



TEXAS TECH UNIVERSITY

**Undergraduate Research Task Force
Report and Recommendations**

December 2011

Dedication



Dr. Sarah Kulkofsky

The work of the Undergraduate Research Task Force is dedicated to the late Dr. Sarah Kulkofsky. She was to have been a member of the task force, but passed away before the first meeting.

An assistant professor in the Department of Human Development and Family Studies, Dr. Kulkofsky made an impression on her colleagues and her students. She was honored with the Alumni Association New Faculty Award. The award was based on student evaluations, innovative teaching activities, initiation of research/creative activities, and interaction with students. Dr. Kulkofsky brought passion to her teaching and demonstrated an enthusiasm for sharing her knowledge with undergraduate researchers, exemplifying the best in undergraduate mentorship. Many undergraduates benefitted greatly from the active learning experiences she offered. Brittany Luker, a member of the Undergraduate Research Task Force, worked with Dr. Kulkofsky in her research group and represented her on the task force. Dr. Kulkofsky will be missed, but her passion for undergraduate research will live on.



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Introduction

The Undergraduate Research Task Force was established by President Guy Bailey and Provost Bob Smith in January 2011 in an effort to enhance undergraduate research at Texas Tech University (TTU).

While it is evident there is significant undergraduate research at Texas Tech, it also is evident that there are many disparate units and efforts that drive undergraduate research opportunities. Three major groups are the primary vehicles for organized undergraduate research: the Center for Undergraduate Research (CUR), the Howard Hughes Medical Institute Undergraduate Science Education Program at the Center for the Integration of Science Education and Research (HHMI/CISER) and the Honors College. However, there are many more undergraduate students and faculty participating in a variety of collaborative research, scholarship and creative activities at Texas Tech.

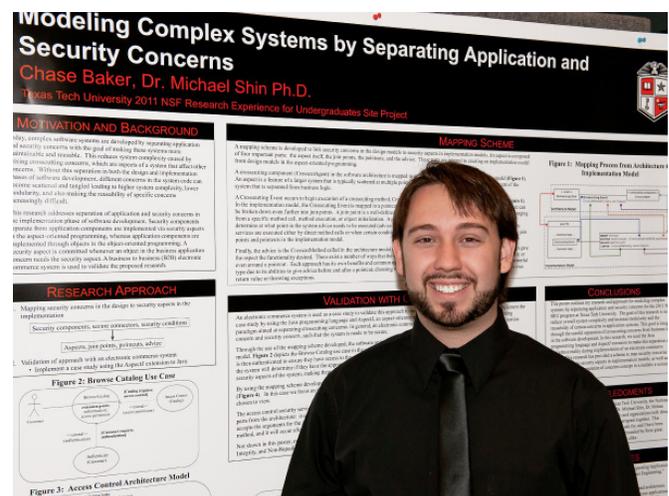
The Task Force, chaired by Vice President for Research Dr. Taylor Eighmy, was charged specifically with the following six matters:

- Consider national best practices for promoting and supporting undergraduate research, scholarship and independent creative efforts; particularly against the Boyer Commission recommendations.
- Catalog and describe the sometimes disparate units and efforts that drive undergraduate research at Texas Tech.
- Given best practices and our existing areas of strength, provide a blueprint for most effectively improving undergraduate research opportunities and experiences—recognizing the necessary interfaces of centralized versus decentralized units and the important roles that the university’s colleges and departments will play in all future efforts.
- Describe specific targeted efforts that will help us meet the goals articulated in

Texas Tech’s Making it Possible... 2010-2020 Strategic Plan and in TTU’s 2010 Strategic Plan for Research.

- Recommend methods for maximizing appropriate financial support for the preferred undergraduate research opportunities that are brought forward.
- Suggest ways to engage both faculty members and students in our jointly held goals.

President Bailey and Provost Smith have defined an active learning triad of undergraduate research, study abroad opportunities, and service learning and internships as the key elements that form the basis for experiential learning and enriched discovery (Bailey and Smith, 2011). In a spring 2011 All Things Texas Tech article, they wrote of the importance of developing research expertise and the benefits to both the students and the faculty members who participate in undergraduate research. The article also discusses how Texas Tech can set itself apart from other universities by becoming an example of discovery-based undergraduate research and learning.



Charles Baker is a senior computer science major. He became interested in undergraduate research through his participation in the National Science Foundation Research Experiences for Undergraduate Site Program held in the summer of 2011 at Texas Tech.

The Undergraduate Research Task Force's work also is a key strategy in Making it possible... 2010-2020 Strategic Plan. The university's commitment to undergraduate research is noted in its 2010 Strategic Plan for Research prepared for the Texas Higher Education Coordinating Board as follows:

One outcome of our strategic plan will be the strengthening of our undergraduate research programs and profiles...Our focus on undergraduate research spans the spectrum of scholarship at Texas Tech—from the performing arts, humanities, and social sciences to the science, technology, engineering and mathematics (STEM) disciplines.

The Task Force began its deliberations by reviewing the Boyer Commission's 1998 seminal report on the need for undergraduate research at major research universities. The report states:

"Research universities must be willing to approach the issue of undergraduate education free from the blinders of past practice, to ask basic questions and be prepared for answers that require radical reformation of methods of operation. Given the scale of the institutions and the

multitude of interests touched, change will be anything but easy. The commitment to dramatic change, not half measures, must be made now, and action must respond to the urgency of the issue."

It was with this background that the Undergraduate Research Task Force began deliberations in March 2011.



Heather Darnell, shown here on a study abroad trip, is a double major in music and classics. She was abroad researching the lullabies of Southern Italy. She received funding for her research through the Center for Undergraduate Research.

The Task Force

The Task Force, made up of 32 faculty, staff and students from across disciplines,(Appendix A) met seven times during 2011, beginning in March.

The Task Force spent considerable time examining the differing needs and cultures of academic disciplines, acknowledging that undergraduate research in the sciences is vastly

different from that in the humanities, which is different from the arts and from the social sciences. As a result, two working groups were established. One gathered and analyzed external best practices; the other conducted an internal survey to determine not only the scope of undergraduate research on campus, but also the benefits and obstacles from a faculty point of view.

Internal TTU/TTUHSC Undergraduate Research Survey

The internal working group, chaired by Professor Dominick Casadonte, Department of Chemistry and Biochemistry, devised a survey that was sent to all TTU faculty members and those faculty members identified at the Texas Tech University Health Sciences Center who do or who have had undergraduates in their laboratories. The survey was devised by the working group with input from the full task force. Dr. Dennis Patterson, chairman of the Department of Political Science, analyzed the data.

The survey, with assistance from the Office of Information Technology, was deployed electronically in May and received 170 responses (Appendix B). The survey indicates that faculty participation in undergraduate research is high, with 60% reporting presently having undergraduate researchers and more than 80% reporting having undergraduate researchers in the past five years.

Dr. Patterson notes that the findings are most likely the result of at least some selection bias—faculty members who did not participate in the survey are far more likely not to have undergraduate researchers than those who did participate.

Other findings of note:

- 62% of respondents were tenured
- 38% were untenured, either tenure-track assistant professors or instructors
- 50% of faculty had research where undergraduates published in external sources

External Best Practices

The external working group was chaired by Professor Roman Taraban, Department of Psychology. His group looked at multiple universities, ultimately producing a document titled “Advancing the Culture of Undergraduate Research at TTU” (Appendix C).

All members of the task force were asked to look at research university websites and recommend several that they believed demonstrated strong undergraduate research activity. Those suggestions were discussed and a smaller list of universities was compiled. The external working group then divided the list and examined the websites to answer seven questions:

- How does the university promote undergraduate research?

- How are students motivated to participate?
- Is there a sense that freshman, sophomore, and average GPA students are eligible to participate?
- How are different university disciplines represented?
- Does a sense of the “scholarship of discovery” come through on the Web pages?
- Are students afforded some preparation for getting into research – e.g. tips on how to interview with a potential mentor?
- Is there a mechanism on the website for contacting faculty mentors?

Texas Tech's website was examined along with the following universities:

Baylor University http://www.baylor.edu/political_science/index.php?id=71655

University of Colorado <http://www.colorado.edu/UROP/>

Iowa State University <http://www.undergradresearch.iastate.edu/researchopportunities.html>

University of Kansas <http://www2.ku.edu/~selfpro/research.shtml>

Kansas State University <http://www.k-state.edu/grad/gshome/undergradopp.htm>

University of Missouri <http://undergradresearch.missouri.edu/>

University of Nebraska http://www.unl.edu/ous/undergraduate_research/research.shtml

University of Oklahoma <http://www.ou.edu/undergraduate-research#3>

Oklahoma State University <http://scholardevelopment.okstate.edu/index.php?slab=undergraduate-research>

University of Texas <http://cns.utexas.edu/research/undergraduate-opportunities/>

Texas A&M University http://honors.tamu.edu/Research/Scholars&Fellows_Application.html

Duke <http://undergraduateresearch.duke.edu/Stanford> <http://www.stanford.edu/dept/undergrad/cgi-bin/drupal/research>

University of Georgia <http://www.curo.uga.edu/>

University of Michigan <http://www.lsa.umich.edu/urop/>

University of New Hampshire <http://www.unh.edu/undergrad-research/programs.html>

University of Delaware <http://urp.udel.edu/>

The key recommendations from the external working group to enhance undergraduate research at Texas Tech include:

- Heavy promotion of the scholarship of discovery

- Develop undergraduate research Web pages for each department
- Develop research opportunities over a broad range of disciplines
- Develop and implement mechanisms to reward and motivate students
- Develop and promote freshman and sophomore participation
- Develop creative funding opportunities for faculty
- Develop and support an undergraduate research publication
- Develop a student research project website
- Provide grants for student travel for research presentations
- Develop resources to help students prepare for undergraduate research including responsible research seminars and information on how to find a mentor



Lesley Abraham is a cell and molecular biology major. A Texas Tech Howard Hughes Medical Institute Scholar, Abraham is working in the genetics laboratory of Brandt Schneider at the Texas Tech University Health Sciences Center.

Previous Undergraduate Research Committees

The task force also examined an undergraduate research survey and recommendations (Appendix D) by Dr. John Burns who was then associate vice president for undergraduate research in the division of the Vice President for Research, Graduate Studies and Technology Transfer. Dr. Burns also is a former provost. The survey was sent in September 2002 to all department chairs and area coordinators. Dr. Burns writes in his report that the survey was a “first step in evaluating the extent of Texas Tech’s commitment to undergraduate research in terms of financial support, faculty time, and student participation.” Twenty-five of 42 academic units responded to the survey.

The results from Dr. Burns’ report touched on a key issue raised by the current task force: how undergraduate research is considered in tenure and promotion. The 2002 results showed:

- 52% of reporting areas consider participation in undergraduate research for tenure and promotion
- 64% consider faculty participation in determining merit salary increases

The internal survey conducted in 2011 did not address these elements, but focused only on faculty participation.

The 2002 survey pointed to several obstacles and challenges to expansion of undergraduate research, some that surfaced in the 2011 survey. They include:

- Funding to support student stipends and supplies
- Faculty release time
- Faculty rewards (credit for directing students in terms of tenure, promotion and merit pay increases)
- The need for the university to publicize the importance of an undergraduate research experience
- The need for students to be better informed about the value of an

inquiry-based opportunity in their discipline

- The need for faculty to be encouraged by the president, provost and deans to incorporate students into their research endeavors

The 2002 report recommendations were:

- Make undergraduate research part of the university’s strategic plan and the strategic plan for each academic area
- Place an emphasis on increasing endowment funds so that more students can be offered research stipends
- Effectively communicate the benefits of undergraduate research to our faculty and students
- Call attention to undergraduate research opportunities in all official university publications
- Encourage academic units to reward faculty participation in undergraduate research when considering tenure, promotion and merit pay increases
- Institute a new award recognizing a faculty member’s outstanding contributions to undergraduate research
- Publish an undergraduate research journal
- Expand Research Days to include all academic disciplines

In September 2002, Dr. Burns also established an accounting procedure whereby the total number of student enrollments in undergraduate research classes could be tracked. The Office of Institutional Research and Information Management was programmed to provide official enrollment data each term for the 91 listed undergraduate research courses. The office’s report showed that 888 students were enrolled in undergraduate research courses in fall 2002 compared to 848 in the fall 1991 semester. From these data and others,

Dr. Burns concluded that Texas Tech University's involvement in undergraduate research in terms of funding, faculty time and the number of students involved (approximately 10%) was impressive.

In 2006, the Provost Office established a committee to look at the state of undergraduate research on campus. It met into 2008. While no

formal survey or recommendations were forthcoming from the committee, some email correspondence between committee members remains.

In 2008, the Center for Undergraduate Research was established under the Office of the Provost.

Recommendations

It is clear that Texas Tech embraces the idea of undergraduate research and has made periodic efforts to improve and enhance its efforts. The Center for Undergraduate Research primarily facilitates co-curricular undergraduate research opportunities, and also serves as an ad hoc administrative unit coordinating undergraduate research initiatives on campus. The center provides central support, staff, and student resources to enhance undergraduate research participation. A lack of centralized resources hampers the university's ability to know exactly how much undergraduate research, scholarship and creative effort takes place on the campus.

The 2011 Undergraduate Task Force acknowledges that many of the same issues identified in 2002 remain today and agrees with Dr. Burns' assessment that the issues must be addressed for the university to achieve the goal set by President Bailey and Provost Smith to provide all students with an opportunity to participate in research, scholarship or creative endeavor.

The Task Force also believes that much has been accomplished since the 2002 study.

- Undergraduate research is a strategy under Strategic Priority 3 in Making it possible...
- The establishment of the Center for Undergraduate Research and its close working relationship with HHMI/CISER and the Honors College has provided students with more

undergraduate research opportunities.

- The Research Days event has been expanded to a weeklong event.
- The President and Provost have made it known that undergraduate research, study abroad and service learning and internship opportunities are the key components to their active learning goals. met into 2008.

The Task Force also acknowledges that many of the same challenges and concerns remain from the 2002 study. To address those concerns and to meet the goals of the university, the 2011 Undergraduate Research Task Force presents recommendations in five categories for consideration by the President and Provost.

Administrative

- **Organizational Structure** – The provost should identify the best organizational structure for the coordination of undergraduate research activities. Current undergraduate research programs such as the Center for Undergraduate Research, HHMI/CISER and the Honors College would continue to function under their current structure. Information and undergraduate research opportunities should also be available through a central structure.
- **Student Funding** – Establish permanent funding to support undergraduate

researchers, including scholarships and travel funding.

- Faculty Funding – Establish permanent funding to support faculty through supply purchase, etc. to encourage undergraduate research.
- Promotion and Tenure – Criteria should be developed regarding how undergraduate research in general and undergraduate research publications specifically affect a faculty's tenure and promotion opportunities.
- R Course Number Designation – An "R" designation on all undergraduate research courses should be developed. A similar process was used to designate service learning courses. The model used for establishing the "S" designation and rolling out the program to faculty and students should be examined to see if it will work for the "R" designation.
- Program Integration – Establish co-curricular academic and experiential opportunities to increase cultural undergraduate research opportunities, such as integrating existing and new programs from TTU Study Abroad, the International Cultural Center, and the Cross Cultural Academic Achievement Center, across the disciplines.

Visibility

- Reach Current Students – Establish mechanisms to better inform all students, especially freshman, sophomore and transfer students after they arrive on campus.
- Reach Potential Students – Undergraduate research should be included in the marketing materials of the Office of Undergraduate Admissions targeting potential freshman and transfer students.
- Departmental Efforts – Encourage every baccalaureate-granting unit to develop multimedia-rich Web pages detailing the unit's undergraduate research opportunities.
- Undergraduate Research Publication – Establish an undergraduate research publication. Format and publication schedule should be determined by an

advisory committee made up of faculty, staff and students participating in undergraduate research.

- Increase Awareness – Adapt sections of the Freshman Seminar (Interdisciplinary Studies 1100: Tech Transitions) to emphasize undergraduate research.
- Red Raider Orientation – Undergraduate research should be spotlighted in presentations to students and parents at Red Raider Orientation.

Faculty

- Faculty Resources – Develop faculty resources, including information on how to become a mentor, what to expect from students, how to provide an undergraduate research opportunity, and how to find funding to support an undergraduate research opportunities.
- Mentor Program – Establish a mentor program pairing faculty interested in participating in undergraduate research with faculty who currently participate in undergraduate research.
- Recognition – Develop a means to recognize faculty participating in undergraduate research. Examples include: financial awards or a new president's award to be presented at the spring Faculty Awards Convocation.
- New Faculty Information – Establish a greater emphasis on undergraduate research at new faculty orientation.
- Publication Opportunities – Develop a list of undergraduate research publication opportunities and make it available to faculty mentors and students

Students

- Student Resources – Develop student resources, including information on how to find undergraduate research opportunities, what to expect from a faculty mentor, and how to interview with a mentor.
- Student Training – Develop seminars on research ethics and responsible research; research skills; and others in areas such as applying to graduate school.

- Student recognition – Develop official recognition for students participating in undergraduate research. Examples include a designation on transcripts; a medallion to wear at commencement after a specific level of work is achieved; designate student researchers as assistant, associate and full rank based on level and quality of undergraduate research work completed.

Assessment

- Identify courses used for undergraduate research activities and establish enrollment trends over the past five to 10 years using information from Institutional Research.
- Establish yearly enrollment growth goals and measure growth in identified undergraduate research courses.
- Add a section to Digital Measures allowing faculty to report undergraduate research activities.

Conclusion

The Boyer Commission and others stress that the world demands that undergraduate students possess a discovery-based education. The Commission also called on universities to look at undergraduate research without concern for the past.

Texas Tech has a long history of undergraduate research and of efforts to enhance opportunities for students in this area. The university is known for the quality education it provides and the excellent and capable students it puts into the workforce every year. Participation in undergraduate research will enhance a student's educational experience.

Texas Tech is undergoing a period of change as it reaches National Research University status in Texas and begins its journey toward achieving Association of American University-like qualities.

If the goals of the president and provost around active learning are achieved, thousands more students will be seeking undergraduate research, scholarship and creative opportunities. It is vital that serious campus-wide discussions commence about the role of undergraduate research in every discipline and how those efforts will be funded and

supported. The 2011 Undergraduate Research Task Force hopes this report and its recommendations will provide a framework for conversation and change as the university seeks to reinvent itself as a major national research university by 2020.



Brandon Gross is a senior zoology major and part of the Texas Tech Howard Hughes Medical Institute Undergraduate Science Program. His research interests include Morelet's and American crocodiles.

Appendix A

Undergraduate Research Task Force Members

Taylor Eighmy, Chair	Vice President for Research	
Bob Baker	Horn Professor	Biological Sciences
Kazuko Behrens	Assistant Professor	Human Development and Family Studies
Joaquin Borrego	Associate Professor	Psychology
Cristina Bradatan	Assistant Professor	Sociology
Mindy Brashears	Professor	Animal and Food Science
Dom Casadonte	Professor	Chemistry and Biochemistry
Thomas Cimarusti	Assistant Professor	Music
Tina Delahunty	Assistant Professor	Geography
Lou Densmore	Professor and Chair	Biological Sciences
Jeannie Diaz	Director	Center for Undergraduate Research (CUR)
Mary Diaz	Associate Vice President of External Relations and Strategic Initiatives	President's Office
Steve Fritz	Interim Dean	Honors College
Micah Green	Assistant Professor	Chemical Engineering
Sybil Hart	Professor	Human Development and Family Studies
Ann Hawkins	Associate Professor	English
Julie Isom	Associate Program Director of Administration	Center for the Integration of Science Education & Research (CISER)
Jennifer Moore-Kucera	Assistant Professor	Plant and Soil Sciences
Audra Morse	Associate Professor	Civil Engineering
Juan Munoz	Vice President for Institutional Diversity, Equity, and Community Engagement and Vice Provost for Undergraduate Education	
Michelle Pantoya	Professor	Mechanical Engineering
Valerie Paton	Vice Provost for Planning and Assessment	Office of the Provost
Dennis Patterson	Associate Professor and Chair	Political Science
Rich Rice	Associate Professor	English
Michael San Francisco	Associate Vice President for Research and Professor of Biological Sciences	
Sindee Simon	Horn Professor	Chemical Engineering
Roman Taraban	Professor and Associate Department Chair	Psychology
Susan Urban	Professor	Computer Science
Mark Webb	Associate Professor	Philosophy
Brittany Luker	Representing Dr. Sarah Kulkofsky	Human Development and Family Studies
Lesley Abraham	Student	Honors College
Aren Dobbs	Student	Honors College
Jannette Dufour	Assistant Professor, Cell Biology and Biochemistry	TTU Health Sciences Center

Appendix B

Undergraduate Research Task Force Survey Report

Results from the on-line survey of faculty participation in undergraduate research are presented in the following tables (N=170). The data in Table 1 provide a basic mapping of faculty participation rates in undergraduate research, both currently and in the last five years. Survey results showed that participation rates are rather high overall in that over 60% reported having undergraduate researchers presently and over 80% in the past five years. [This is a positive outcome, but it is most likely the result of at least some selection bias—faculty members who did not participate in the survey are far more likely not to have undergraduate researchers than those who did participate.]

Of faculty completing the survey, 62% were tenured while 38% were untenured, either tenure-track Assistant professors or instructors. As Table 1 also indicates, what is interesting is that, currently, untenured faculty reported participating in undergraduate research at higher rates than their tenured counterparts. In the last five years, however, tenured faculty participated at higher rates.

The data in Tables 2 and 3 examine participation rates among faculty, currently and for the last five years, broken down by college. The middle columns of Tables 3 and 4 indicate faculty participation rates across colleges. Currently faculty in the College of Arts and Sciences lead with just over 60% reporting participation in undergraduate research. Engineering faculty made up just less than a quarter of faculty reporting that they are currently participating in undergraduate research. What data in these two tables also indicate is how participation rates have changed in the last five years. Both A&S and Engineering faculty participation rates experienced increases over the last five years while faculty in all other colleges either remained at the same level or declined slightly.

The rightmost column in Tables 2 and 3 offer indications of the level of faculty participation in undergraduate research within colleges. Engineering, Arts and Sciences, and Agricultural Sciences and Natural Resources had the highest within college participation rates. All were well above 60% participation rates while faculty in the remaining colleges were well below one-third participation rates. It is true that among these colleges, small Ns do not allow reliable conclusions. Data in these two tables also allow for comparisons over time with respect to participation rates within colleges.

The data in Tables 4 and 5 compare faculty participation rates across five disciplines. Not surprisingly, science and engineering had the highest participation rates with social sciences placing next in the ordering. Moreover, participation rates across discipline reveal very high within discipline participation rates for science, engineering, and social science and rather low within discipline participation rates for arts/humanities and faculty in departments offering primarily professional degrees.

Table 1		
Faculty Participation in Undergraduate Research		
	Current Participation	Participation in Last 5 Years
All Faculty		
YES	61.8%	81.2%
NO	38.2%	18.8%
Tenured Faculty		
YES	58.5%	83.0%
NO	41.4%	17.0%
Untenured Faculty		
YES	67.2%	78.1%
NO	32.8%	21.9%

Table 2				
Faculty Participation in Undergraduate Research by College (Participating Now)				
College	Participation Rates Across Colleges	Participation Rates Within Colleges		
		(N)	YES	NO
Agricultural Sciences and Natural Resources	7.7%	(13)	61.5%	38.5%
Architecture	1.0%	(2)	50.0%	50.0%
Arts and Sciences	60.6%	(87)	72.4%	27.6%
Rawls College of Business	1.9%	(4)	50.0%	50.0%
College of Education	0.0%	(3)	0.0%	100.0%
Whitacre College of Engineering	24.0%	(32)	78.1%	21.9%
Human Sciences	1.0%	(9)	11.1%	88.9%
College of Mass Communication	0.0%	(1)	0.0%	100.0%
Visual and Performing Arts	1.0%	(9)	11.1%	88.9%
Allied Health Sciences	0.0%	--	--	--
Other	2.9%	(9)	33.3%	66.7%

Table 3				
Faculty Participation in Undergraduate Research by College (Participation in the Last 5 Years)				
College	Participation Rates Across Colleges	Participation Rates Within Colleges		
		(N)	YES	NO
Agricultural Sciences and Natural Resources	8.8%	(13)	91.3%	7.7%
Architecture	1.5%	(2)	100.0%	0.0%
Arts and Sciences	52.6%	(87)	82.8%	17.2%
Rawls College of Business	2.9%	(4)	100.0%	0.0%
College of Education	0.0%	(3)	0.0%	100.0%
Whitacre College of Engineering	19.7%	(32)	84.4%	15.6%
Human Sciences	4.4%	(9)	66.7%	33.3%
College of Mass Communication	0.7%	(1)	100.0%	0.0%
Visual and Performing Arts	4.4%	(9)	66.7%	33.3%
Allied Health Sciences	0.0%	--	--	--
Other	5.1%	(9)	81.1%	18.9%

Table 4				
Faculty Participation in Undergraduate Research by College (Participation in the Last 5 Years)				
College	Participation Rates Across Colleges	Participation Rates Within Colleges		
		(N)	YES	NO
Science	43.3%	(58)	77.6%	22.4%
Engineering	24.0%	(32)	78.1%	21.9%
Social Science	15.4%	(20)	80.0%	20.0%
Arts/Humanities	4.8%	(24)	20.8%	79.2%
Professional	12.5%	(34)	38.2%	61.8%

Table 5				
Faculty Participation in Undergraduate Research by College (Participation in the Last 5 Years)				
College	Participation Rates Across Colleges	Participation Rates Within Colleges		
		(N)	YES	NO
Science	38.2%	(58)	89.7%	10.3%
Engineering	19.9%	(32)	84.4%	15.6%
Social Science	12.5%	(20)	85.0%	15.0%
Arts/Humanities	10.3%	(24)	58.3%	41.6%
Professional	19.1%	(34)	76.5%	23.5%

Appendix C

Advancing The Culture of Undergraduate Research at TTU

- Promote Scholarship of Discovery
 - any scholarly or creative activity ranging from traditional scientific experimentation to the creation of new artistic works
 - any scholarly or creative activity ranging from traditional scientific experimentation to the creation of new artistic works
 - discovery of knowledge
 - creation of knowledge
 - research apprenticeships
- Develop Undergraduate Research Web Pages: Do this for each department (Psychology provides a model: <http://www.depts.ttu.edu/psy/undergradresearch/facultypages/faculty.php>). Includes sole and co-authored papers
- Talking head videos for each department introducing faculty, research interests, etc
- Develop research opportunities within a Broad Range of Disciplines
- Develop and implement mechanisms for Creative Motivation
 - certificate that officially designates their participation in research on their transcript
 - graduation with distinction
 - small grants to students
 - posting part-time research job listings
 - prizes
 - international research opportunities

- Develop and promote Freshman and Sophomore Participation
- GPA Not A Criterion beyond some minimum (e.g., 3.0) for research participation
- Develop Creative Funding opportunities for faculty, like the development of research seminars
- Develop and support an Undergraduate Research Publication
- Develop Students' Research Projects Website. Include student posters, presentations, and publications
- Provide Grants for student travel for research presentations
- Don't Overlook:
 - Responsible research – OKLAHOMA STATE UNIVERSITY
 - Logistics for supporting undergraduate research – IOWA STATE
 - Library liason and resources - DUKE
- Resources to Prepare to Interview with Mentor
 - Check with Michael San Francisco and TTU/HHMI for "protocol"
 - Prepare to apply link on websites
 - Getting started links on websites
 - training modules on websites
 - seminars
 - research skill building workshop
 - student research experience course

Appendix D

Undergraduate Research at Texas Tech University: A Status Report 2002

Texas Tech University has a long history of involving its undergraduates in research. Until recently, no attempt has been made to provide central coordination for undergraduate research programs and opportunities or to ascertain the extent of institutional involvements. In September 2002 a new position of Associate Vice President for Undergraduate Research was created within the Division of Vice President for Research, Graduate Studies and Technology Transfer. Also in September 2002, a questionnaire was sent to all department chairs and area coordinators as a first step in evaluating the extent of Texas Tech's commitment to UGR in terms of financial support, faculty time, and student participation. Questions were also directed toward what steps should be taken to overcome current obstacles in order for the institution to expand its role in providing undergraduates with a research experience. A separate questionnaire was sent to all deans responsible for baccalaureate degree programs to gain their perspectives as well.

Results of the Chairperson Survey

Responses were received from 25 of the 42 academic units representing a return rate of 59%. The results of the survey are attached. It is noteworthy that 52% of the responding areas consider participation in URG for tenure and promotion and 64% consider faculty participation in determining merit salary increases.

Student Enrollment in Undergraduate Research Courses

In September 2002 an accounting procedure was established whereby we can track the total number of student enrollments in undergraduate research classes. The Office of Institutional Research and Information Management is now programmed to provide official enrollment data each term for the 91 currently listed undergraduate research courses. For FY 2002 the total enrollment was 1,990. The enrollment distribution by college is shown below.

Agricultural Sciences and Natural Resources	144
Architecture	92
Arts & Sciences	1,157
Rawls College of Business	21
Education	44
Engineering	249
Human Sciences	283

In the fall semester of 1991, enrollment was 848. For the current semester (Fall 02) 888 students were enrolled in research courses. The actual number of students actually participating in research is undoubtedly higher than the enrollment numbers reveal. Not all students doing research projects formally enroll in a given course. In addition, traditionally The College of Engineering has strong involvement with undergraduates and faculty. No data was received from five of the eight engineering departments.

Support Provided by the Deans

Several of the colleges provide funds to support UGR. These funds come from state budgets, grants and endowments. The current level of investment is shown below.

Agricultural Sciences and Natural Resources	\$10,000
Engineering	7,500
Honors	100,000
Human Sciences	7,500

It should be noted that the actual support for UGR at the college level is actually greater than what is indicated above. Most of the colleges, such as Arts & Sciences, provide indirect UGR support in the allocation of department budgets

Total Support for Undergraduate Research

In addition to the college and department funding support mentioned above, Texas Tech receives major funding support in two areas, the Howard Hughes Medical Institute and the McNair Scholars programs. The extent of this support is indicated below:

HHMI	\$500,000
McNair	245,336
TTU match	350,000

In summary, the total funding support for FY03 from all sources is approximately \$1,703,380*.

*Includes university support of the Associate Vice President for Undergraduate Research

Obstacles/Challenges to Expansion of Undergraduate Research

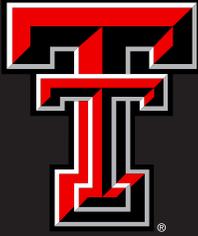
The questionnaire sent to chairpersons asked for comment on what would be needed to expand their unit's participation in UGR. The most commonly mentioned items were:

- Funding to support student stipends and supplies
- Increased research space to accommodate more students
- Faculty release time
- Faculty rewards (credit for directing students in terms of tenure, promotion and merit pay increases)
- The university needs to publicize the importance of an undergraduate research experience
- Students need to be better informed about the value of an inquiry-based opportunity in their discipline
- The faculty need to be encouraged by the President, Provost and Deans to incorporate students into their research endeavors

Recommendations

Texas Tech University's current involvement in undergraduate research in terms of funding, faculty time and the number of students involved (approximately 10%) is impressive. If Tech is to keep pace with the growing national trend to emphasize inquiry-based learning in undergraduate curricula, we must give careful thought to costs vs. benefits of expanding our efforts. Certainly the benefits of building a research component into all our baccalaureate programs would be of great value to our students. In order to expand our student participation and keep pace with our colleagues at other research universities, the following recommendations are provided:

- Make undergraduate research a part of the university's strategic plan and the strategic plan for each academic area.
- Place an emphasis on increasing endowment funds so that more students can be offered research stipends.
- Effectively communicate the benefits of undergraduate research to our faculty and students.
- Call attention to undergraduate research opportunities in all official university publications.
- Encourage academic units to award faculty participation in undergraduate research when considering tenure, promotion and merit pay increases.
- Institute a new award recognizing a faculty member's outstanding contributions to undergraduate research.
- Publish an undergraduate research journal.
- Expand Research Days to include all academic disciplines.



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