

Undergraduate Research Task Force Final Report – August 3, 2012

Executive Summary

In this report, the Undergraduate Research Task Force (UGRTF) provides a definition for undergraduate research and creative endeavors based on an evaluation of K-State values and an assessment of peer and benchmark institution programs. The UGRTF defines this as:

Undergraduate research and creative endeavors are defined as scholarly, collaborative, authentic, original work or an assessment from new point of view conducted by a student or group of students within a mentored environment for the purpose of publicly disseminating the information through a university seminar, poster/oral conference presentation, performance, exhibition, and/or publication. The projects shall involve inquiry, design, investigation, research, scholarship, discovery, application, writing and/or performance to a greater or lesser degree depending on the discipline

The UGRTF evaluated benchmark and other notable institution programs and provides an environmental scan of best practices and examples of what can be accomplished at Land-Grant universities such as K-State. The Task Force compared the Vision 2025 Benchmark Institutions as well as 8 other institutions. In this report, the UGRTF provides two appendices of data on these. In addition, materials from the Council on Undergraduate Research, including a recently-published “best practices” document were considered by the UGRTF for this report.

Assessment practices and models were also evaluated. An assessment plan has been put forward in the report with four key goals:

Goal 1: Develop a comprehensive assessment plan for KSU Undergraduate Research

Goal 2: Create an online database and interface for students, faculty, and staff

Goal 3: Survey graduating seniors and recent alumni about their experiences

Goal 4: Substantiate qualities of impact

Promotion and recognition of undergraduate research and creative endeavors were also considered and evaluated in the context of benchmark institutions. A list of 18 proposed tactics are presented followed by a Strategic Action Plan with 20 proposed activities, together with short, medium, and long-term goals, and an estimate of the resources needed to launch a Center for Undergraduate Research and Creative Endeavors.

Undergraduate Research Task Force

Final Report – August 3, 2012

The Task Force:

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- Alysia Starkey, Asst. Dean of Academics, K-State Salina
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- Farrell Webb, Associate Professor in Family Studies and Human Services, College of Human Ecology

The Charge:

K-State 2025 calls for increased participation by undergraduate students in expanded opportunities for meaningful research. A key university measure of progress towards our visionary goal of becoming a Top 50 public research university is the percentage of undergraduates involved in formalized research and creative experiences. The campus-wide task force is charged to develop an action plan to encourage, increase, and measure the participation of undergraduates in research, scholarly and creative activities, and discovery (RSCAD) at Kansas State University.

The Undergraduate Research Task Force (UGRTF) will specifically address undergraduate research and creative activities and outcomes outlined in the K-State 2025 RSCAD and Undergraduate Educational Experiences Themes. Topics to be addressed are a definition of undergraduate research and creative endeavors, an environmental scan of comparable institutions (models for conducting undergraduate RSCAD), assessment (metrics and methods for measuring and tracking it), how to encourage and celebrate undergraduate research, and, in general, the resources needed to expand undergraduate research opportunities. A report, with specific action items and metrics for success was requested.

Key Assumptions:

- In order to become a top 50 public research university in today's world, Vision 2025 expects that there will be an increased participation by undergraduates in RSCAD through expanded opportunities.
- Under RSCAD in Vision 2025, we will be competitive among our peers in the percentage of undergraduates involved in research.
- Successful integration of undergraduate education and meaningful research will be standard practice.
- Participation in undergraduate research will be a factor in improving retention and time to graduation.
- Creation of scholarship by undergraduates will increase as the result of their participation in research and creative endeavors at Kansas State University

The Process:

The UGRTF began meeting on March 8, 2012, and continued with meetings on a near-weekly basis until May 3rd. At the first two meetings, the definition of undergraduate research and creative endeavors (hereafter "research") was developed by the TF. The TF was then divided into three subgroups with focus areas that included developing an Environmental Scan (chair – Jane Garcia), an Assessment Plan (chair – Fred Burrack), and Celebrating & Promoting Research (chair – Keith Hohn). Subgroups presented their findings for discussion and developed sections of this report. The final report was compiled by the TF chair with review and input from the subgroup chairs and finally vetted through the entire TF.

A Definition of Undergraduate Research and Creative Endeavors:

The UGRTF considered a number of critical attributes of undergraduate research. Key components of a definition should include:

- An authentic research project
- Setting the bar high – not just bean counting or credit counting
- Interpolating from the faculty, postdoc, PhD student, Master's student....
- Public dissemination
- A project with evidence-based design
- New knowledge creation - adding to the body of knowledge
- A mentored experience
- Utilizing skills, not just learning skills
- Leading to unique creative solutions or discovery
- A project that is Individual or collaborative
- An activity that enhances professional self-awareness

Finally, definitions that were found on several university websites and the Council on Undergraduate Research were considered. Borrowing from several of these sources, most notably the University of North Carolina-Chapel Hill, the UGRTF proposes this definition for Kansas State University:

Undergraduate research and creative endeavors are defined as scholarly, collaborative, authentic, original work or an assessment from new point of view conducted by a student or group of students within a mentored environment for the purpose of publicly disseminating the information through a university seminar, poster/oral conference presentation, performance, exhibition, and/or publication. The projects shall involve inquiry, design, investigation, research, scholarship, discovery, application, writing and/or performance to a greater or lesser degree depending on the discipline.

Consideration should include **credit-bearing research/creative endeavors** that occur as a result of programmatic expectations. For example, a research/creative project as a required capstone expectation should be considered and

assessed as research. At Kansas State University there is significant research with which a student gains credit. Research should be judged on its merit within the defined qualifications.

An Environmental Scan of Undergraduate Research and Creative Endeavors:

The subcommittee collected information on the subject of undergraduate research from a total of 16 institutions (including Kansas State). Appendix A contains additional information about benchmark institutions; Appendix B includes information from another eight universities to represent a range of academic environments. Committee members relied on website content supplemented with telephone contacts when possible.

Benchmark Institutions* (Ordered by Number of Top 50 Categories)	Additional Institutions
North Carolina State	Carnegie Mellon
Iowa State	Florida State
Colorado State	Michigan
Oregon State	New Hampshire
Clemson	North Carolina A & T
Oklahoma State	Penn State
Kansas State	Texas A & M
Auburn	Tuskegee

*<http://www.k-state.edu/2025/documents/K-State%202025%20-%20Where%20Are%20We%20Now%20Presentation.pdf>

*Why Benchmark K-State? (available at <http://www.k-state.edu/2025/documents/K-State%202025%20-%20Where%20Are%20We%20Now%20Presentation.pdf>)

General Trends and Observations (KSU excluded from below observations)

Infrastructure of Programs:

- 10 of 15 institutions reflect some sort of “centralized” approach to undergraduate research (including 6 of 7 benchmark institutions). Coordination or organization of programs range from an administrator with a desk (North Carolina A&T) to both administrative and student work space to support activities (Colorado State).
- Institutions convey a heavy reliance on grants and endowments; institutional support for funded positions varies greatly (Texas A & M and Colorado State at the high end). Some programs also include graduate assistant positions.
- In a number of instances, offices for UG research also oversee programs for national scholar development (e.g., Oklahoma State, Carnegie Mellon, Texas A&M), which may represent a consolidation of resources for some. (One administrator commented that UGs who typically compete for national fellowships/scholarships typically have undergraduate research experience.)

Program Components (including examples of Special Functions & Features):

- Almost all offer a dedicated web site for undergraduate research highlighting program components and providing links to department specific activities
- Workshops and/or classes for UGs on topics such as research ethics, presenting research, and writing proposals (e.g., Carnegie Mellon, North Carolina State, Oregon State, Texas A & M)
- Mentoring workshops (e.g., Iowa State, Texas A & M)
- Summer research programs (e.g., Auburn, Clemson, Michigan)
- Programs that target freshman (e.g., Clemson, Oklahoma State)
- Support of research conducted at external locations/private sector (e.g., Colorado State) or through international/study abroad initiatives (e.g., Carnegie Mellon, Florida State)
- Funding of undergraduate research projects (e.g., New Hampshire, Oklahoma State)

- Travel awards for student presentations (e.g., Carnegie Mellon, North Carolina State, Penn State)
- Graduate students who serve as mentors (e.g., Clemson)
- Online mechanism to connect students to faculty in areas of interest (e.g., Colorado State uses electronic database; Oklahoma State posts projects) or as a specific program (e.g., Florida State)

Promotion, Recognition & Dissemination (themes and examples):

- Annual symposiums of some type appear quite common
- Use of “blogs” to promote communications between current participants (Oklahoma State) or web site to highlight student activity (Carnegie Mellon)
- Research or “Scholar” designation on transcript (e.g., Colorado State, Oklahoma State) or recognition at graduation (Texas A & M)
- Presentation to State Legislature often in conjunction with other state institutions (e.g., Carnegie Mellon, Iowa State)
- At least 9 of 15 have an Undergraduate Research Journal (quite varied in purpose and function)
- University awards for students (e.g., North Carolina State) and faculty mentors (e.g., Auburn, Oregon State)
- Poster awardees at annual undergraduate exhibition become part of libraries’ digital collections (Penn State)

Measuring Outcomes:

- No consistent pattern in terms of tracking numbers/percentage of student participation
 - Colorado State appears to have the most systematic procedure in that Department Heads report annual participation to the Office for Undergraduate Research & Artistry
 - Some collect participation data for established/“formal” programs (e.g., Clemson, Oklahoma State, Carnegie Mellon)
- Some describe a specific assessment component (e.g., Michigan)

See Appendix A (Benchmark Institutions) & Appendix B (Additional Institutions) for further information including undergraduate research program URLs.

Assessment of Undergraduate Research and Creative Endeavors:

Assessment strategies were found to vary across the Environmental Scan (see previous section) as well as within a best-practice document published by the Council on Undergraduate Research entitled “Characteristics of Excellence in Undergraduate Research,” published in 2012 and available at: http://www.cur.org/assets/1/23/COEUR_final.pdf. Not only does this document provide considerable background on assessing quality of undergraduate research and associated programs, but it also provides commentary on best practices in institutional organization, investment, and recognition of undergraduate research.

From the CUR publication noted above, assessment of student learning outcomes is important; however, the UGRTE recognizes that exemplary undergraduate research and creative endeavors programs will go beyond this and collect assessment and program evaluation data that will take into consideration and include:

- a mechanism to obtain feedback from students and faculty on their satisfaction with logistical operations and program activities
- a sustainable method to collect data on the number of students and demographic variables of students who participate in undergraduate research, the level of their engagement, and outcomes resulting from their participation (presentations, off-campus conference attendance, publications)
- a sustainable method to collect data on the efforts of faculty mentors and outcomes resulting from their work with undergraduates (e.g., co-authored publications)
- a mechanism to track external funding that directly or indirectly supports the undergraduate research enterprise

- a mechanism and culture for students to self-report post-graduation educational and career plans that are related to their undergraduate research experiences
- resources (personnel, creation of databases and surveys, encouragement for students and faculty to respond to queries) to develop and sustain assessment and collection of benchmarking data.

We propose four broad goals focused on Assessment:

Goal 1: Develop a comprehensive Assessment plan for KSU Undergraduate Research.

Tactic: Identify in relation to undergraduate research/creative endeavor:

- a) Number of students involved.
- b) Area/programs/units supporting student endeavors.
- c) Faculty advisor/mentor.
- d) Dissemination types.
(e.g., performance; exhibition; paper read; poster presentation; conference session; peer-reviewed article; invited article; research award; patent)
- e) Dissemination levels.
(e.g., local, stated, regional, national, international)
- f) Qualities of student involvement.
(e.g., assisted with faculty research; self-created research/creative activity; mentored/non-mentored; credit-bearing; independently initiated)
- g) Demographics of students involved.
(e.g., gender; ethnic diversity; socio-economic level; first generation)

Information received through a required Undergraduate Research Participation Survey at the time of enrollment every semester.

Goal 2: Create an online database and interface for students, faculty, and staff.

Tactic: Connect survey data (see Goal 4), through which students will self-report additional information pertaining to their research/creative endeavor in the format of Curriculum Vitae. The additional content retrieved from this self-report mechanism includes:

- a) Title of research/creative endeavor.
- b) Abstract describing research/creative endeavor.
- c) Disciplinary area(s) into which project can be categorized.
- d) Date initiated and date completed.
- e) Collaborators associated with project.
- f) Supportive funding provided (*if any*).
- g) Uploaded or linked artifacts of student work.
- h) Other information imported from the survey includes: Faculty advisor/mentor; Area/program/unit supporting student endeavor; Dissemination type; Dissemination level; Quality of study involvement
- i) Materials and necessary resources provided/not provided by the university.

Qualities of this online mechanism include:

- Students can view/print individual accomplishments for use in a vitae.
- Printable certificate of accomplishment(s) of achievement.
- Ease of use by student/faculty.
- All submission content checked and confirmed by the mentors.
- Mechanism to sort/view student achievements attributed to faculty/mentor/adviser, department, college.
- Faculty can view/print accomplishments of their students for use in their vitae.

- All data sortable by category.
- Collection of artifacts documenting student research/creative endeavor.
- Could be used to identify student achievements for student awards; recognition for best practice of mentorship; levels of accomplishment; extent of dissemination; etc..
- Allows a mechanism for feedback and discussion enabling interaction between faculty/mentors/advisers involved in guiding undergraduate research/creative endeavor.
- Promotes an enrichment of campus culture that embraces undergraduate research/creative endeavor as a means of high-impact instructional practice tied to student learning outcome within and beyond programmatic goals.

Goal 3: Survey graduating seniors and recent alumni about their experiences.

Tactic: Include questions on the Senior Survey and 1st year, 4th year Alumni Surveys that identify student perception of the contribution of undergraduate research/creative experiences and possible ties to future achievements.

- Questions should focus on: a) involvement; b) contribution from mentors; c) how many semesters involved; d) contribution of the experience to success in their profession; e) perception if the experience contributed to academic success; f) did experience contribute to professional direction; g) types of dissemination achieved.

Sample questions should include whether the experience:

- helped me to better think and work independently and formulate my own ideas.
- helped me become more intrinsically motivated to learn.
- made me a more active learner.
- helped improve my skills in the analysis and interpretation of data/information.
- gave me tolerance for obstacles faced in the research/creative process.
- improved my understanding of how knowledge is constructed and how professionals work on real problems.
- improved my ability to integrate theory and practice.
- increased my self-confidence.
- increased my ability to work in a team.
- increased my potential to be successful in my profession.

Goal 4: Substantiate qualities of impact

- The database can become a mechanism useful for the new Associate Provost for Undergraduate Studies to identify the relationship between retention and involvement in various forms of undergraduate research/creative endeavor.
- Correlation of changes in GPA might be useful in assessing educational impact of student engagement with undergraduate research/creative endeavor.
- Develop a mechanism for faculty mentors to rate qualities of student achievement associated with the particular undergraduate research/creative endeavor through the use of a rating scale similar to the following (student achievement could be tracked over time).

- Rating scale could reflect the following divisions:

-

Unacceptable | Developing | Proficient | High Achieving

Definitions of "Unacceptable - developing - proficient - and high achieving" will be determined at the department level. Expectations for each step of the four-step metric are to be clarified by each department to determine if the student had met their criteria for their research/creative endeavor.

Promotion and Celebration of Undergraduate Research and Creative Endeavors:

Generally speaking, the UGRTF believes that promotion and celebration of undergraduate research should be recognized at the highest levels among university administrators, and undergraduate research and creative endeavors are philosophies and activities embraced by the larger university community of students, faculty, and staff. It begins with administrative support (financial and philosophical) that includes funding and/or some formal credit that support adjusted time-and-effort, which reinforces that undergraduate research supervision is valued by the institution. Research infrastructure also promotes undergraduate research through dedicated offices, space, and facilities as well as professional development (mentoring the mentor, preparing students for presentations, etc.). Promotion and Celebration also include appropriate dissemination of results that contribute to “new knowledge” in the discipline – presentations, publications, and other forms of recognition and sharing with the campus, community, and State.

Specific ideas emerging from the Environmental Scan, the CUR report, and personal experiences that were discussed for consideration included:

1. The need to provide financial support for undergraduates interested in conducting research. This may be particularly important for disciplines that do not have extensive outside sources of funding to support undergraduate researchers.
2. A possible funding mechanism could be to have students apply to do undergraduate research. They could be required to propose a project and write a brief proposal for their project. This would ensure that students really want to conduct research, rather than use the opportunity just to make money. It would also select the top students, ensuring high quality research.
3. The need for funds to allow undergraduate researchers to attend professional meetings. This is both a celebration of the research the students are working on, and a way to promote K-State
4. The value of having a course (0-credit possibly) in each department where departmental faculty could discuss their research and research opportunities for undergraduates, particularly incoming students.
5. An undergraduate research journal could be created with help from library personnel.
6. The need for end-of-year or start-of-year poster sessions/convocations as celebrations of student research. This could be done at the department level to avoid being too large/impersonal. Top posters from departmental sessions could be sent to university-wide events.
7. A start of the year event (as in 6) could be organized to highlight and celebrate research. This could include an Olympics-style opening ceremony, with a parade/fair highlighting different disciplines at a convocation. University administrators could address the students, and keynote speaker could be included.
8. A year-long seminar series could be organized geared towards freshman/soph. students that included student presentations, and presentations from faculty and visitors.
9. Workshops could be held related to research, graduate school application.
10. A reading club (like the KSBN common reading program) related to research could be developed.
11. A researcher’s hotline or workshop on how to manage stress could be created.
12. Faculty could be encouraged to invite student researchers to dinner over holidays where the researchers have chosen to conduct research rather than go home.
13. A Center for Undergraduate Research could be created to generate funds to support undergraduate research and highlight UG research results. This could be similar to Leadership Studies: building devoted to UG research. Could include a full-time administrator focused on UG research.
14. Faculty mentoring, training sessions could be created.
15. Additional awards for faculty/students to acknowledge outstanding UG research and mentorship.
16. To encourage faculty to be UG research mentors, faculty could be given teaching credit for mentoring a certain number of UG researchers – buy out of a different course.

17. Need a communications plan to publicize UG research – possibly involve Communications and Marketing.
18. End year with a week-long celebration including lectures, panel discussions, judging, banquet, could bring in K-12 students to present their work (i.e. science fair projects) that UG researchers could judge.

From this set of ideas, a number of Activities were proposed as collected in the Strategic Action Plan that follows.

Resources needed to support Undergraduate Research and Creative Endeavors:

Director – Center for UGRCE (1/2-time)	\$50,000
Assistant to the Director, event coordinator	\$40,000
Annual Celebration Activities	\$20,000
Financial Support for Students (\$1500 scholarships x 3000)	\$4.5M
Financial Support for Faculty (materials/supplies)	\$500,000
Travel support for students (meetings/presentations)	\$50,000
Council on Undergraduate Research Annual Membership	\$825 (per year)

K-State 2025 Undergraduate Research & Creative Endeavors (UGRCE) – Strategic Action Plan

Thematic Goal: Define, promote, enhance, assess, and celebrate undergraduate research at K-State.

Assumptions: ■ In order to become a top 50 public research university in today’s world, Vision 2025 expects that there will be an increased participation by undergraduates in expanded opportunities in research. ■ Under RSCAD in Vision 2025, we will be competitive among our peers in the percentage of undergraduates involved in research. ■ Successful integration of undergraduate education and meaningful research is standard practice. ■ Undergraduate research is a factor in improving retention and time to graduation. ■ There will be an increase in undergraduate contributions in the creation of scholarship through research.

Activities	Outcomes -- Impact		
	Short Term	Intermediate	Long Term
<p>What we plan to do...</p> <p><i>Undergraduate Students</i></p> <ol style="list-style-type: none"> 1. Match students with mentors and projects using a web database of opportunities and talents. 2. Web base e-portfolio/resumé linked with Career & Employment Services for each student 3. Provide financial support for students with fellowships/scholarships 4. Provide travel funds for students to attend conferences to present their work 5. Provide resources to support their research 6. Provide training for students – ethical conduct of research, how to generate problems, how to do research, effective/appropriate use of source material. 7. Create a 0-N credit hour course option to track or give credit for student research. 	<p>What we expect to happen in 1-5 years...</p> <p>A. Create a well-organized web site that that promotes RSCAD and connects students with mentors. Through the web site, develop a systematic tracking system for participation by students and faculty. E-portfolio program for tracking created.</p> <p>B. Develop and launch a fund-raising campaign.</p> <p>C. 50% of students present their work on/off campus.</p> <p>D. All students involved will be exposed to general and disciplinary training in research conduct.</p> <p>E. Through faculty senate and departments, create appropriate courses with variable credit (0-N credits) for UGRCE.</p> <p>F. Students engaged in UGRCE have a designation on their transcript</p>	<p>What we expect to happen in 6-10 years...</p> <p>A. Enhanced web presence that showcases student projects. Participation should increase by 25% from launch</p> <p>B. Expanded fund-raising for student scholarships and to support activities.</p> <p>C. 75% of students present their work in on/off campus venues</p> <p>E. Courses exist across campus that provide variable credit for involvement in RSCAD.</p> <p>F. UGRCE is recognized as an important component to faculty P&T</p>	<p>What we expect to happen in 11-15 years...</p> <p>A. Participation increases by another 25%.</p> <p>B. Funding for all students interested in UGRCE</p> <p>C. All students participate in presenting their work on/off campus</p> <p>F. A culture shift is seen where UGRCE is an expectation for all students and faculty</p>

Activities	Outcomes -- Impact		
	Short Term	Intermediate	Long Term
<p>Faculty</p> <p>8. Recognize undergraduate research mentoring as a key component to time-and-effort distribution and towards promotion & tenure.</p> <p>9. Provide faculty with professional development around undergraduate research (mentor-the-mentor) and how to incorporate research into teaching/classroom experiences.</p> <p>10. Provide financial support to facilitate projects with undergraduates</p> <p>Promote & Celebrate Research</p> <p>11. Create a Center for Undergraduate Research and Creative Endeavors (UGRCE)</p> <p>12. Recognize UGRCE on the transcript, at graduation, at different levels, and through awards for students and faculty</p> <p>13. Celebrate UGRCE at a university or college-wide convocation for students at the start of each year.</p> <p>14. Host a research and creativity symposium (campus wide, >1 days) in the spring that celebrates accomplishments with presentations, displays, shows, performances. (See NCUR example) Invite legislators to campus.</p> <p>15. Create/host an online UGRCE journal</p> <p>16. Coordinate with Communications and Marketing to generate news stories and releases about UGRCE.</p> <p>17. Hold a UGRCE display at the Capitol in Topeka with legislators.</p> <p>Infrastructure</p> <p>18. Create an Undergraduate Research Center/Institute with a director and staff to support and coordinate activities, develop assessments.</p> <p>19. Become a member of CUR to connect with practitioners</p> <p>20. Provide a physical space for hosting workshops, group/team work spaces, and general work areas.</p>	<p>G. Develop a plan to review P&T documents and recommend language that supports UGRCE. Utilize the Center for Teaching and Learning to develop mentoring the mentor programs and incorporating research in the classroom.</p> <p>H. Fund-raising plan developed and launched to promote faculty involvement</p> <p>I. Center with dedicated space and a director will be identified. Director reports to the new VP for Undergraduate Studies. Needs computers, poster printer, presentation training rooms.</p> <p>J. Design and delivery of a new online UGRCE Journal for KSU students. Peer review provided by students and faculty.</p> <p>K. Evaluate best practices for celebrating UGRCE at peers and NCUR to design campus celebrations/convocations.</p> <p>L. UGCRE will have a unique place on the KSU website. Highlights will be posted each week.</p> <p>M. Join CUR and attend conference, NCUR in FY13. Host an external review team to evaluate our current situation and potential. Help us design a Center for KSU.</p>	<p>G. A suite of mentoring and training programs exists</p> <p>H. Funding is available to faculty to support student projects/activities</p> <p>I. Space provided for students to learn and work together on projects, papers, and workshops.</p> <p>J. The electronic Journal is published each semester</p> <p>K. Colleges and KSU have celebrations including all forms of UGRCE.</p> <p>L. Link marketing/promoting of UGRCE to prospective student sites, career sites, academic sites.</p>	<p>H. Program to provide faculty with resources to support UGRCE is fully funded.</p> <p>J. All students participating in UGRCE are publishing in the electronic journal or in a professional journal within their discipline.</p> <p>K. KSU has its own UGRCE day at the Capitol in Topeka.</p>

Appendix A: Environmental Scan of Benchmark Institutions

	Infrastructure			
Benchmark Institutions Ordered by # of Top 50 Categories	Centralized or Decentralized	Space (location on campus and/or unit housed within)	Oversight (e.g., administrator or division with responsibility)	Sourcing (funding streams; could also include technical assistance)
North Carolina State http://www.ncsu.edu/undergrad-research/contact.php#	Centralized	Office of Undergraduate Research, established in 2003	Judy Day, Interim Director; Coordinates UG research activities, including Freshman Orientation, research day, REU, workshops, housing for summer research programs.	\$94,000 direct cost per year from state fund NSF, REU Support from each college
Iowa State http://www.undergradresearch.iastate.edu/	Decentralized	Honors Building (if there is a home)	Provost provides a few central resources and Honors coordinates a mentor workshop and UGR symposium annually; the rest is program-specific.	Some personnel investment at Provost level; most from federal grants (NSF, McNair, Work Study) with some foundation/endowment support
Colorado State http://tilt.colostate.edu/oura/	Centralized	Office for Undergraduate Research & Artistry (started 2009); Operates within Institute for Learning and Teaching; has administrative space and space for student activity	Director (Mark Brown) & Associate Director positions; 3 Coordinators (oversee formal programs); 2 GAs; 12 UG Mentors– close relationship with the Office of VP for Research & with Provost.	5 university supported positions (Director, Associate & 3 coordinators); 2 graduate students (grant funded); University also provides 2 floors for UG research (e.g., additional labs & core resources)
Oregon State http://oregonstate.edu/students/research/	Centralized (recently)	Housed within “undergraduate studies” office under the Provost	Just hired a director for undergraduate research (0.5 FTE) under the provost’s umbrella.	HHMI, NSF, NIH, DOD, State Department, internal/endowment funding.
Clemson Creative Inquiry: http://www.clemson.edu/academics/programs/creative-inquiry/ EUREKA! http://www.clemson.edu/cuhonors/eureka/index.html	Centralized	N/A	Coordination by Associate Dean of Undergraduate Studies with assistance from coordinators in each college.	Grants, Central Administration, Industry Partners
Oklahoma State http://scholardevelopment.okstate.edu/index.php?slab=undergraduate-research	Centralized	Office of Scholar Development & Recognition (343 Student Union) Expect change from “Recognition” to “Undergraduate Research” (combines scholar development with UG research); housed under Provost	Director - Bob Graalman (also has a Graduate Assistant) Program for scholar development has gradually assumed more responsibility for UG research.	Heavy emphasis on Foundation/Endowment gifts; current funds for: --60 Freshman Research Scholars --50 Wentz Program (\$4500 grants) --Nblack Scholars (\$8000 grants) Endowment goal - \$3,000,000
Kansas State http://www.k-state.edu/grad/suop/index.html	Decentralized	None	Different individual for each college	DSP – state fund; NSF, REU; NIH, K-INBRE; McNair Scholars Program Center for Basic Cancer Research; SUROP; KS NASA Space Grant Consortium
Auburn http://www.auburn.edu/undgres/index.html	Centralized	Office space in Provost’s Office; Director reports to Provost although VP for Research supports other research efforts of university	Director of Undergraduate Research (faculty member with split appointment)	Central Administration, Departmental Funds, Federal Grants, Foundation/Endowment Gifts, Industry Partners

	Program Components		
Benchmark Institutions	Special functions, Features, or Programs (e.g., summer workshops; honor's program)	Promotion or recognition activities	Dissemination (e.g., home page, forums, journal, brochure)
North Carolina State	Assisting with housing for summer program; coordinate welcome reception for research programs; intro to research ethic; class for presentation and research poster	W. Scott and Mary Dell Chilton Undergraduate Research Award for student Travel awards for undergraduate research students	Excellent home page, brochure at Freshman Orientation, Undergraduate Research Day
Iowa State	Mentoring workshop; all-university undergrad research symposium (>100 presenters); informational meeting for students about summer research programs; Undergrad Research Assistantship program.	Symposium; presentations at the State Capital	Symposium; presentations at State Capital, website
Colorado State	Honor's Program; External opportunities with industries; Numerous on-campus programs listed for different areas (e.g., chemistry summer research; Psychology; The Water Center).	Web site lists opportunities across campus; UG Research & Artistry Database (way to link students to specific faculty and projects) Research designation on transcript if criteria met	Symposium (660 UG this year to present – required for honor's students); UG Research Journal (accept submissions from any student/institution)
Oregon State	A series of workshops: "Research Skills for Undergraduates" - Some overlap with Honors college.	"Research Fellow" or "Arts Fellow" transcript notation for participating graduates; "Celebrating Undergraduate Excellence" poster session; Faculty Undergraduate Mentor of the Year; UG Library Research Award; UG ambassadors program	Journal: <i>The Catalyst</i> for science publishing; website, poster session, YouTube channel.
Clemson	Creative Inquiry Teams – pairs students with faculty mentors EUREKA! – summer program for incoming freshmen honors students	Faculty Mentoring Award	Website, Poster Forum
Oklahoma State	Freshman Research Scholars- 60 students given stipends to take an orientation course and conduct research; Wentz Research – funds 50 students to work with faculty member for a year (\$4,500); Niblack Research Scholars – funds student and also provides research assistantship to faculty member over summer months	Research Scholar Designation on transcript-faculty determined (tied to presentation & publications); UG Research Network-faculty post opportunities to connect with students; Blog – helps connects students within program	Undergraduate research journal – faculty reviewed (to provide experience with publication process – not required to submit); Wentz program includes project presentation (poster display)
Kansas State	Undergraduate Research Forum; honor's program; NSF-REU; NIH-KINBRE summer program; SUROP	University Distinguished Faculty and Student Awards Web site includes descriptions of programs	Post previous SUROP participants
Auburn	Undergraduate Research Fellowship (student and faculty mentor apply for support as a pair); College specific competitive research fellowships College specific summer research programs	Provost's Award For Faculty Excellence in Fostering Undergraduate Research	Web page, undergraduate forums to present research, open access journal of undergraduate research to publish research and results

Benchmark Institutions	Mission Statement & Outcomes		Notable Aspects
	Statement of Purpose or Learning Outcomes	Data about participation	Impressive elements
North Carolina State	The Office of Undergraduate Research at North Carolina State University supports and promotes excellent undergraduate opportunities in discovery-, inquiry- and creativity-based scholarship through mentored research experiences with NC State faculty and other national and international scholars and professionals.	485 poster presentations at 2012 Undergraduate Research Day	Financial support from the University (yearly budget for the program)
Iowa State	Engaging in research lets you...connect theory to practice; work as part of a team; develop valued skills and experience; clarify your interest & goals; see a different side of the university; sow the seeds of future study and careers; work within, between, and beyond disciplines; develop mentoring relationships with faculty, staff & graduate students; participate in the discovery of knowledge.	Only data publicly available is the >100 participating in symposium annually.	
Colorado State	"Our primary mission is to serve as an interface among students, faculty, and industry to ensure that all undergraduates at CSU have access to opportunities to explore their interests in research, artistry, and other forms of creative work within their respective disciplines."	Just over 4,000 (2011) compared to 1200 (2009); Department heads report annual data to OURA	University commitment; efficient tracking of participation; electronic database to connect student/faculty
Oregon State	"Participation in undergraduate research benefits students educationally, professionally, and personally..."	Very new university-wide initiative.	Marketing; different approaches to encourage participation
Clemson	Creative Inquiry Program Mission: This initiative gives every student a creative inquiry experience. This interactive environment engages the faculty, student body and community in discovery, enriching the lives of each constituency. <i>Approved 4/11/06</i> EUREKA! Program brings about 33 incoming freshman students, who have been accepted into the Calhoun Honors College, to Clemson for a five-week period during which they participate in research projects or other scholarly activities.	Creative Inquiry 2011 – <ul style="list-style-type: none"> • 1,894 students • 288 Teams in 167 Active Projects EUREKA! 33 students per year	Utilizes graduate students as mentors
Oklahoma State	"At OSU, we believe research is an invaluable component to any undergraduate student experience. OSU leads the way in supporting undergraduate research in all fields of study by offering a variety of research programs and opportunities starting as early as the freshman year. Because research enhances overall learning, these programs and opportunities help students take advantage of everything a comprehensive research university like OSU has to offer."	Tracks "formal" programs (around 200); project 300-500 other types. Estimate 95% retention of freshman who participate in research.	Endowments; merges UG research and UG who compete for scholarly awards (e.g., Truman, Udall); Blog for participants; Electronic postings to connect students with faculty
Kansas State	None	2010-nearly 200 UG students participated in a funded formal research program, and ~1,500 were involved in non-funded related research projects.	
Auburn	The Office of Undergraduate Research at Auburn University (OUR AU) promotes opportunities for Auburn undergraduates to engage in mentored research and creative scholarship. As future leaders and community-involved citizens, Auburn students must be equipped to face difficult social, political and environmental challenges. To be successful, our students must be able to apply creative solutions to complicated social issues, understand multi-faceted physical processes, and communicate effectively. We believe that undergraduate research and scholarly activity is a way to develop these important skills and enrich the Auburn educational experience.	N/A	

Appendix B

Environmental Scan: Sampling of Additional Institutions

	Infrastructure			
University (& URL to undergraduate research)	Centralized or Decentralized	Space (location on campus and/or unit housed within)	Oversight (e.g., administrator or division with responsibility)	Sourcing (funding streams; could also include technical assistance)
Carnegie Mellon http://www.cmu.edu/uro/	Centralized	Administrative Office 531 Warner Hall 5000 Forbes Ave. Pittsburgh, PA 15213	Stephanie Wallach, Asst. Vice Provost for Education; Program started 1989 – builds student/faculty connections across campus	2 positions – UG research & national scholars program; Corporate sponsors, endowed funds, & Provost office fund UG research projects
Florida State http://our.fsu.edu/	Centralized	Office of Undergraduate Research and Creative Endeavors; Housed in Division of Undergraduate Studies office complex	Director and Associate Director of Office of Undergraduate Research with split faculty appointments; Oversight by Dean of Undergraduate Studies (who serves as the academic dean for most freshmen and sophomores until they are admitted to an upper-division major.)	Fellowships/awards/scholarships available to students to support research endeavors; funding from grants, private foundations, and endowments
Michigan http://orsp.umich.edu/funding/2012/undergrad.html http://orsp.umich.edu/funding/students.html	Decentralized	N/A	Research and Sponsored Programs provides overall info site. Major Undergraduate Research Opportunity Program (UROP) has been running for >25 years with its own director and staff.	NSF, individual departments, endowment
New Hampshire http://unh.edu/ http://www.unh.edu/undergrad-research/ (Hamel Center)	Decentralized	Hamel Center (209 Hood House) Office of Undergraduate Education Graduate School	Senior vice provost for engagement and academic outreach. (The activities of the annual Undergraduate Research Symposium are coordinated through this office.) Directors for individual programs	Hamel Center provides resources & financial support (100% donor gifts); Univ. admin, the UNH Parents Assoc.; state and federal funding, and http://unh.edu/undergrad-research/benefactorsendowments ; limited, non-institutionalized university funding for other programs; federal REU's and grants.
North Carolina A & T http://www.ncat.edu/research/students/index.html	Centralized	Recently established office – no physical space	Peggy Bolick, Interim Director mrbolick@ncat.edu No release time for position at present	No current budget or support staff
Penn State University https://undergradresearch.psu.edu/	Decentralized (Centralized information site with links to opportunities)	No one main location	Office of Undergraduate Education http://www.psu.edu/oue/ Graduate College for (1) McNair Scholars and (2) SROP run in cooperation with the Big 10 Committee on Institutional Cooperation (CIC)	Office of Vice President and Dean of Undergraduate education. Faculty grants. Discovery grants to students to fund summer research from Office of Undergraduate Education.
Texas A & M http://honors.tamu.edu/Index.html	Centralized	Merged with Honors program (2010); Honors and UG Research (Henderson Hall) – includes National Fellowships	Executive Director, Dr. Sumana Datta	9 university supported positions (3 directors; 2 advisors; 4 staff)
Tuskegee	Decentralized	Department - College specific	Department - College specific	Dependent on grants for specific areas

	Program Components		
	Special functions, Features, or Programs (e.g., summer workshops; honor's program)	Promotion or recognition activities	Dissemination (e.g., home page, forums, journal, brochure)
Carnegie Mellon	Small UG research grants to help cover expenses; summer fellowships; fund students who present at conferences; grants to help cover research conducted as part of study abroad experience; fund individual & group projects – Proposals (offer writing workshops) attached to all funding (competitive process)	URO highlights – links for current students (highlights their activity)	Meeting of the Minds (campus-wide annual symposium) – about 450 presentation across disciplines; <i>Thought</i> (UG Research Journal); 2 students selected to present research at legislature
Florida State	Global Scholars Program (Summer research projects in developing countries) "Undergraduate Research Opportunity Program" – new in Fall 2012; connects faculty and students for research opportunities	N/A	Undergraduate research journal; Annual undergraduate research symposium; Participation in regional and national conferences
Michigan	UR forum Undergraduate Research Opportunity Program (UROP); summer research	N/A	UR journal (http://umuri.org/)
New Hampshire	UNH academic programs are grounded in inquiry-based learning whether in humanities or life sciences, engineering or the physical sciences. Each student will have a senior thesis or project to demonstrate competencies and mastery.	Annual Undergraduate Research Conference: two-week long symposium. Over 1,000 UNH undergraduate students, from all academic disciplines, will present at the URC. The presentations showcase the results of their scholarly, engaged, and creative research in over 20 professional and artistic venues at both campuses http://www.unh.edu/urc/	Undergraduate Research Conference <i>Inquiry</i> journal is the online, multi-disciplinary undergraduate research journal of the University of New Hampshire. It is published annually in April at www.unh.edu/inquiryjournal
North Carolina A & T	Very informal activities at present – interim director created bibliography to help students access resources for UG research (low-cost strategies)	None at present	Undergraduate Research Symposium (first held 2010); Undergraduate Research Day (April 2011)
Penn State University	Undergraduates who are presenting the results of their research or creative work at national or regional professional conferences may request financial support to defray the costs of attendance at the conference. 1/3 university, 1/3 college, 1/3 department.	Annual Undergraduate Exhibition communicates and celebrates the participation of undergraduate students from across the University in research and creative endeavors; poster presentations to showcase their work to a general audience.	In cooperation with the University Libraries, poster awardees in all print categories will have the opportunity to submit their winning poster PDFs to become part of the Libraries' Digital Collections
Texas A & M	Student Research Week; NSF-REU; workshops for students on obtaining summer research opportunities; workshops for faculty on mentoring undergraduate researchers ; Hughes Medical Institute Education grant	Recognition at graduation	Website; <i>Explorations: the Texas A&M Undergraduate Journal</i>
Tuskegee	Web site highlights Office of UG for STEM programs (NSF funded) but it doesn't appear to be current based on follow-up calls– any activities are discipline specific	N/A	N/A

	Mission Statement & Outcomes		Notable Aspects
	Statement of Purpose or Learning Outcomes	Data about participation	Impressive elements
Carnegie Mellon	"Research, scholarly, or artistic activities that lead to the production of new knowledge; to increased problem solving capabilities, including design and analysis; to original critical or historical theory and interpretation; or to the production of art or artistic performance."	Database – linked to students who apply (write proposals) for funding; Do not have a systematic way to track student research that is not funded	Proposal process; Funding to present at conferences; possibility of study abroad research; http://www.cmu.edu/uro/SURF/index.html
Florida State	--Administering FSU undergraduate research awards, including the URCAA (co-sponsored by the Office of National Fellowships) and MRCE awards, and the ACC research fellowships; --Sponsoring or co-sponsoring opportunities for undergraduates to present the results of their research projects, including two annual research symposia and the FSU Undergraduate Research Journal; --Providing advising and resources to undergraduates seeking research experiences; --Assisting faculty in engaging with undergraduates on research projects; and --Serving as a central source of information for students, faculty, advisors, and staff on matters related to undergraduate research.	N/A	Student Council for Undergraduate Research and Creativity: "The Student Council for Undergraduate Research and Creativity (SCURC) is committed to promoting awareness about undergraduate research for students at Florida State University. Through generating awareness we hope to increase the number of students engaged in research..."
Michigan	The Undergraduate Research Opportunity Program (UROP) creates research partnerships between first and second year students, and faculty, research scientist, and staff from across the University of Michigan community.	UROP began in 1989 with 14 student/faculty partnerships, today, approximately 1100 students and over 700 faculty researchers are engaged in research partnerships	Strong assessment component of UROP: http://www.lsa.umich.edu/urop/aboutus/evaluationassessment
New Hampshire	Subsumed within statements about undergraduate education. An education at the University of New Hampshire is an adventure in discovery. Whether our academic programs are founded in the humanities or life sciences, engineering or the physical sciences, they are grounded in inquiry-based learning.	Not centralized	One of the first institutions to focus on undergraduate research; 25 th anniversary of Hamel Center this year.
North Carolina A & T	The Office of Undergraduate Research works to: Improve the intellectual climate of the university by increasing the number of students who are engaged and supported in undergraduate research; Improve operational efficiencies by serving as the nucleus for ongoing UG research activities both on campus and those available through external partnerships; Expand the university's resources through synergistic activities that leverage resources from various funding sources, and centralized coordination of research activities; Improve marketing efforts by positioning N.C. A&T as a leader in UG research	No system for tracking	--
Penn State University	Priorities for Undergraduate Education include: Expanding learning opportunities that facilitate application and integration of academic knowledge including undergraduate research and public scholarship.	Not centralized	Travel funds for presentations: Office of undergraduate education matched with college and departmental funds.
Texas A & M	Honors and Undergraduate Research promotes academic excellence, holistic growth, and personal development through increased access to intellectual challenge and personal enrichment that would not otherwise exist.	In the process of generating database	Required 2 semester research experience; register for 3 credit hours per semester; provide \$300/student for travel or supplies and \$500/student for research team
Tuskegee	N/A	N/A	--