

WT 125 Generational Plan

Colleges and Responsibility Areas

Date

March 26, 2018

Area of Responsibility Name

Paul Engler College of Agriculture and Natural Sciences

Introduction

The Paul Engler College of Agriculture and Natural Sciences is comprised of the Department of Agricultural Sciences (AGS); the Department of Chemistry and Physics (CP); and the Department of Life, Earth and Environmental Sciences (LEES). In addition to providing expertise to the University's general education curriculum via faculty participation in teaching courses in analytical reasoning, the college also offers, by its various components, a variety of undergraduate and graduate programs including the only doctorate program on campus and majors. All are directed toward preparing individuals who will be competent and competitive in scientific, technical, educational and professional occupations.

The mission of the college is to provide excellence in teaching, research and professional service in the major areas served and, ultimately, to prepare students for employment by providing them with a skill set that will make them successful now and into the future, regardless of their chosen path.

The internationally recognized faculty of the college is eager to work with students in the classroom, in the laboratory and in the field. Students can pursue a variety of activities, from assisting faculty in conducting cutting-edge research to completing an internship with a company competing in the global marketplace. These real-world experiences in the various disciplines are the hallmark of the college and University.

In addition to the outstanding academic training students receive, the college offers a wide variety of extracurricular activities, including competitive teams, departmental student organizations, service-learning activities and leadership opportunities.

Our college produces people and knowledge that support our growing economy through a very broad variety of industries – from ranching and greenhouse agriculture to biotechnology, livestock industry, business management, health sector, and social services. In terms of number of students AGS has the largest share after LEES and CP has the least. The impact of agricultural industry to the area is significant. The following demonstrates the dramatic and far-reaching economic impact of agricultural and livestock industry on regional and state economy. According to Amosson et al (2015) Texas Panhandle area has 16,600,000 acres total that includes 15,300,000 acres dedicated to agriculture, 5,800,000 acres in cropland, and 1,500,000 acres irrigated cropland. If these counties were a state, they would rank first or second in beef production, depending on the

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year and in the top 15 in dairy, swine, corn, cotton, sorghum, and wheat production. Relative to other counties in Texas, this area has the: Top 8 counties in ag receipts, Top 6 counties in fed beef, Top 6 counties in swine, 4 of the top 6 counties in dairy, Top 2 counties in corn, and Top 2 counties in wheat. The \$5.7 billion in agriculture receipts (\$1.7 billion in crops and \$4.0 billion in livestock) leads to total region-level economic contribution of \$9.4 billion and a state level economic contribution of \$11.3 billion. Additionally, there is \$1.35 billion in payroll and 51,590 jobs are supported by local Agribusinesses and \$138 million in farm program payments. The value of agriculture to the Panhandle has more than doubled in the past 20 years. The health and social services may also have significant contribution to the regional economy but not as much as agriculture has in the Texas Panhandle.

Paul Engler College of Agriculture & Natural Sciences in the 21st century need to be where the world is going, not where it is today. Major periods of change have occurred in the past and over time our societies and commerce adapted either rapidly or slowly. Today many significant changes are happening concurrently – technology, demographics, economics, resources, physical and virtual infrastructures, life forms, genetics, and general infrastructure are changing; the scale is larger; the speed is faster and more globally interconnected; the degree and complexity of change requires greater effort on the part of many institutions. Colleges like ours have changed dramatically over the years. It is indeed recognizing that colleges like ours impact an enormous proportion of our community and we are central to the region's changing economy.

Our college is already making headway to put the needed resources together to support the scholarship activities in all three core areas of teaching, research, and outreach. The most significant milestone was achieved by naming Paul Engler College of Agriculture and Natural Sciences in November 2017. The generous gift from Engler Foundation will not only significantly benefit scholarships, professorships, named spaces, community outreach, and strategic planning/improvement for our students, faculty, and community, but also will serve a leading role to encourage others to invest in higher education through West Texas A&M University. The New Agricultural Science Complex building to be opened in Fall of 2018 and recent commitment from Texas A&M University System for Veterinary Education Research and Outreach building are other milestones that will significantly contribute to meeting the needs of our students, faculty and community in future. These milestones will help in achieving the goals stipulated in the mission of WT 125 initiative.

Narrative to Address Innovation Components:

The reduction of teaching loads is critical to the university's goal to transform WTAMU into a high caliber regional research university. Resources needed to make this happen include the hiring of new faculty, hiring of PTIs to cover fundamental courses, and provide faculty with more graduate assistantships to cover laboratory courses. The development of different faculty tracks will also be helpful. The establishment of endowed professorships in the agricultural sciences, biological, environmental and natural sciences will help recruit and retain talented faculty. This will require donations from alumni (e.g., doctors, dentists) or industry (e.g., oil and gas/environmental science) to set up the endowments.

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To develop into a high caliber regional research institution, WTAMU will need to invest in recruitment of talented graduate students. This is done at many institutions with assistantships (stipends) – many assistantships are state-funded, but others can be funded through research grants or endowments. WTAMU should increase the number of assistantships available, as well as address the issues of graduate assistant workloads and pay.

Adequate laboratory space and equipment for research faculty and graduate students is an obvious need if WTAMU is to expand into a regional research institution. Although this issue will be initially improved with the move of the Agriculture Department to its new building, freeing up space in current building for LEES and CP, it still only partly accommodates the needs of current faculty in these disciplines. Only with renovation of the existing space to return office-type space into laboratory space, will the current building sufficiently support teaching and research needs.

Theme Group Name

The Panhandle and Its Heart-The I-27 Corridor

Key Idea (1)

Key Idea (1)

Strengthening Partnerships: WTAMU – Canyon – Amarillo – The Panhandle.

In today's world, the rapid dissemination of information and the ability to tell / promote is imperative to the growth and to the forming of industry partnerships in the Paul Engler College of Agriculture and Natural Sciences.

Goal 1:

Disseminate College information, stories, events, etc. in real time to the Panhandle Region to promote academics, research and service activities for attracting both students and industry partners to the college.

Action(s) 1.1:

Hire a full-time communications expert for the College.

Measurable Outcome(s) 1.1.1:

Track the dissemination of information and determine if a correlation exist between the dissemination of information, enrollment growth and industry partners.

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Key Idea (2)

Key Idea (2)

Help facilitate student job placement at local scientific and medical institutions as well as agricultural industry following graduation from WT through various outreach events, which would also contribute to the growing local economy in the Texas Panhandle.

Goal 1:

The college recognizes the importance of putting current WT students in touch with potential future employers amongst the local scientific and medical communities, thus this goal is intended to improve upon this process through the use of its student organizations to make these professional contacts.

Action(s) 1.1:

The various student organizations can be used facilitate this process. These organizations can be used to host various "meet and greet" events in which members of the local scientific and medical communities are invited to WT as guest speakers, followed by informal discussions with students. This is being done currently with Career and Education Expos and it needs to be expanded. Some examples of organizations that have employed graduates in past that can be included amongst invited guests include Amarillo ISD, Friona ISD, Dalhart ISD, Hereford ISD, Lubbock ISD, Bushland ISD, Pampa ISD, Panhandle ISD, Miami ISD, and Canyon ISD. Other employers of our graduates in the past have also included Pantex, Valero, Mednax, Maxor Pharmacy, Roden Smith Pharmacy, Lonestar Scribe, Rhino Medical Services, Silliker labs, Mobile Veterinary Practice, Bell Helicopter, Teach for America as well as the Amarillo Pathology Group to name a few. Furthermore, events such as these can help to improve relationships between the panhandle community as a whole and WT, and possibly result in an increase in scholarships and internships for our students (see also Theme Group "Financial Resources").

Measurable Outcome(s) 1.1.1:

The office of Career Services tracks this information regularly, so this goal can readily be evaluated annually to see if there is in fact an increase in the number of graduates from WT that gain employment as a result of outreach events such as these.

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Theme Group Name

Human Capital

Key Idea (1)

Key Idea (1)

Work Load Symmetry and Fairness; Shifting Allocations of Teaching, Service, Research/Scholarship
In order to reduce the amount of clerical and administrative duties continually placed on faculty more support staff needs to be hired so faculty can focus on conducting quality instruction, research and service activities. As long as teaching and academic advising loads are heavy (12 ACH or even 9 ACH), faculty will be limited in the amount and quality of research they can conduct. Conducting research in the current professional setting requires the submission of research proposals to secure funding, as well as a large amount of time for the actual research in the laboratory or field. A serious effort to increase research productivity at WTAMU will require significant reductions in the faculty work load.

Goal 1:

Hire a full-time support staff for each of the three departments in the college.

Action(s) 1.1:

Request additional state funding for support staff with salaries that will attract highly qualified individuals to the university.

Measurable Outcome(s) 1.1.1:

A reduction in the faculty's administrative and clerical duties should result in higher productivity in the areas of teaching, research, and service.

Goal 2:

In general, faculty more heavily engaged in research should be shifted to no more than 6 ACH per semester.

Action(s) 2.1:

There are several ways to address the faculty load issue: (1) hire additional faculty to spread out course loads; (2) hire PTIs to cover basic courses, releasing faculty to conduct more research; (3) hire more Graduate Assistants to reduce the number of labs each faculty member must teach; and (4) set up different position tracks to enable faculty to specialize in either teaching or research, depending on their strengths and interests. If the track option is utilized, "teaching faculty" can remain at 12 ACH (with a limited research requirement) or go to 15 ACH (with no research requirement), whereas

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“research faculty” will be assigned 6 ACH (with higher expectations for research than currently exist). Adding new faculty positions will also help reduce the number of student advisees per faculty member.

Measurable Outcome(s) 2.1.1:

With reduction in faculty teaching load, higher research productivity should result. Research faculty should achieve excellence not only in research, but also in teaching their courses.

Key Idea (2)

Key Idea (2)

Establish endowed professorships/chairs in all the three Departments in our College to support hiring and retaining faculty. These chairs/professorships could be set up to provide the awardees with resources (1) to assist in conducting research (including involvement of both undergraduate and graduate students) and teaching; and/or (2) to provide enhancement of salary to attract and retain talented faculty. Faculty receiving these professorships should receive a lighter teaching load to enable them to effectively pursue research, including proposal writing and publication.

Goal 1:

Set up endowments to support these professorships by securing donations from local or regional alumni in the agricultural sciences/industry, biomedical sciences (e.g., doctors, dentists, pharmacists) and environmental science (industry).

Action(s) 1.1:

Identifying and contacting potential donors in the alumni community.

Measurable Outcome(s) 1.1.1:

Success would be measured by the establishment of the professorships. Faculty receiving these professorships should demonstrate a high level of productivity in research, and be rated as Excellent or better in teaching.

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Theme Group Name

Our Relationship to Community Colleges

Key Idea (1)

Key Idea (1)

First-Choice Destination for Transfer Students in the State

Create a pipeline of transfer students from Amarillo College to the Paul Engler College of Agriculture and Natural Sciences

Goal 1:

Assist in the establishment of an Associate Degree in Agricultural Sciences at Amarillo College.

Action(s) 1.1:

Work with AC Officials to establish an agricultural degree program at Amarillo College. Assist AC instructors with content development and conduct shared agricultural experiences with WT courses / students/ faculty.

Measurable Outcome(s) 1.1.1:

Track the increase enrollment numbers from AC and monitor graduate rates of these students.

Key Idea (2)

Key Idea (2)

Further develop our sciences curriculum such that it is similar in content to that of the curriculum offered at various community colleges in order to make a smooth transition for students transferring from community colleges to WT.

Goal 1:

It is imperative that transfer students not be at an intellectual disadvantage during matriculation to WT when compared to students at the junior and senior level who have attended WT since their freshman year. Therefore, comparisons between our all freshman and sophomore courses with respect to content taught here at WT to that of community colleges at the freshman and sophomore level are necessary in order to achieve this particular goal.

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Action(s) 1.1:

Faculty are encouraged to analyze various programs at the community college level in order to ensure that the subject matter taught here at WT is similar in nature to what is taught there with respect to all transferable courses. While this is not feasible to do with respect to every community college, focus can be maintained on the local community colleges to include Amarillo College, Clarendon College, as well as Frank Phillips College to name a few.

Measurable Outcome(s) 1.1.1:

It should be noted that meaningful communications between transfer students and faculty can be an invaluable tool to track the success of this particular goal. However, grade distribution comparisons can also be made between traditional incoming WT freshman students and their transfer student counterparts at the junior and senior level to ensure that similar results are achieved. If however, it is determined that transfer students do not perform as well as traditional incoming WT freshman students, further analysis of the chemistry and physics content being taught here at WT compared to community colleges will be necessary. The very nature of this goal should also prove to further strengthen our relationship with local community colleges as it demonstrates our commitment to the ultimate success of their students upon graduation here from WT with a four year degree.

Theme Group Name

Undergraduate Academics

Key Idea (1)

Key Idea (1)

Destinations for Panhandle high school and regional area graduates in top 25% of class.

Goal 1:

Establish the College as "First Choice" for Panhandle and area students who have the credentials to attend any university of their choosing.

Action(s) 1.1:

Increase admittance requirements and increase scholarship amounts given to

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prospective students that rivals WT competitors.

Measurable Outcome(s) 1.1.1:

Track the credentials levels of entering / transfer students, monitor retention rates, allow faculty to conduct "quality of student" evaluations, record graduation rates and conduct satisfaction surveys with employers.

Key Idea (2)

Key Idea (2)

The college recognizes the importance of core curriculum in the liberal arts and sciences, and is dedicated to quality improvement of our undergraduate courses taught in animal science, chemistry, biology, physics, and plant science. We continually strive to keep our undergraduate courses reasonable in size in order to maintain a more personable relationship between the instructor and the students.

Goal 1:

The college recognizes the importance of individualized attention necessary for students learning difficult scientific subjects such as chemistry and physics. Smaller classes not only provide such attention, but also facilitates with the sometimes difficult transition that undergraduate students can experience from high school to the college environment. We know from past research according to Tennessee's project STAR (Student Teacher Achievement Ratio) 1 report that higher academic achievement can be attained with classes limited to approximately 20 students. While this is not entirely possible for our college given the number of faculty members that we have versus the student demand for these courses, we constantly strive to keep the faculty/student ratio as small as possible. For example, this past spring 2018 semester, our General Chemistry and Physics I courses averaged approximately 40 students per class. It should also be noted that according to the same report, the enhanced academic engagement gained by smaller classes also leads to lower dropout rates, which ultimately contributes to improved student retention rates.

Action(s) 1.1:

Strive to offer undergraduate chemistry and physics classes with reasonable faculty/student ratios given the current number of departmental faculty members, and to hopefully increase the number of quality faculty members within the department as we grow in the future in part to achieve this goal.

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Measurable Outcome(s) 1.1.1:

It should also be noted that we also do have larger classes that are offered. One form of measurable outcome that can be obtained from this particular goal involves grade distribution comparisons between smaller and larger classes, which can be obtained from the office of Institutional Research. Also, retention rates from these classes can be obtained.

Theme Group Name

Graduate Academics

Key Idea (1)

Key Idea (1)

Teaching by Graduate Students, Impact of Teaching Quality; Graduate Fellowships.

Goal 1:

Establish a college based teaching academy for the sciences.

Action(s) 1.1:

Select a Director for the college Teaching Academy who will select "Master Teachers" from across college to instruct and guide graduate students through a series of lessons on how to teach and manage college level courses.

Measurable Outcome(s) 1.1.1:

Graduates of the teaching academy with 18 hours of graduate credit in their respective discipline will be allowed to teach undergraduate course(s). The Director of the teaching academy will conduct a minimum of three evaluations over the course of the semester and provide feedback on the quality of teaching and offered suggestions for improvement as needed. The Director's evaluation and the traditional year-end student evaluations would be the measures of success.

Key Idea (2)

Key Idea (2)

The college recognizes the importance of having top quality faculty members in order to attract good

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graduate students. “Good” faculty members in the college doing quality research are an invaluable tool to the experiential learning experience of our graduate students.

Goal 1:

We as a college are committed to the growth of our research program in order to attract quality graduate students.

Action(s) 1.1:

The college has been active in growing our diverse research programs, which includes cancer research, inorganic chemical research involving more cost efficient ways to development of biomedical devices, bacteria detection in food using laser technology, metabolic chemistry, astronomical research, nuclear magnetic resonance (NMR) imaging, as well as electromagnetic research. We will continue to grow and expand our research program. This can in part be achieved through the addition of quality faculty members to the departments with research interests that complement current research in all the disciplines here at WT.

Measurable Outcome(s) 1.1.1:

The measurable outcome from this goal involves annual monitoring of graduates with an advanced degree from the college, as well as expected increases in the overall research publications, grants and funding opportunities, and scientific conference proceedings.

Theme Group Name

Financial Resources

Key Idea (1)

Key Idea (1)

The college is fully aware for the need to minimize the burden associated with repaying overwhelming overall student debt.

Goal 1:

The overall goal here is to increase available scholarship money to students within the college.

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Action(s) 1.1:

Currently the college through its departments has several scholarships in place for students. Scholarships given to the departments are a direct result in part to the very positive relationships forged between the donors and the department as a whole, to include various faculty members. All faculty members in the college are highly encouraged to maintain/further develop these relationships and continually relay the needs of our students to the donors in order to increase available scholarship money.

Measurable Outcome(s) 1.1.1:

The measurable outcome here will involve comparisons of available scholarship money from year to year in order to track expected growth.

Theme Group Name

Intellectual Resources

Key Idea (1)

Key Idea (1)

The need for increased intellectual resources in order to sustain growth in the research program.

Goal 1:

Acquire more intellectual resources to include equipment and software necessary to support research programs.

Action(s) 1.1:

Currently the department is working on acquiring various resources in order to help support this goal. For example, we have recently purchased a Fourier-Transform Infrared Spectroscopy (FTIR), which is used to obtain infrared spectrum of absorption or emission of a solid, liquid or gas. This piece of equipment can be used to support the research (as well as teaching) program in the department for various applications such as the improved development of biomedical devices, bacteria detection in food using laser technology, metabolic chemistry, as well as cancer research. Future action items with respect to this goal involve acquiring more research equipment, as well as various software programs necessary to continue and expand our research capabilities through various grants and funding opportunities as well as donations to the department based on improved relations between the university and our current/new donors.

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Measurable Outcome(s) 1.1.1:

The measurable outcome from this goal involves annual monitoring of progress made by the faculty, which can be accomplished using various means to include an expected increase in departmental publications, grants and funding opportunities, as well as overall scientific conference proceedings.

Theme Group Name

Research and Infrastructure

Key Idea (1)

Key Idea (1)

Impact of Graduate Student Recruitment and Graduate Student Quality on Research

As research continues to assume higher importance at the university, the Department of Life, Earth, & Environmental Sciences needs to increase the number of funded Graduate Assistantships to enable recruitment of talented graduate students. Graduate assistants will receive stipends to teach laboratory sections of courses (both lower and upper division labs), conduct research under a faculty member, or both.

Goal 1:

By the year 2035, it is desirable for the Department of Life, Earth, & Environmental Sciences to have 10 or more Graduate Assistantships for teaching or research. Two of these should be competitive assistantships funded at a higher level through endowments so that we can recruit very high-quality graduate students.

Action(s) 1.1:

Increasing the number of graduate assistant positions will require significant new funding. Sources for this funding could include: (1) state funds, based on tuition revenues from higher student enrollments; (2) faculty research grants (short-term assistantships through the life of the grants); and (3) endowments derived from donations. The latter will require the identification of potential donors (alumni, industry, etc.) and developing a more significant presence in the community and region.

Measurable Outcome(s) 1.1.1:

How can the action be measured and what is the measurable outcome?

With more assistantships by 2035, graduate student productivity (higher-quality theses and publications) in our program should increase. This will also facilitate higher research productivity in the faculty.

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Key Idea (2)

Key Idea (2)

Adequacy of Lab Spaces for Research

The enhancement of research in the college will require increasing the amount of laboratory space for both faculty and graduate students.

Goal 1:

Each faculty member should have his/her own research space, preferably in the same building as the office space. The current ANS building will probably not be sufficient to accommodate growth in both Life, Earth, & Environmental Sciences (LEES) and Chemistry & Physics (CP), even with renovations. Current plans following the move of the Agriculture Department to their new building still leaves five LEES members with their research spaces in the Killgore Research Center or the Palo Duro Core Lab Facility.

Action(s) 1.1:

A short-term solution would be to carefully renovate the ANS building. There is currently an over-abundance of office space and inadequate lab space in this building – this can be improved upon. Ultimately, however, LEES and CP should probably have separate buildings. These renovations should include consideration of graduate student office/lab space.

Measurable Outcome(s) 1.1.1:

Having better lab facilities should translate into more productive research by faculty and graduate students.

Key Idea (3)

Key Idea (3)

The college recognizes the need for good quality faculty members engaged in meaningful research in order to grow our research and infrastructure capabilities.

Goal 1:

We are committed to the growth of our research program by recruiting quality faculty members engaged in meaningful research to support this goal.

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Action(s) 1.1:

The department has been active in growing our diverse research program to include cancer research, inorganic chemical research involving more cost efficient ways to development of biomedical devices, bacteria detection in food using laser technology, metabolic chemistry, astronomical research, nuclear magnetic resonance (NMR) imaging, as well as electromagnetic research. We as a department will continue to grow and expand our research program. This can be achieved through quality faculty addition to the department with members that complement current research, which will contribute to the improvement of research and infrastructure here at WTAMU.

Measurable Outcome(s) 1.1.1:

The measurable outcome from this goal will involve annual monitoring of overall faculty success in research within the department, which will involve the monitoring of expected increased publications, grants and funding opportunities, as well as scientific conference proceedings. It is also expected that more students will graduate from WT with advanced scientific degrees currently offered in the department.

Theme Group Name

Leadership Governance and Organization

Key Idea (1)

Key Idea (1)

The college recognizes the importance of leadership governance and organization.

Goal 1:

To encourage faculty to get involved in leadership roles within current and/or new professional and civic organizations in their disciplines and communities.

Action(s) 1.1:

Faculty involved in these organizations have the opportunity to acquire officer positions which serve to enhance their leadership skills.

Measurable Outcome(s) 1.1.1:

The leading measurable outcome for this goal involves the monitoring of

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students that obtain jobs involving leadership roles, which can be readily obtained from the office of Career Services.

Appendices and Additional Facts and Analysis

State-funded graduate assistantships are very common in institutions of higher learning, and serve as a tool to recruit graduate students. Currently, the Department of Life, Earth, & Environmental Sciences has only four such Graduate Assistant Teaching (GAT) positions. Each GAT here is responsible for teaching four laboratory sections plus one unit of lab preparation per semester, with a stipend of \$8700/academic year. Most similar institutions in the state and region are offering their graduate assistants lighter workloads and higher pay.

The college faculty are engaged in various levels of research. While several department members have been successful at getting research grants that enable them to hire graduate research assistants, most of the faculty must depend on GAT positions to fund their students (or the students must pay their own way – usually with student loans).

References

1 The State of Tennessee's Student/Teacher Achievement Ratio (STAR) Project:

<https://www.classsizematters.org/wp-content/uploads/2016/09/STAR-Technical-Report-Part-I.pdf>

Amosson, S., K. Ledbetter, M. Jones, R. Dudensing, R. Lu, J. Ellison, and B. Guerrero, 2015. "The Impact of Agribusinesses: Texas High Plains 2015." AgEco-FS 27. Texas A&M AgriLife Extension Service. TAMU System, College Station, TX.