
STRATEGIC INITIATIVE IMPLEMENTATION:
PLAN FOR AG & NATURAL RESOURCES
ENTREPRENEURSHIP

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**College of Agricultural Sciences
The Pennsylvania State University**

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EXECUTIVE SUMMARY

The College of Agricultural Sciences identified five programmatic priorities which were detailed in its 2008-2013 Strategic Plan. Entrepreneurship was chosen as the initiative with the highest priority. Our committee was tasked with determining a “game plan for entrepreneurship” within the College.

We view an entrepreneur as an individual or group that uses innovation to develop a novel business model or to improve an existing business model. The committee further presumed that a key to successful entrepreneurship is innovation and the pursuit of opportunity beyond the resources currently available.

With this characterization in mind, and the new strategic emphasis in the College, we believe that entrepreneurship holds virtually unlimited potential as a means to increase the success of our graduates, boost the competitiveness of external stakeholders, and enhance the reputation and status of the College.

We have identified a variety of ways in which College Units are currently engaged in programs or initiatives related to entrepreneurship. We believe that every Unit is either currently engaged in activities related to entrepreneurship and/or is in a position to benefit from greater alignment with the entrepreneurship initiative over the next five year period.

Looking beyond the Units, the committee sees numerous opportunities for collaboration both within Penn State and beyond. Perhaps the best example of collaboration already identified is with the College of Engineering’s Entrepreneurship Minor, but we also anticipate that such entities as the Smeal College, Center for Dairy Excellence, Ben Franklin Partnership, and various trade associations will be willing partners with our entrepreneurship initiatives.

The capacities of the Units to easily align with this initiative is critical since student and external stakeholder groups are increasingly demanding a basic exposure to entrepreneurship, and in many cases desire an in-depth understanding of key topics related to entrepreneurship (entrepreneurship).

Examples of emerging needs that our committee sees include:

- The College will need a focal point to coordinate the increasing volume of entrepreneurship related activities
- Demand from undergraduate and graduate students to be exposed to entrepreneurship
- Demand for access to courses and advanced degrees in entrepreneurship
- Demand for alternative methods of disseminating entrepreneurship training within Extension

- Demands for increased focus on innovative, leading edge businesses in such areas as “green tech” or bio-fuels that can use entrepreneurial activities to mitigate environmental challenges
- Demand for Youth Entrepreneurship Programs

Our plan for specific actions that the College should take includes the following:

1. Create and fund a world class Center that will lead the College’s efforts in entrepreneurship. The Center should provide a focal point for innovative entrepreneurship training through resident education, extension and research.
2. Build awareness among CAS undergraduate students about the importance of entrepreneurship.
3. Encourage CAS students to take courses available in Engineering and Smeal that will enhance their understanding of entrepreneurship. Encourage the more motivated students to consider the Entrepreneurship Minor offered by Engineering.
4. Build awareness among faculty about the importance of entrepreneurship with respect to their own teaching and research efforts.
5. Continue and build support for Extension’s increasing emphasis on entrepreneurship via its Natural Work Groups (AE-NWG).

The following two sections were added to the Executive Summary in order to detail our prioritization of items related to Entrepreneurship in the College.

PRIORITIES FOR ENTREPRENEURSHIP: PROPOSED MAJOR INITIATIVES

- 1) Initiate a new Center for Ag & Natural Resources Entrepreneurship that will coordinate and enhance CAS entrepreneurship activities in resident education, extension education, and research and provide leadership to increase the visibility of our entrepreneurial capabilities to university, state and external stakeholders.
 - a. Name current faculty as managing director, asst. director for extension education, and asst. director for research and education. Fund a staff assistant.
- 2) Utilize the Extension Agricultural Entrepreneurship Natural Work Group to enhance service to agricultural, natural resource, and food entrepreneurs by

investing in 2-3 full time Extension Associates with responsibilities to consult with clients. Consultation might include guidance with business planning financing, intellectual property issues, financial management, and other key topics. Identify a set of current extension educators to be formally assigned to support the Center's extension and outreach activities.

ENTREPRENEURSHIP ACTION PLAN: NEAR-TERM, LOW COST ITEMS

- 1) Fall 2009 - *Host a seminar on entrepreneurship funded by the Harbaugh Endowment for Entrepreneurship*
 - a) Barry Zoumas will work with Mr. Harbaugh and College leadership to coordinate a seminar to be held during late fall 2009.
 - b) Initiate a Visiting Entrepreneur series and coordinate interaction with students, faculty and Staff.

- 2) Fall 2009 - *Initiate Student Entrepreneurship Club*
 - a) Jeff Hyde and Kathy Kelley will oversee the development of an undergraduate entrepreneurship club which would facilitate networking among students, faculty, and established entrepreneurs;
 - i) offer presentations delivered by speakers who inspire others to pursue entrepreneurial activities (i.e., via the Harbaugh seminar series);
 - ii) provide opportunities to participate in regional and national conferences and competitions (e.g., idea pitch, business plan) to showcase collaborative entrepreneurial activities.

- 3) Fall 2009/Spring 2010 – *Promote Entrepreneurship education within CAS Units and to CAS students*
 - a) Kathleen Kelley and Troy Ott will work with Office of Undergraduate Education and Unit personnel to promote e-ship within the College
 - b) Add existing Entrepreneurship classes (e.g., ENGR 310, 411) as electives in appropriate CAS majors.
 - c) Modify existing Ag 150s course to introduce entrepreneurial principles to all CAS students

- 4) Fall 2009/Spring 2010 – *Investigate opportunities for working with the PSU Office of Technology Transfer (OTT) to enhance commercialization of innovations by CAS personnel.*
 - a) Troy Ott and Mark Gagnon will initially meet with OTT personnel to explore potentials for improved communication and cooperation between CAS faculty and OTT.

- i) Determine if OTT is providing adequate assistance for CAS faculty
 - b) Work with OTT to expose CAS faculty to entrepreneurs and the entrepreneurial endeavor.
 - i) The OTT and CAS should co-sponsor speakers related to the invention-commercialization enterprise, which could be held in conjunction with the Spring Harbaugh Endowment presentations.
- 5) Fall 2009/Spring 2010 – *Work with leadership of ENRI and PSIEE to determine opportunities for “ecopreneurial” activities related to those organizations*
 - a) Judd Michael will investigate current efforts related to such areas as bio-energy, carbon sequestration, and sustainable building materials, and determine opportunities for commercialization.
- 6) Spring 2010 – *Work with OTT to determine current patent applications (and invention disclosures) in process from CAS faculty.*
 - a) Judd Michael & Mark Gagnon would develop a matrix for the CAS portfolio of innovations currently being developed.
 - b) Utilize the matrix to help visualize the College’s entire portfolio and how it could be optimized.
- 7) Spring 2010 - *CAS Faculty will teach a course in Entrepreneurship*
 - a) Dr. Mark Gagnon has been hired on a USDA grant and will teach one section of ENGR 310 to give our students adequate opportunities to take this key course in the Engineering Entrepreneurship Minor.

#1. INTRODUCTION AND BACKGROUND ON ENTREPRENEURSHIP

Entrepreneurship was selected as one of the College's five strategic initiatives based on the recommendations of the Economic Sustainability team that met in early 2008 to provide input to the formation of the College's strategic plan. The Economic Sustainability Team at that time recommended the creation of a Center for Innovative Entrepreneurship or Center for Green Entrepreneurship. The spring 2008 team leaders met with the College leadership team to prioritize team recommendations and entrepreneurship was placed at the top of the list.

Based on these outcomes, the recommendation to form an entrepreneurship center is featured prominently in the College's 2008-2013 strategic plan. Our committee expanded upon this recommendation and further refined the idea of a center along with a broader view of how to implement a strategic initiative related to entrepreneurship.

Characterization of Entrepreneurship

We can start by defining entrepreneurship as the practice of starting new organizations or revitalizing existing organizations in response to identified opportunities. We view an entrepreneur as an individual or group that uses innovation to develop a novel business model or to improve an existing business model. Entrepreneurial activity attempts to capitalize on innovation or opportunity (e.g., for financial or altruistic reasons), and can be what is termed “incremental” entrepreneurship or “quantum” entrepreneurship.

The committee further presumed that a key to successful entrepreneurship is innovation and the pursuit of opportunity beyond the resources currently available. For a potential entrepreneur this then becomes a combination of innovative thinking and depth of knowledge in a discipline, integrated with the personal motivation to make something economically greater than what currently exists. It is significant to note that entrepreneurs are typically not lone trailblazers. More often than not they are parts of teams of like-minded people, each with individual strengths that contribute to the success of the entrepreneurial entity. Entrepreneurs can work in small start-up firms or inside large multi-national corporations.

The March 2009 issue of *The Economist* provides another relevant description that helped to guide our thought process:

For most people the term “entrepreneur” simply means anybody who starts a business, be it a corner shop or a high-tech start up. We use the word in a narrower sense to mean somebody who offers an innovative solution to a (frequently unrecognized) problem. The defining characteristic of entrepreneurship, then, is not the size of the company but the act of innovation.

Entrepreneurs innovate, and innovation is the specific instrument of entrepreneurship.

Our committee recognized the important relationship between entrepreneurs and innovation, and further recognized that our College is a breeding ground for unique and potentially valuable innovations that may not be reaching their full potentials. Finally, it is worth noting that entrepreneurial thinking at small, agile companies is what is driving the economy and could be the greatest factor in recovery from the current recession.

#2. CURRENT PROGRAMS AND INITIATIVES

Individual academic Units across the College have identified a variety of ways in which they are currently, or will in the future, participate in addressing entrepreneurship as a strategic priority.

Some brief examples from the Units include:

- Faculty in the Department of Agricultural and Extension Education have developed curriculum to help youth develop financial and money management skills, which helps to prepare youth for roles as future entrepreneurs.
- The Department of Agricultural Economics and Rural Sociology has conducted evaluations of entrepreneurial agricultural supply chains, industry clusters and local food networks, has instituted undergraduate study experiences in Costa Rica for students majoring in agribusiness, is working towards establishing a Center for [Green] Entrepreneurship, held the Women in Agriculture Leadership Training program to support local agricultural development, and hosted the National Youth Entrepreneurship Symposium.
- The Department of Crop and Soil Sciences will focus on the rapidly expanding eLearning turfgrass programs to continue to provide timely outreach to the turfgrass industry and develop a Center for Excellence in Sustainable Landscapes.
- The Department of Food Sciences is placing more emphasis on providing resources that entrepreneurs in the food industry need to develop new ventures, as opposed to their traditional emphasis on supporting already existing food companies. In addition, they will also continue supporting the Berkey Creamery in its goal to become a more efficient, better managed provider of retail dairy products.
- A major goal of the Department of Horticulture is to help diverse horticultural businesses in Pennsylvania remain both environmentally and economically sustainable. The Department recognizes increased opportunities for non-traditional businesses, such as community supported agriculture (CSA), value-added processed products, and urban horticultural products. The Department also will continue to support the Cellar Market as a unique opportunity to provide instruction on marketing and to gain research information concerning consumer preference and attitudes related to horticultural products.
- The School of Forest Resources emphasizes entrepreneurship primarily via its Wood Products Business and Marketing degree program. Students work closely with industry leaders and engage in projects designed to prepare them to manage their own businesses. The School also works with industry clientele to assist with product development, economic forecasts, and research and development of a wide range of products.
- In the Department of Plant Pathology, two initiatives involving mushrooms have resulted or will result in industries creating jobs. Research projects on spent mushroom compost have led to the development of new industries that utilize

- spent mushroom compost and another current research project involves utilizing mushrooms as a platform for producing pharmaceuticals.
- In the Department of Poultry Science, faculty have been encouraged to seek patent protection of intellectual property and, within the past decade, two inventions by Poultry Science faculty members led to patents and the establishment of a company.
 - The Dairy and Animal Science Department utilizes entry level courses to expose their majors to agricultural entrepreneurs and its capstone courses require students to conduct top-to-bottom evaluations of whole animal enterprises and provide detailed SWOT analyses to their owners.
 - The Veterinary and Biomedical Science Department has a major focus in the area of translational research. This is evidenced by an increasing number of invention disclosures and patent applications filed by VBS faculty. These are, in-turn, licensed to outside companies. Members of the VBS faculty are also encouraged to start up companies and engage in sabbaticals with a translational research focus in academe or industry. Three members of our faculty have started-up biotechnology related companies, and this trend is expected to grow in the future.

#3. STAKEHOLDER AND STUDENT NEEDS

Individuals, companies and communities need entrepreneurs to innovate, to create wealth, and provide economic diversity that drives the economy and improves the quality of life for all citizens of Pennsylvania. Entrepreneurs are found at the leading edge of society in all aspects of our economy and culture. Regardless of what drives their passion to innovate, whether it is to generate wealth or for the betterment of society, or the intersection between the two, entrepreneurs are the engines of our economy and our hope for future prosperity.

The goal of this plan is to support and guide the University and College strategic initiatives in entrepreneurship. This initiative was born out of expressed need from our students and stakeholders and vision from our faculty and administration on how to meet this need. This need takes as many forms as there are business models. In general, there are a few common threads found among all. There is a need for our students and aspiring entrepreneurs to understand the nature, composition and character of entrepreneurial entities. They need to know that entrepreneurial entities, more often than not, are comprised of teams of entrepreneurial individuals each with unique strengths. This knowledge alone is empowering, as budding entrepreneurs realize that they will be most successful if they assemble a skilled team rather than taking a “go it alone” approach. Understanding where one fits into an entrepreneurial entity requires an understanding of the characteristics of successful entrepreneurs. In addition, it also requires the ability to assess how each team member’s skills and strengths can be best utilized in an entrepreneurial endeavor.

Entrepreneurs look to the University for *discovery science* that will help them innovate. The only way to improve the flow of technology and innovation from the lab bench to our clients in the Commonwealth is for University faculty to understand the key role they play at the origin of the innovation pipeline. This can be improved by better educating faculty on their responsibilities to disclose inventions and work to implement their innovations. This requires faculty with active, cutting edge research programs that are themselves entrepreneurial. Supporting this is the need for a shift toward valuing outcomes over outputs. Outcomes are the tangible results of a process whose primary aim is to serve society. Outcomes are positive changes that either open new avenues for entrepreneurs or refine existing processes or business models to make them more competitive, profitable and sustainable.

Entrepreneurs are the single greatest job creators in our economy, and the University is tasked with providing the skilled workforce for them to implement their business plans. In this regard we must awaken and inspire students to become more entrepreneurial in their thinking. These students must be more flexible, mobile, creative and skilled in science, technology, engineering and math. This calls for a proactive resident education program focusing on the characteristics of entrepreneurial entities that emphasize team building and leadership skills. This must be accompanied by world class undergraduate

curricula to provide the breadth and depth of knowledge that entrepreneurs need to be able to recognize and capitalize on entrepreneurial opportunities. The composition and qualities of entrepreneurial entities do not change much across business models. This allows the University to expand existing programs in entrepreneurship without the need to duplicate major portions. However, there are discipline-specific skills and qualities of agricultural entrepreneurs that will need to be built into our existing 300-400 level courses to help agricultural entrepreneurs succeed. Fortunately, many classes across the College have already begun this process.

However, to really excite students about entrepreneurship we need to do a better job of connecting the classroom experience with real world entrepreneurs. We can do this through invited lectures, seminar series featuring agricultural entrepreneurs and through the promotion of a student organization focused on agricultural entrepreneurship. We need to develop programs that would support student entrepreneurs to develop, market and launch new businesses. We should include graduate and advanced undergraduates in Extension programs that support stakeholders. The overarching goal of these activities is to inspire, develop and support students to become the next generation of agricultural and natural resources entrepreneurs. This is absolutely required if Pennsylvania is to continue to benefit from the wealth and jobs that are created from a strong and diverse natural resources sector.

Our clients (stakeholders) in the state rely on Extension programming to re-train and re-tool. Extension programs delivered to groups inspire and motivate entrepreneurial activities. However, to support budding entrepreneurs Extension must also engage in responsive support that is still best delivered on a one-to-one basis, and that is customized to the need. This need is particularly pressing because there are dramatic changes underway in agriculture that are opening new opportunities for agricultural entrepreneurs. One example is the rapid growth small and medium-sized farms that cater to individuals wanting to purchase locally-grown products that are raised in sustainable agricultural enterprises. In addition, there is growth in small businesses designed to detect and remediate the impacts of agriculture on the environment. Extension programs are already serving these new stakeholders, many of which have little or no agricultural background. These needs are immediate, and if we expand and grow our Extension efforts in these areas, the impact of our initiative in entrepreneurship will also be immediate.

#4. OPPORTUNITIES FOR COLLABORATION

One of the key opportunities for collaboration is in the area of resident education, with an objective of increasing opportunities for CAS students to take coursework related to entrepreneurship. Perhaps the most important collaborative arrangement will be with the College of Engineering's Entrepreneurship Minor. Members of our committee have had multiple meetings with leadership of the entrepreneurship minor, and those persons are very willing to work with us.

We would propose that the minor in the College of Engineering be adapted to better fulfill the needs of CAS students. This opportunity would allow students to gain knowledge from an established curriculum while also exploring discipline-specific entrepreneurial approaches. A proposed collaborative minor would include 9 credits of courses throughout the campus, such as a selection of those prescribed for the Engineering Entrepreneurship minor, with the remaining 9 credits obtained in the student's discipline.

We also see opportunities for future collaboration with the Smeal College as well as other Penn State entities such as ENRI, PSIEE, the Goddard Chair, etc.

Potential External Groups for Collaboration

- Pennsylvania Small Business Development Centers
- Ben Franklin Partnership
- Ag Lenders
- PennTAP
- Pennsylvania Farm Bureau
- Center for Dairy Excellence
- Pennsylvania Department of Agriculture
- Non-Profits
 - Fair Food
 - Farm to City
 - Grow Pittsburgh
 - GreenWorks (Allegheny County)

Examples of Professional Associations

- Pennsylvania Association of Wine Growers
- Pennsylvania Wine Association
- Pennsylvania Forest Products Association
- Pennsylvania Food Processors Association
- Pennsylvania Vegetable Growers Association
- State Horticulture Association of Pennsylvania

Other Universities

- Land Grants across the country
- University of Pittsburgh
- St. Joseph's
- Universities and colleges in foreign countries

#5. CAPITALIZING ON COLLEGE STRENGTHS

The CAS has a number of unique strengths that should encourage us to put a greater emphasis on entrepreneurship. And perhaps just as important, the College is weak in related areas that if strengthened could give significant returns on our investment.

One of our greatest strengths is our relationship with external stakeholders. It would be difficult to quantify the many external stakeholders that trust the College to be their primary source for both technical and business information, but it would be accurate to conclude that no other College at Penn State has a closer relationship with its stakeholders. We are not currently taking full advantage of our strengths related to entrepreneurship, and thus the College is not living up to its potential in this area. As Extension programs and delivery methods are re-invented, it will be important to understand that “one size fits all programming” while economically efficient to deliver, is not going to provide the kind of support Pennsylvania entrepreneurs require. Extension must continue to be engaged in *responsive support* that can be delivered on a one-to-one basis.

Another of our strengths is the technical expertise of the CAS faculty and staff; this is not to be underestimated and is a unique strength in part because nothing else exists in the state that can rival it. We would suggest, however, that the full value of this technical expertise is not being realized because oftentimes inventions or innovations do not make it from laboratory to commercialization.

The College also has unique strengths in the so-called “green tech” areas such as bio-energy, nanotechnology, carbon sequestration, and sustainable building materials. These are areas in which the College and University are putting a great deal of effort, with increasing investment by state and federal governments. While our College may be at the forefront of scientific development of these revolutionary advancements, we are relatively weak at helping both internal personnel and external stakeholders to move the technologies beyond the lab toward commercialization. Our team particularly felt that the College is not taking advantage of the science being developed by the faculty and staff and much more emphasis needs to be put in helping our faculty and staff engage in entrepreneurial activities.

While our resident education efforts will focus on building entrepreneurial capabilities of our students, it can not be forgotten that there are 63,000 farm businesses across the state that could benefit from entrepreneurial training. Our Extension with its resources in every county has the unmatched ability to form the framework to provide entrepreneurial training to this broad audience. Our current programs already include training in Business Management, Marketing, and Local Foods. These programs could easily be expanded to add entrepreneurial training. This is a great opportunity for Cooperative Extension to increase its presence in the state with a whole new thrust.

Another unique resource is the Penn State Master Gardeners program which touches numerous citizens across the state. Entrepreneurship could be introduced into this program as another service provided by the University.

One of the unique attributes of agriculture is that most businesses across the state are family businesses. Putting a major emphasis on family businesses and the role entrepreneurship can play in building these family businesses could be the cornerstone of a whole new program for Cooperative Extension. Our team felt that the College is missing a major opportunity by not putting more emphasis on family business issues.

The College's activities already touch every resident in the state in a number of ways. Adding an entrepreneurial thrust to these activities will only enhance the College's value to the Commonwealth and its citizens.

#6. EMERGING NEEDS AS AREAS FOR FUTURE INVESTMENT

Perhaps the most significant emerging need is the increasing demand from CAS undergraduate and graduate students to gain exposure to entrepreneurship. Some of this demand comes from the students themselves, but potential employers are increasingly seeking employees who have an entrepreneurial mindset.

Further examples of emerging needs include:

Demands for Alternative Methods of Disseminating Entrepreneurship Educational Training within Extension

Evidence suggests that traditional forms of providing educational training, such as classroom-style trainings, are not well-received by clientele. This is particularly true for intensive, possibly multi-session, trainings on topics such as marketing research or business planning, both of which are critical for entrepreneurial success. In spite of this, business owners frequently indicate that management topics are among the most important items on which they'd like to receive training. Therefore, we believe that we must identify new means of providing training if we are to encourage entrepreneurship to clientele. Information technologies provide potentially useful opportunities for doing this. These include online learning modules, podcasts, discussion groups, and other tools.

Demands for Increased Focus on "Leading Edge" Businesses

Leading edge businesses would include those that are highly innovative, are at the forefront of technologies, or are market leaders in their industry. Although the majority of typical agricultural business owners have yet to master fundamentals such as business planning, financial management, and market research, there are many entrepreneurs whose educational needs are well beyond the basics. College programs, including Dairy Alliance, were designed specifically to address the needs of these business owners. However, this type of program has not been widely applied to include firms that are poised to take advantage of the "green revolution" that is driven by environmental concerns and by opportunities in the emerging "green economy". There are also leading nursery owners, farm market operators, wood product manufacturers, and others who demand higher level training. We believe that it is important to provide advanced educational offerings to help these entrepreneurs to grow their businesses.

Demand for Youth Entrepreneurship Programs

Anecdotal evidence suggests that young people are likely to be very interested in learning about business management and entrepreneurial opportunities in agriculture and natural resources. By targeting youth, we also have an opportunity to recruit students into the College. In addition, these individuals will have a strong appreciation for the connection between managerial skills and

business success. There are a number of curricula available to support this type of program. In addition, the Northeast Regional Center for Rural Development is facilitating ongoing discussions between personnel, primarily Extension and resident educators, across the region who have interest in or are currently engaging in youth programming. Thus, there is support for such a program.

Taken together, these emerging needs imply that the College must have some entity to serve as a focal point and be able to coordinate all its entrepreneurship activities.

#7. ACTION PLAN

The following section details our proposed action plan by dividing the plan into several sections. Our primary recommendation is that the College should initiate and adequately fund a new Center for Ag & Natural Resources Entrepreneurship. Details on our concept for the center are found below. We then break the action plans into the categories of Resident Education, Extension, and Research.

We believe that the primary long term goal with respect to this strategic initiative is to develop an international reputation for excellence in Ag & Natural Resources Entrepreneurship. The goal of College leadership should be world domination in the area of agricultural and natural resources entrepreneurship.

First Action: Initiate a new Center for Ag & Natural Resources Entrepreneurship

Immediate: Establish a named Center to be housed in the College of Agricultural Sciences. The primary thrusts of the center would be to:

- (1) coordinate and enhance CAS entrepreneurship activities in the three areas of resident education, Extension, and research,
- (2) to provide leadership to increase the visibility of our entrepreneurial capabilities to university, state, and external stakeholders,
- (3) identify opportunities for students in agricultural and natural resources majors and minors to interact with successful entrepreneurs, and
- (4) serve as a resource to such groups as ENRI and PSIEE to help their experts take advantage of the rapidly growing marketplace for solutions to environmental challenges.

The Center could be modeled after ENRI or other similar successful centers housed at Penn State or elsewhere.

Proposed Management Structure

- Managing Director – (to be named): This would be a senior, tenured faculty member who would oversee activities of the center and be charged with its initiation during the center's first year of operation. Focus would be on meeting immediate objectives and setting long-term goals and direction.
- Assistant Director for Extension: We propose utilizing Dr. Jeff Hyde in this position given his current title of "State Program Leader for Entrepreneur and Value-Added Agricultural Systems."
- Assistant Director: We propose utilizing Dr. Mark Gagnon to play a key role in the research and education portions of the center.
- Staff assistant funded by the College

One of the first tasks for the Director would be to appoint an advisory committee that would assist with determining long-term objectives for the center.

Immediate Funding needs (year 1):

- Managing Director: ~\$30,000 - 40,000 as incentive funding to cover up to half of the director's time
- Half time Staff Assistant: ~\$20,000 (salary + benefits)
- First year Operating Funds for Center: \$10,000-20,000
 - Travel, communications, etc.

* A portion of the immediate funding needs could come from a partnership with such existing groups as ENRI and PSIEE. The center's goal would be to work closely with these two groups to apply business and entrepreneurial concepts to the environmental initiatives fostered under the auspices of ENRI and PSIEE.

* Dr. Gagnon's funding is covered under a USDA Special Grant (2 yrs) with CAS funds being used to support his teaching role.

Longer term (year 2+):

We suggest hiring an executive director to help lead the center. This could be an endowed, non-tenure track position for someone with expertise in Entrepreneurship and significant industry experience. The center's leadership would partner with the CAS Development Office (Mark Shearer) to seek endowments to fund the center and the Director's chair.

Longer Term Funding needs:

- Salary for Executive Director: \$150,000-200,000 (including benefits)
- Salary for full-time staff assistant (~ \$40,000/yr)

Second Action:

Immediate: Beginning Fall 2009 the College should fully utilize the Harbaugh Endowment for Entrepreneurship to begin hosting bi-annual seminars on entrepreneurship. The Director of the center would be charged with overseeing this action.

- establish a Speaker Series that could be partially funded by this endowment and co-managed by new Student Entrepreneurship Club.

Further, we are proposing action items related to Resident Education, Extension, and Research:

Resident Education Action Items

a. CAS Faculty to Teach Course(s) in Entrepreneurship via Minor (Spring '10)

The College should put resources behind a CAS faculty teaching one or more sections of ENGR 310 or ENGR 411 to give our students adequate opportunities to take these key courses. This course of action has already been approved by the Engineering Entrepreneurship Minor, and a candidate has been tentatively hired on a special USDA grant. Dr. Mark Gagnon will teach ENGR 310 in Spring 2010.

b. Promote Entrepreneurship education within CAS Units and to CAS students (Fall '09)

- i. Add existing Entrepreneurship classes (e.g., ENGR 310, 411) as electives in appropriate CAS majors.
- ii. Modify appropriate existing CAS 300-400 level classes to emphasize entrepreneurial principles.
- iii. Modify existing Ag 150s course to introduce entrepreneurial principles to all CAS students
- iv. Use office of the Associate Dean for Education to encourage Entrepreneurship education

Our team sent a memo to the Associate Dean for Undergraduate Education describing two approaches for incorporating entrepreneurship into the college's undergraduate curriculum, mainly: a) exposing agricultural sciences students to entrepreneurship courses currently offered in other colleges and b) the possibility of developing a minor in entrepreneurship within the College of Agricultural Sciences. At the time that the memo was written, the committee asked for Dr. Fernandez's assistance with informing undergraduate advisors about the opportunity for students to enroll in ENGR 411 (Entrepreneurship Business Basics) for fall 2009 and ENGR 310 (Entrepreneurial Leadership) for spring 2010 and to pursue the College of Engineering's entrepreneurship minor.

Instructors who teach relevant courses should become familiar with content presented in ENGR 310 and 411 and incorporate appropriate content into their respective offerings. Once a College role in delivery of

these courses is established, CAS should seek cross-listing of these courses with AG designations to facilitate CAS student enrollment. Of the various courses offered within the College, entrepreneurial content may more easily be incorporated into capstone courses and existing AG150S courses. The expected outcome for this action is that students will be exposed to entrepreneurial activities, thoughts, and ideas during the initial stage of their college career.

- c. *Initiate Student Entrepreneurship Club (Fall '09)*
Faculty (e.g., Jeff Hyde, Troy Ott) would oversee the development of an undergraduate entrepreneurship club where students would be able to network with each other, faculty, and established entrepreneurs; be able to attend presentations delivered by speakers who inspire others to pursue entrepreneurial activities; participate in tours at facilities owned and operated by entrepreneurs to allow students to observe the actual operations; and have the potential to participate in regional and national conferences and competitions (e.g., idea pitch, business plan) to showcase collaborative entrepreneurial activities. This activity could be combined with internship/externship opportunities specifically targeting members of the student entrepreneurship organization.

- d. *Develop New Graduate Level Entrepreneurship Seminar (Fall 2010)*
The College has a large number of graduate students who are being trained as scientists, and will get jobs with for-profit organizations, but would benefit from an exposure to entrepreneurship. Many of them are working with technologies and innovations that could be commercialized with significant economic impact. We propose creation of a graduate level seminar to introduce entrepreneurship to our graduate students. Successful entrepreneurs would serve as lecturers and mentors with the task of inspiring students to be entrepreneurial. The goal would not be to make the graduate students into entrepreneurs upon graduating. Rather the goal is to provide models of success, stimulate thinking, provide relevant resources and inspire people to consider the opportunities. Then, if at some future time, they find they have developed an innovation that is worthy of an entrepreneurial attempt they will have some insights on how to proceed.

- e. Longer Term: Add 3-5 FTE's in key areas related to Entrepreneurship

Extension Action Plan

Entrepreneurship Education: the Role of Cooperative Extension and Outreach

As Penn State's College of Agricultural Sciences launches an entrepreneurship center, education will be a key component of the center's activities. Resident education efforts will focus on building the entrepreneurial capacities of students across all majors in the college. For some, this will culminate in an earned minor in entrepreneurship. However, similar training has not been available for owners and managers of Pennsylvania's nearly 63,000 farm businesses as well as countless businesses that support production of food and fiber in the state. Building entrepreneurial capacity of these individuals and those who are exploring similar business opportunities will be vital for success of the center. Fortunately, Cooperative Extension provides a foundation on which programs can be built to meet these needs. The added benefit of a strong Extension component is that immediate needs are being addressed providing immediate impact in the state.

This section provides an overview of current activities within Cooperative Extension. Additionally, potential new activities are proposed. If enacted, these will link undergraduate and graduate students with real-world entrepreneurs, enriching the learning environment for all.

Current Cooperative Extension Activities

At present, the Agricultural Entrepreneurship Natural Work Group (AE NWG) has developed four Program Teams relevant to entrepreneurship.

- Business Management
- Business Development
- Marketing
- Local Foods

Toward a More Holistic Approach to Extension Training

Because of Reframing, the AE NWG is now well-positioned to serve as the outreach arm of the proposed center. Its suite of programs rivals that offered by any Small Business Development Center and is targeted directly to the food and fiber client. However, there are elements that, if adopted, would strengthen the NWG's ability to provide support to entrepreneurs.

First, educators need to have a formal appointment to support the center. A percentage of their time should be allocated formally to center activities, including educational programs and consultations. They should be evaluated on this portion of their appointment by Center and College administration. While

this might appear to be restrictive, it would actually allow the educators to decline activities that may otherwise demand their attention.

Second, the center should provide a small number of full-time personnel dedicated to one-on-one consultation. The direct impact of this type of activity far outweighs the direct impact of the educational functions. However, the educational function serves a vital role in ‘weeding out’ those who may not be well-suited to pursue their dreams at the present time. Educational programming also provides a valuable promotional opportunity for Extension staff. That is, the one-on-one contacts might never be made in many cases without the client having attended one or more educational programs. Thus, a balanced approach is needed. A few support personnel should be employed to manage cases, shepherding them through the consultation process.

Finally, a mechanism for two-way flow of research information should be implemented. Extension-focused personnel are perfectly suited for providing results of applied research to clients while also sending potential research questions from clients to research faculty and staff. A periodic forum would be useful in connecting the research and Extension functions of the center.

Extension Action Plan

Immediate:

- Bring existing programs and associated curricula into the Center’s educational offerings, thus making the Center the focal point for clientele to interact with the College’s entrepreneurship initiatives
- Identify a set of educators who will be formally assigned to support the Center’s Outreach activities

Longer Term:

- Engage the center’s Outreach team in discussions of applied research.
- Use the Outreach team to connect students with current business owners.

Research Action Items

We believe that training for faculty should be available on topics such as “The path(s) to commercialization of your inventions”. This could be run out of the Office of Technology Transfer (OTT), and could be made mandatory for all new research faculty. It should include components of discovery, documentation, disclosure, patenting, marketing, licensing and commercialization. It should also highlight the importance of self-assessment before research faculty take on the role of business entrepreneur. Not all faculty with great inventions have the skills to lead the commercialization process. The OTT should provide more support to allow faculty to

determine what role they should play in marketing and commercialization of their inventions.

Annual faculty reviews should involve discussions of any discoveries that could lead to innovations/inventions and opportunities for commercialization of their work.

Faculty need tangible evidence that CAS values innovation/patenting activities. One patent can take years of work before it is awarded. There is presently little guidance for how this work is valued in the annual review, tenure and promotion process.

Expose faculty to entrepreneurs and the entrepreneurial endeavor (could be an additional role of the Center). The OTT and CAS should co-sponsor speakers related to the invention-commercialization enterprise. Our committee definitely felt that there should be improved communication between CAS faculty and OTT.

Need to improve the communication between faculty and the OTT during the disclosure process. Once provisional patents are filed, the OTT needs to schedule meetings to discuss and facilitate development of marketing plans for the invention. There should be a reward system in place to recognize faculty activities to patent inventions.

Specific Research Actions:

- Fall 2009: Work with OTT to determine current patent applications (and invention disclosures) in process from CAS faculty. Center personnel would help review these technologies and consider commercialization potentials.
 - Determine if OTT is not providing adequate assistance for CAS faculty
- Fall 2009 – Spring 2010: Create a matrix for the CAS portfolio of innovations currently being developed. Matrix would help to visualize the College's entire portfolio and how it could be optimized.
- **Longer Term:**
 - If Center can take a more dominant role in helping to commercialize innovations then a portion of funds from licensed patents could be given back to Center to help fund its operations.
 - Center could also act as a facilitator to “match” external funding sources with CAS faculty who have innovations with commercialization potential. This would be another opportunity to work with the Smeal College entrepreneurship center, and to follow their model for helping innovative faculty.

#8. INDICATORS OF SUCCESS

Following are examples of how the College could measure the degree of success it has achieved with this initiative:

- Level of awareness of CAS students of entrepreneurship.
- Engagement of students in entrepreneurial education via club membership, etc
- Level to which CAS students endorse the concept of entrepreneurship and are enrolling in entrepreneurship courses
- Number of students enrolled in entrepreneurship minor
- Number of attendees (especially students) at seminars offered
- Offering of successful entrepreneurship seminar series in conjunction with the Harbaugh Endowment
- Degree to which CAS faculty recognize the importance of entrepreneurship in moving their own innovations toward possible commercialization
- Number of faculty who look at their research in terms of possibility of developing an entrepreneurial enterprise
- Awareness of teaching faculty as to the importance of entrepreneurship to business development and the future success of students
- Amount of Development funds raised to support entrepreneurial activities
- Number of former students who engage in entrepreneurial activities after graduation (e.g., start their own businesses)
- Number of new disclosures and patents filed and licensed
- Number of stakeholders seeking Center support for their entrepreneurial activities
- Tangible outcomes derived from College activities that are implemented to improve profitability and sustainability in Pennsylvania agriculture and natural resource enterprises