Creativity, Innovation and Entrepreneurship (CIE)
Strategic Area Advisory Team (SAAT)
DRAFT 11/14/13

CIE SAAT Summary Recommendation

In sum, our SAAT unequivocally believes that Creativity, innovation and entrepreneurship (CIE) should become one of UConn’s major strategic initiatives. The CIE SAAT concluded that a strategic investment in CIE is a necessary condition for success in: 1) enabling cross-disciplinary discovery of new knowledge; 2) developing differentiated educational outcomes and competitive advantage for our students; and 3) capturing implementable solutions to the complex problems facing society, the global economy, and its associated markets.

The SAAT envisions a university-wide culture which strongly emphasizes an environment in which students, faculty, and staff “imagine and invent the future,” as opposed to prepare for it. This culture would promote inter- and trans-disciplinary research, teaching, and service/outreach/public engagement, all while respecting the value of disciplines and disciplinary knowledge; would provide a range of options for how faculty, students, and staff can be involved in relevant activities; would emphasize both the economic value of CIE and the personal benefits of living a more creative, fulfilling life; and would serve as a magnet to attract creative, innovative and entrepreneurial faculty, students, and external collaborators to UConn.

A perceived lack of emphasis on or acknowledgement of the importance of CIE could become a competitive disadvantage when trying to attract talented students and faculty. Under-investment in CIE infrastructure (e.g., programs and facilities) could inhibit public-private collaborations and either damage an institution’s reputation as a “leader” or place it perceptually in the “follower” category.

Introduction

From creating works of art, producing abundant inexpensive water, developing non-invasive health devices or net zero energy homes, finding medical cures, restoring and improving urban infrastructure, generating new energy sources, and preventing nuclear terror, to developing sustainable ways to solve complex geopolitical problems, the ability to produce and implement new, useful ideas is rapidly becoming a critical attribute for the leveraging of knowledge and increasing the quality of life.

The CIE SAAT discussed the current context that lies at the heart of the broad societal need and desire for creativity, innovation and entrepreneurship, with particular attention to the intersection of changes that have occurred in higher education, the knowledge economy, and student and faculty culture. The result was the
identification of several potential opportunities that arise from a University strategic thrust in Creativity, Innovation and Entrepreneurship.

Creativity, entrepreneurship, and innovation are inextricably connected but distinct concepts. Creativity involves the generation of new ideas or new associations between existing concepts. Innovation is the application of such creative ideas and concepts in some specific context with an eye toward producing results that are original, useful, appropriate, and actionable. And entrepreneurship focuses on the identification and capture of opportunities where needs are satisfied, value is created or challenges solved by the innovation and creative idea.

Creativity, innovation and entrepreneurship have been relentless over the past 50 years and have produced solutions with inestimable value from inter- and trans-disciplinary thinking. Such solutions are solving both societal problems like AIDS, hunger, and environmental challenges and market needs exemplified by major innovations in areas as diverse as transportation, energy, computers, digital music, GPS, the internet, online retailing, smart phones, stem cells, portable defibrillators, protease inhibitors, drought resistant crops, Khan Academy and the Buri Khalifa. These and countless other products of human ingenuity stand on the shoulders of creative, entrepreneurial and innovative thinkers. And clearly, the need and desire for creativity, innovation and entrepreneurship continue unabated, growing both exponentially and globally.

It is no wonder why! The current wave of economic growth has its roots in knowledge based economies. That said, new knowledge now diffuses across the globe instantaneously and the life cycle of its competitive advantage is short-lived. As a result, there is a well-documented, shifting global paradigm from knowledge-based economies to creativity, innovation and entrepreneurship-based economies. Put differently, in an age when much of the world’s information and knowledge base can be quickly accessed on hand-held devices, a premium is currently placed on the ability to use that knowledge in creative, innovative, and entrepreneurial ways to produce valuable outcomes, and, as well, solve the many complex problems facing humanity. The ideas and solutions for these outcomes are wide-ranging and multidisciplinary in that they are not limited to a particular domain, as the examples provided above readily illustrate.

It is no surprise that creativity, innovation and entrepreneurship have become a focus of national economic development and education policies in several countries, and many groups are advocating for a similar emphasis in the United States. The demand for a creative, entrepreneurial, innovative, and critical thinking workforce is only projected to increase and intensify in coming years, providing a tremendous opportunity for universities that value and promote CIE.

In addition to these societal and political forces, the characteristics of future students and faculty are changing. Recent demographic research provides evidence that the millennial generation embraces and desires change through CIE, defined broadly, more than previous generations. The demographic trends suggest that a creative, entrepreneurial and innovative orientation, in addition to meeting future societal needs, may be a necessary condition for universities to attract talented students and faculty in the future.

Some evidence exists that expanding resources are being dedicated to increase and enhance research in creativity, innovation and entrepreneurship. Several federal agencies have created new CIE funding programs in recent years, and the private sector has embraced the value of CIE, suggesting that public-private partnerships could be increasingly viable.

Creativity, innovation and entrepreneurship are becoming critical factors for both cultural development and economic success. Future students and faculty appear likely to place increasing value on institutions that emphasize CIE, and where there are numerous opportunities for collaborative research and teaching.
service-learning, economic and community development and other forms of public engagement in these areas.

At the same time, many of these opportunities have a dark side and could quickly become threats. For example, a perceived lack of emphasis on or acknowledgement of the importance of CIE could become a competitive disadvantage when trying to attract talented students and faculty. Under-investment in CIE infrastructure (e.g., programs and facilities) could inhibit public-private collaborations and either damage an institution’s reputation as a “leader” or place it perceptually in the “follower” category.

The CIE SAAT concluded that a strategic investment in CIE is a necessary condition for success in: 1) enabling cross-disciplinary discovery of new knowledge; 2) developing differentiated educational outcomes and competitive advantage for our students; and 3) capturing implementable solutions to the complex problems facing society, the global economy, and its associated markets.

The CIE SAAT acknowledges that numerous UConn programs are actively engaged in CIE activities, some of which have international reputations in one or more of these areas. However, it is the belief of the SAAT that CIE should be highly visible across all of the university’s programs and activities, and in all aspects of university life.

The SAAT envisions a university-wide culture which strongly emphasizes an environment in which students, faculty, and staff “imagine and invent the future,” as opposed to prepare for it. This culture would promote inter- and trans-disciplinary research, teaching, and service/outreach/public engagement, all while respecting the value of disciplines and disciplinary knowledge; would provide a range of options for how faculty, students, and staff can be involved in relevant activities; would emphasize both the economic value of CIE and the personal benefits of living a more creative, fulfilling life; and would serve as a magnet to attract creative, innovative and entrepreneurial faculty, students, and external collaborators to UConn. This culture would not be temporally-bound; CIE resources and support could continue after a student graduates, with heavy alumni involvement and community outreach/engagement.

UConn has several unique attributes/characteristics and contextual factors that anticipate the successful pursuit of this vision, including complementary resources from NextGen CT, Bioscience CT, the Innovation Partnership Building at the Tech Park, the cluster hire program, and related university initiatives; a growing and continuously improving quality of student body and research/teaching faculty; having some of the top thinkers on CIE, both generally and as embedded within specific disciplines, already on the faculty or otherwise affiliated with the university; existing university-level inter- and trans-disciplinary programs that can be enhanced and/or leveraged (e.g., Innovation House, Innovation Quest, student IDEA grants, the Technology Incubation Program, the Innovation Accelerator – all which help students navigate the chasm that exists between a creative idea and the innovative capture of its value); and increased interest from UConn alumni and potential for endowment from CIE-minded friends of UConn.

The SAAT discussed ways in which strategic investment in CIE can serve both UConn and the State of Connecticut in the areas of research, teaching, and service/outreach/public engagement. The SAAT saw all three potential areas of activities as equally important and beneficial.

In sum, our SAAT unequivocally believes that Creativity, innovation and entrepreneurship (CIE) should become one of UConn’s major strategic initiatives to guide future research and practice.

1. What are the specific, original, and unique aspects of the strategic area that UConn should pursue?

CIE is already an important mission for multiple constituencies/stakeholders both across UConn and in its network, but much more can be accomplished and achieved if this area receives strategic investment from
the University. Strengths in CIE, as noted above, exist already, and the following representative goals can be achieved if CIE is ultimately selected as one of the areas of strategic importance:

A. Our outstanding faculty will conduct cutting edge research on CIE related topics and in combination with our students engage in the creative, innovative and entrepreneurial search for solutions to the complex problems of society and markets worldwide;

B. Funding will be devoted to support impactful projects that are creative, innovative, or entrepreneurial;

C. CIE will be translated into innovative products and services that advance commerce and improve society;

D. CIE will be emphasized in undergraduate, graduate, and post-doctoral education, contributing to a differentiated education and a competitive advantage for our students; and

E. A proposed institute will serve as both an enabler and a clearinghouse for CIE efforts across the university;

To elaborate on #5, our SAAT believes that the selection of CIE as a strategic area of importance will make a difference for the University if we can create a mechanism to fulfill the objectives listed above. We propose the development of a University-level institute to coordinate, enable and implement all CIE efforts across the University. In and of itself, such an Institute would not significantly differentiate the University of Connecticut from its peer or aspirant institutions but would if developed in combination with a university strategic investment in CIE. This would be a unique and differentiating combination in higher education.

We propose that the Institute serve as a 1) forum for inter- and trans-disciplinary connections, communication, and cooperation, 2) venue for University researchers and artists to connect and work with each other and external stakeholders, and as a 3) source of starter grants to support creative, innovative, and entrepreneurial inter- and trans-disciplinary projects – both basic and applied.

2. What are the intellectual merits of the strategic area in advancing the field?

The CIE institute will identify faculty with the ability to generate or recognize ideas or possibilities for solving problems, support the development of creative/imaginative and innovative solutions, and help communicate these solutions to relevant stakeholders. As an example, CIE will facilitate the creation of novel products of societal, artistic, and/or commercial value, help to generate new ideas and concepts, and then pursue pathways that enable faculty to transform these ideas into products of worth and value to society and commerce. CIE will give our faculty and students a venue to identify new solutions to problems and create new modes of expression that will enable our faculty and staff to transform new and imaginative ideas into innovative products and performances of value and solve problems in our community, region, state and country.

It is important to acknowledge that at least some of the merits of CIE may accrue to UConn because CIE is such a valued part of the UConn milieu. However, the absence of a formal mechanism for connecting and encouraging creativity efforts across the schools and colleges is likely to result in an absence of focus on CIE. Serendipity may result in inter- and trans-disciplinary cooperation, which is much less likely to occur if a formal mechanism, such as the CIE institute, does not exist to facilitate connection and communication. Put differently, without a dedicated and active space, it is highly unlikely that, for example, business faculty, anthropologists, psychologists, and philosophers will cross paths in meaningful ways at the University. But all parties have a great deal to learn from each other, and a great deal to create and innovate together. UCONN stands to benefit from such novel collaborations. An intense and conscious drive to encourage CIE and integrate it into the transformational part of our academic life will only occur if we recognize this strategic area for investment and funding.

3. What are the transformative aspects of the strategic area?

CIE provides the University with the ability to shift our paradigm from a university in which just learning advanced content is the norm to one where faculty and students create and apply such content in creative, innovative and entrepreneurial ways. The strategic importance of CIE includes the opportunities to:

A. capitalize on the transformation from an information economy to an innovation economy;
B. emerge as a leader in the growing national emphasis on CIE across Academe, Industry, and the Public Sector;
C. attract and recruit top faculty and student talent and their growing interest in context and cultures that embrace CIE;
D. engage collaborative private sector partners;
E. enhance opportunities for basic and applied research and projects with inter- and trans-disciplinary as well as university/university and university/private partner collaboration; and
F. demonstrate the demand for CIE and critical thinking and critical making in today's and tomorrow's workforce.

4. What strengths and potentials exist at UConn in the strategic area?
Creativity, Innovation, and Entrepreneurship is both practiced and exhibited in the fourteen Schools and Colleges across our University, from the College of Agriculture and Natural Resources to the School of Social Work. UConn’s faculty regularly leverages CIE to produce outstanding work product in their classrooms, laboratories, research papers, artistic contributions, and public engagement. For a number of faculty, CIE is the focus of their academic research and teaching pedagogy – these include but are not limited to: Ron Beghetto, James Kaufmann, Jonathan Plucker, Sally Reis, and Del Siegle in Educational Psychology; Rich Dino, Tim Folta, Lucy Gilson, Nora Madjar, and Zeki Simsek in Business; Hadi Bozorgmanesh, Horea Ilies, Kazem Karounian, Jeff McCutcheon, and Arash Zaghi in Engineering; and Deborah Dancy and Kenneth Fuchs in the School of Fine Arts. In addition to our faculty strengths, the following numerous institutional strengths exist:

A. growing expertise in CIE within the University’s signature programs, in combination with new strategic investments in the University through NextGen Connecticut, 21st Century UConn, and other initiatives (i.e. TechPark, BioScience, Jackson Labs, etc.);
B. growing and continuously integrating CIE into research/teaching through existing University-level inter- and trans-disciplinary programs that can be enhanced/leveraged (e.g., including but not limited to Innovation House, Innovation Quest, Technology Incubation Program, etc.);
C. existing School-level programs that can be enhanced, leveraged and expanded to University-level e.g., including but not limited to the Innovation Accelerator, and business plan competitions; and an
D. entrepreneurship minor offered by School of Business and Gifted and Creative Students Program in the Neag School of Education.

5. What investments will be required to attain preeminence?
Many of the faculty are already in place due to investments by the College of Liberal Arts and Sciences and the Schools of Business, Education, Engineering, and Fine Arts, although additional focused investment in CIE faculty in the next several years would greatly increase the effectiveness of CIE and, again, significantly differentiate the University as a reputational hub for CIE.

More importantly, creating the Institute would require UConn to provide a substantial amount of funding, of no less than $500,000 per year for three to five years, to fully support it. This funding could be used to provide:

A. buyouts for a full-time director and an associate director; (who work closely with a trans- and inter- and trans-disciplinary Advisory Board of stakeholders both internal and external to the University)
B. an administrative assistant of appropriate stature;
C. a physical site for the institute;
D. start-up grants for faculty to pursue collaborative inter- and trans-disciplinary research;
E. grants to support extra-mural conferences, brown bag seminars, and other opportunities to create connections among CIE researchers throughout the university and stakeholders across the state; and
F. the purchase of relatively inexpensive equipment and materials for CIE focused research and development.

6. Does the strategic area contribute to high-quality education and training of undergraduate, graduate and post-doctoral fellows? If so, how?

In sum, the answer is yes – specific examples include areas, such as the Gifted and Creative Students Program in the Neag School of Education, but more generally by transforming opportunities for all undergraduate and graduate students’ thinking from lesson learning to problem solving.

The demand for CIE education and training coursework is considerable and growing. Fortune 500 companies invest heavily in programs designed to help their employees think creatively, innovatively, and entrepreneurially, as they attempt to both exploit their current portfolio of products and services and explore new markets and discoveries. Several countries have creativity, innovation and entrepreneurship as the backbone of their national education plans and policies (e.g., China, South Korea, Saudi Arabia). And groups such as the Partnership for 21st Century Skills are successfully advocating for a focus on CIE within education.

At most universities, the major barriers to addressing the need for CIE education and training include (1) a lack of human capital, given that most institutions have at best, a handful of people working and teaching in these areas, and (2) distance between potential participants, who are both distributed and reside globally.

With respect to the first barrier, as an example, UConn has made a historically unprecedented investment in faculty specializing in creativity research and pedagogy. In addition to the vibrant international reputations of faculty in the Gifted and Creative Education program, several well-known creativity scholars have been hired over the past year to build on this already impressive strength. With relatively limited investment, three to four strategic faculty hires who specialize in innovation and entrepreneurship research and pedagogy would create an unprecedented capability across the whole of CIE. With these limited hires, UConn would immediately gain a reputation for having, literally, the largest and strongest CIE faculty cluster in the world. Regarding the second barrier, offering coursework in both traditional and online contexts will allow access to the widely distributed market for CIE education.

The CIE SAAT sees a major advantage for UConn CIE academic programs in a tight link between the university’s CIE research, teaching, experiential learning, and value capture capabilities – as befits a major research university, the results of faculty and student research should be translated quickly into the classroom, maximizing the research’s impact and benefits, turned into best practices that benefit all stakeholders, and applied/captured in a relevant domain.

One possible academic program could be a minor/certificate program for both undergraduate and graduate students, no matter their discipline. Such a program could involve a 4-5 course sequence, with the first course being an introductory survey course on CIE topics. Students would next be required to take two courses from a pool of three focusing on, for example, individual, group, and organizational CIE. The final 1 or 2 courses would be applied CIE content, drawn from a large pool of related courses or programs already offered at UConn or to be developed. This approach should both encourage inter- and trans-disciplinary cooperation, while reinforcing the notion that disciplinary knowledge is a valuable part of any creative, innovative or entrepreneurial endeavor. In a similar vein, the CIE SAAT discussed the notion of adding a general education requirement for all undergraduates of at least one course that directly deals with CIE content, whether or not a student chooses to participate in an expanded CIE curriculum or program.

Another potential program, this one designed to enable successful commercialization of creative ideas and their innovative application could center around a 30 credit Master’s degree in, for example, technology commercialization – again, the potential exists such that it can be delivered traditionally, online, or in a blended format.
A related but distinct set of activities could involve consulting with faculty and other instructors to provide advice on how to incorporate both CIE content and pedagogical approaches into their teaching. These consultations could take many forms, ranging from one-on-one consulting with instructors to teaching workshops for specific programs or the general university community.

Another possibility, the development of instructional CIE resources, collected and organized and made widely available to faculty, that can serve as a resource to those interested in incorporating CIE content into their course delivery, facilitate CIE teaching across the university.

7. Does the strategic area contribute to the growth of extramural research programs? If so, how?

With strategic investment in CIE, there are a number of activities and services that could promote extramural research programs, including providing research infrastructure support for faculty and students pursuing external funding for CIE projects, and providing seed money grants for proof-of-concept projects that could lead to external funding. Such proof-of-concept mini-grants could prove especially useful when inter- and trans-disciplinary teams are working together for the first time, and/or when they are proposing highly innovative projects that would benefit from pilot work. A CIE infrastructure, in general, will support increasingly common requirements for practical implementation of results from federal agencies and new state programs, such as the $200 Million Life Science Fund.

Furthermore, the creation of a visiting scholars program in which external researchers, inventors, entrepreneurs, etc., visit campus for 1-2 week periods can be highly integrated into university, college and school activities (e.g., guest lecturing in multiple classes, prearranged meetings with faculty, workshops in centers). These visitors will bring new ideas and perspectives into our academic programs and work efforts, promote collaboration with the visitors and their organizations, and strengthen the University’s network with external innovators.

Collectively, these and related activities, in addition to sparking envelope-pushing CIE research, would highly likely serve as a model and catalyst for similar inter- and trans-disciplinary efforts at other institutions and in the private sector, from which our faculty, students, and staff could all benefit.

8. Does the strategic area contribute to collaborations among schools and colleges? If so, how?

Yes. The CIE SAAT sees the potential for much stronger and more numerous connections developing across the relevant theoretical work advanced by faculty from all Schools and Colleges, artistic insight and reflection, applied sciences, applied engineering, social sciences, and business. A number of CIE initiatives could be undertaken in an effort to maximize and capitalize on the value of the inter- and trans-disciplinary ideas and innovations of university faculty, students and staff across all UConn Schools and Colleges, in addition to the aforementioned potentially increased collaborations between UConn faculty and students and individuals and organizations external to the university. Specifically, a CIE signature program could support, enable and leverage the creativity, innovation and entrepreneurship efforts of faculty, students, and staff involved in the eight other potential signature programs such as those in Genetics, Genomics, and Personalized Medicine, Advanced Materials and Manufacturing, Brain, Mind, and Cognitive Processes, Sustainability and Resilience: Environment and Energy, Public Health and Wellness, Social Justice, Humanities and the Arts, and Complex Systems and Big Data/Secure Computing. (Please refer to the introductory paragraphs of this document for related examples.) There is much potential in interconnectedness, leveraged by a CIE knowledge base and culture.

9. What is the broader impact of the strategic area for promoting:

A. Diversity – Intellectual diversity will be a focus of the creative, entrepreneurial and innovative people, organizations, and institutions that we study; in addition, recent literature provides clear evidence of the significant difficulties faced by minority innovators and entrepreneurs, in general as compared to those of the majority, and specific challenges in the area of obtaining financing, CIE problem-solving could study and help to resolve issues such as this.
B. **Globalization** – CIE activities are no longer limited to one country or to rich and affluent countries. In fact, it is through CIE activities that the emerging countries can develop with a shorter timeline. The Institute could study and help to facilitate such development.

C. **Community outreach** - The Institute should induce a significant increase in entrepreneurial activities in CT and beyond. New and expanded businesses should bring increased revenues to our state and towns, expand employment opportunities for our workforce, and produce engaged citizens and institutions in our communities.

D. **Societal impact** – A strategic focus on CIE will not just lead to commercial opportunity capture, but will also lead to social entrepreneurship and solutions that benefit society. And, of course, mutual benefit can arise from creative, innovative, and entrepreneurial activities that both turn a profit AND help to resolve societal issues.

E. **Economic Development** - See the above two areas. Societal and commercial entrepreneurship (and intrapreneurship for that matter) will strengthen the Connecticut economy through the creation of new businesses, new jobs, and perhaps even new ownership patterns, providing more and opportunities for broader constituencies. A University-level strategic emphasis on CIE would serve as *THE* antecedent.

10. **If investments are made in the strategic area, what are the metrics to be used to measure success?**

   The metrics used will be inclusive and specific. A preliminary list of examples starts with traditional measures such as: the numbers and types of inter- and trans-disciplinary projects initiated; inter- and trans-disciplinary and extra-mural events that are undertaken/conducted; the number of invention disclosures, patent applications and awards; license and options executed; the number of start-up companies; the income derived from University licenses; sponsored research dollars; external grants awarded; investments by stakeholders and supporters; and a host of other metrics such as increase of arts, literary, and scholarly creative productivity. Additionally examples of some non-traditional metrics could include increased demand for UConn students from hiring organizations and institutions; higher starting salaries; the quality of graduate schools that accept our students for advanced educational programs; the quality of an external partnering research institution/organization; the number of lead stories in national venues about UConn’s CIE culture and productive outcomes. Although more thought must be given to appropriate success metrics, this list is meant to be representative.

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See, for example, the list of members of the Partnership for 21st Century Skills: http://www.p21.org/about-us/strategic-council-members.

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