems approach that leverages partnerships and cross fertilization to provide better mechanisms for faculty to collaborate on solutions to Wyoming challenges, and to enrich the educational offerings for its students. With input from the Wyoming Business Council and Wyoming Business Alliance, these educational activities will be directly coupled to new corporate partner networks and innovation training centers, to provide opportunities for students and faculty alike to support the growth of economic advancement throughout the state. In doing so, the WIN will enrich the student experience at all of its member institutions through development of collaborative courses and other programs.

Near-term actions

1. Assess progress on OEO strategic plan, and identify next implementation steps
 - This includes an assessment of progress made on Carnegie Engagement University designation application.
2. Complete an inventory of existing engagement assets.
3. Initiate UWE - Honors College strategic initiative as soon as funding is available. Begin recruiting students fall semester 2021.
4. Enhance UWE support for students through county extension offices. This includes internet access, exam proctoring, and use of facilities and support for online degree programs.
5. UWE 4-H and student recruitment – “4H - your first class at UW program” with access to 1009 courses in CANR. Foster opportunities for 4-H members to engage with UW faculty, facilities, and the campus community.
6. Identify cross campus expertise and interests in rural community health and health care issues.
7. UW faculty and staff will serve on the WIN's committees that develop the necessary programs and systems, while also liaising with UW's internal efforts to enhance interdisciplinarity.

Mid-term action

1. Identify opportunities for participation in other state, regional and national organizations involving interdisciplinary research and engagement.
 - APLU Innovation and Economic Prosperity Universities designation.
 - Also, for example: <https://www.eda.gov/resources/organizations/>
2. Draft final version of adjunct professorship program through UWE for approval by College leadership and Provost by fall semester 2021. Initiate fall semester 2021.
3. Reconsider UWE initiative team structure to ensure that educational programming aligns with President Seidel's 4 Pillars.
4. Formalize role of UWE field extension educators and 4H in university wide student recruitment.
5. Identify funding opportunities to establish Rural Health Innovation Institute.

Long-term actions

1. Continue to build capacity, relevance, impacts, and community-based support for UWE. This initiative includes the transition from an area-based educational program delivery structure to a county-based structure, redesigning initiative teams, and additional off-campus faculty resources.
2. Initiate a broader resource development strategy to identify private donors who can support county-based extension faculty and their programs.
3. Leverage the network investment in Research and Extension centers and formalize the

role of county Extension offices in Innovation Hubs.

4. Leveraging international health and health care networks for dissemination of evidence-based strategies for addressing international rural health and health care needs.

Budgetary prospects and implications

1. Administrative support required
2. Near-term actions don't have substantial cost
3. Expanding partnerships in mid- and long-term actions will have personnel needs. Resource requirements need to be further identified.