Memorandum

To: Professor Cohen
From: Brendan Hodgens, Nicolas Marinaro, Amos Han
Subject: Advertising and supporting IDEAL entrepreneurship education at Lafayette College
Date: November 2013 - December 6, 2013

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What

The goal of this project was to make the Entrepreneurship education proposal from the Spring 2013 EGRS (Engineering Studies) Capstone group relevant at Lafayette College (Appendix G). We sought to advertise IDEAL center [The Center for Innovation, Design, Entrepreneurship, And Leadership] entrepreneurship projects through a website and original video. The program will be directed towards students within the fields of engineering, science, management, business, and finance. These students will garner analytical, communication, and management skills that can be applied to future leadership roles within society. Students will engage in action-based project learning experiences that coincide with the values of the IDEAL Center. While last year's Capstone group did an excellent job in proposing an Entrepreneurship minor, we were able refine this study at Lafayette by bringing about a more hands-on approach. The project provided an answer to our group's driving focus, *"What form of entrepreneurship education is best suited Lafayette's campus, via the IDEAL Center?"* The individuals who partake in this education will develop innovative ways of thinking, collaborative communication, and will gain hands on experience within economic settings. The programs we researched eventually had pre-requisites that introduced students to the meaning of business, finance and technological studies. Thus, the future of entrepreneurship education would include a course program that will serve as a reinforcement of the material, providing insight to the topic of Entrepreneurship while giving students the task of leading semester and year-long projects. This will be suited to EGRS and Economic majors but as part of the IDEAL center will encourage multidisciplinary project groups.

Why

Lafayette College is in the midst of constructing the center for Innovation, Design, Entrepreneurship, and Leadership, known as the IDEAL Center. During their career at Lafayette, many engineering students have engaged themselves in business like settings,

whether it be Engineering Economics and Management (EGRS 261), Project Management (CE 331), Engineering Management (EGRS 450), or Construction Management (CE 431), among others. Additional courses such as Introduction to Engineering and Public Policy (EGRS 251), Sustainable Solutions (EGRS 480), and the Capstone Seminar on Engineering and Society (EGRS 451) have equipped students with communication, interaction, and abstract qualities necessary to be successful in the business world. As a result, students who have taken these classes, as well as others interested in entrepreneurship will seek IDEAL projects as a way to foster their overall development as Lafayette students. The EGRS major, for example, can be broken into two separate focuses: engineering policy and engineering management. While engineering policy primarily focuses on energy development, sustainability, and policy making, the latter is structured towards the supervision, financial, and entrepreneurship aspect of engineering. However, the study of entrepreneurship is lacking in relevance to its potential benefits for a student. Research from the Journal of Small Business Management indicates that "small businesses" account for a considerable part of the GDP (Rideout & Gray, 2013). Because Lafayette College offers solely theoretical economic courses, students may not be prepared to contribute to this sector of the economy. Financial, business, marketing and policy principles seem necessary for entrepreneurship success and thus should be offered.

To understand this void, our group sought to examine the primary contexts surrounding the topic. We identified these as political, cultural, and social. As previously stated, the term "small business" has become common place in popular political rhetoric. Culturally, technology has had a heavier impact on business start-ups over the past few decades, especially in regards to social media. Due to the necessity of technological competence for modern start-ups (Miller, 2011) EGRS majors will be vital to each IDEAL project. Socially, the model of the entrepreneur has developed over time. The sole proprietorship model is once again gaining traction and the image of "basement to billionaire" is more present than ever. This can also be attributed to the increasing use of technology by society.

Our research reveals the value of entrepreneurship through meta-data analysis (Martin, 2013) and espouses project-based (Okudan, 2006) or action oriented education (Rasmussen and Sorheim, 2006). Entrepreneurship education has proven to prepare students for postgraduate success (Peterman and Kennedy, 2003). We heavily cited work done by Elaine C. Rideout on the economic and societal need for entrepreneurs (Rideout, 2012) as well as the successes of entrepreneurship education (Rideout and Gray, 2013).

Who

Our Capstone team of EGRS seniors is Brendan Hodgens, Amos Han, and Nicolas Marinaro. We focused our project under the guise that any implementation of our ideas will occur within the IDEAL center. Even though our work is moving away from the final form of Gadigians, Schellens & Tofel's Entrepreneurship Minor Proposal, their work came from the same question ("*What form of entrepreneurship is best suited at*

Lafayette, via the IDEAL Center?") and should thus be noted. Our group is further determined to work within the constructs of the IDEAL center.

The constructs, or the contextual realities, of this new and maturing facet of our campus and academic community do not limit entrepreneurship education in any way. In fact it appears to be set up optimally for EGRS students: *"The Center for Innovation, Design, Entrepreneurship, And Leadership (IDEAL) facilitates and supports multidisciplinary initiatives that connect liberal arts perspectives to complex social and technical issues, develop global and multicultural perspectives, and deepen their leadership and collaborative work skills. (ideal.lafayette.edu)"*

In order to best tune our proposal to the IDEAL center we will vet our work through Professor Gamber of the Economics Department of Lafayette College. The IDEAL center currently displays three distinctive learning experiences on its website; certificate programs, co-curricular activities, and IDEAL projects.

Professor Gamber and Professor Nestor of the Electrical and Computer Engineering Department are the co-chairs of the IDEAL center. Professor Gamber was consulted about the project and helped form the future direction of this project.

How

After finalizing the scope of our project, and contacting Professor Gamber, we worked to align entrepreneurship education currently available to EGRS majors and others with the mission of the IDEAL Center. Alignment involved presenting our research in a format that is easily accessible by students, faculty, and community partners looking to participate at the IDEAL center. The extensive website was designed in order to explain our project, spread information about the IDEAL center, inspire action-oriented students, and continue the conversation about the dearth of hands-on experiences at Lafayette College. The website included many links including: a "Home Page" dedicated to our research question, a "How to" page explaining the process for prospective students eager to get involved, an "IDOLS page" full of information gathered from Penn State and NC State's Entrepreneurship programs, and a "Data Page" aimed at collecting opinions from prospective students based on their interpretation of entrepreneurship education, among many others. Of these, include a link to our engaging video presentation, which was constructed to recruit students and educators alike to the center, specifically for the sake of entrepreneurship education. The video outlines our group's primary goal in conducting research, our design's similarities to Penn State and NC State, and why our proposal is suited for Lafayette. For our work and proposal to be easily expanded in the future, a tertiary arm of the presentation came in the form of an executive summary and this memo accessible via the website (idealentrepreneurship.wordpress.com)

As last year's group stated, "The center's design will give students the opportunity to connect liberal arts perspectives to real-world issues, to acquire practical skills for the business world, to develop global and multicultural perspectives in real-

world contexts, and to deepen leadership skills for working collaboratively." Professor Gamber proceeded to state, "We envision the center becoming a central hub for the current multidisciplinary courses and initiatives" (Gadigan, Tofel, and Schellens).

Future Goals

After completing and evaluating our final products, our group identified three goals heading into the future. The first of these relates to the value and importance of the program. We hope the program will provide students with the ability and necessary skills to discover the core values of entrepreneurship education through action-oriented projects. Our second goal relates to the realization of the IDEAL Center. We are hoping that construction of the IDEAL Center will be completed in the near future, giving our program a home to grow and evolve. Lastly, in meeting with Professor Gamber, he expressed the need for entrepreneurship certificates. These will act as an incentive to qualified students who garnered the analytical and intuitive skills of an entrepreneur. In conclusion, our research exposed our group to a deeper meaning of entrepreneurship, previously unbeknownst to us. Working diligently, we discovered that the underlying difference between the concept of a born entrepreneur and a made entrepreneur is entrepreneurship education. Our work espoused project-based education that ultimately answered our question "what form of entrepreneurship is best suited for Lafayette, via the IDEAL Center?"

Worked on and Signed

Brendan Hodgens _____

Amos Han _____

Nicolas Marinaro _____

Appendices:

Appendix A:

Works Cited

Martin, B., McNally, J., & Kay, M. (2013). Examining the formation of human capital in entrepreneurship: A meta-analysis of entrepreneurship education outcomes. *Journal of Business Venturing*, *28*(2), 211-224.

Miller III, T. K., Walsh, S. J., Hollar, S., Rideout, E. C., & Pittman, B. C. (2011). Engineering and innovation: An immersive start-up experience. *Computer*, *44*(4), 38-46. doi: 10.1109/MC.2011.33

Okudan, G., & Rzasa, S. (2006). A project-based approach to entrepreneurial leadership education. *Technovation*, *26*(2), 195-210.

Patzelt, H., & Shepherd, D. A. (2010). Recognizing opportunities for sustainable development. *Entrepreneurship Theory and Practice*, *35*(4), 631-652. doi: 10.1111/j.1540-6520.2010.00386.x

Peterman, N. E. and Kennedy, J. (2003), Enterprise education: Influencing students' perceptions of entrepreneurship. *Entrepreneurship Theory and Practice*, 28: 129–144.

Rasmussen, E., & Sørheim, R. (2006). Action-based entrepreneurship education. *Technovation*, *26*(2), 185-194.

Rideout, E., & Gray, D. (2013). Does entrepreneurship education really work? A review and methodological critique of the empirical literature on the effects of university-based entrepreneurship education. *Journal of Small Business Management*, *51*(3), 329-351.

Rideout, Elaine C. (2012) Bounded rationality and the supply side of entrepreneurship: evaluating technology entrepreneurship education for economic impact. NCSU *Engineering Entrepreneurs Program.*

U.S. Department of State/Bureau of International Information Programs, (n.d.). *Principles of entrepreneurship*. Retrieved from website: www.ait.org.tw/infousa/zhtw/docs/enterp.pdf

Appendix B:

Additional Research Library

Cates, C.; Dansberry, D. (2004). A Professional Ethics Learning Module for Use in Co-operative Education. *Science and Engineering Ethics* 10, *401-407*

Fleischmann, S.T. (2004). Essential Ethics – Embedding Ethics into an Engineering Curriculum. *Science and Engineering Ethics 10, 369-381*

Kelly, W.E. (2012). Academic Advice for Students About Internship Selection. *Journal of Alabama Academy of Science*, 83(1).

Nieusma, D. & Riley, D. (2010) Designs on development: Engineering, globalization, and social justice. *Engineering Studies*, 2(1), 29-59.

Rompelman, O., & De Vries, J. (2002). Practical training and internships in engineering education: Educational goals and assessment. *European Journal of Engineering Education*, *27*(2), 173-180. doi: 10.1080/03043790210129621

Santos, F. M. (2012). A positive theory of social entrepreneurship. *Journal of Business Ethics*,*111*(3), 335-331. doi: 10.1007/s10551-012-1413-4

Smith, K., & Petersen, J. (2006). What is educational entrepreneurship?. *Educational Entrepreneurship: Realities, Challenges, Possibilities,*, Retrieved from http://www.newschools.org/files/EducationalEntrepreneurship.pd

Appendix C:

(Working) Annotated Bibliography

Cates, C.; Dansberry, D. (2004). A Professional Ethics Learning Module for Use in Co-operative Education. *Science and Engineering Ethics **10**, 401-407*

Cates and Dansberry are both part of Division of Professional Practice at University of Cincinnati. Their article cited that that new curriculum would be developed to include a cooperative education (co-op). Such curriculum would allow students to focus their attention on a specific area of learning during a hands-on experience. Students in the College of Engineering are required to complete at least four quarters of co-op experience, whereas a majority of students have six quarters of co-op. A co-op is different than a faculty-led laboratory sessions since students would learn through their co-op employer. Moreover, rather than a large semester project, students would mainly focus on a single topic throughout the term as agreed between students and employers. In planning the new curriculum, the Division of Professional Practice recognized the students' need to learn about professional ethics. This article has a strong and detailed insight on why a co-op curriculum would be important for students. Not only that they could have a smoother learning experience, they could be accustomed to the professional ethics in an office. Furthermore, there is a Professional Ethics Learning Module Process, which is a process of how the co-op learning experience works.

Fleischmann, S.T. (2004). Essential Ethics – Embedding Ethics into an Engineering Curriculum. *Science and Engineering Ethics 10, 369-381*

This article depicted the purpose of teaching ethics at the Padnos School of Engineering (PSE) at Grand Valley State University. Ethical decision-making is crucial to professionalism in engineering. A curriculum approach is under development at PSE and the program design would portray from a successful approach in military schools. Fleischmann taught at the United States Naval Academy, one of the military schools that demonstrated success in developing professionalism while academic disciplines were taught. PSE emulated military schools in creating a mission statement and adopting an Honor Code. Despite the ethics within the curriculum, students do not appear to be finished with working on professionalism. It was mandatory for PSE students to participate in the co-op program. Similar to an internship, students typically would be placed with a company during the summer preceding junior year. This would be followed by alternating full-time work and school semester on a year-round schedule to complete senior year with three semester of work experience. The co-op program would allow students to increase a sense of professionalism as they begin working as engineers. In conclusion, this research shows that learning about ethics can increase professionalism. Moreover, increasing professionalism can mean a greater selection of co-op and employment opportunities in engineering.

Kelly, W.E. (2012). Academic Advice for Students About Internship Selection. *Journal of Alabama Academy of Science*, 83(1).

This article appears to target college students who are looking for internship opportunities. It not only gives students advice on how to choose their internship, it shows in detail in how certain internship positions are different than the others. Students generally seek internships based on their career interests. However, no two internships appear to be the same, even if the work is similar. An example was shown that one internship take on extensive responsibilities while another one do not. Another example is whether the employers allow flexible timing or not. An important thing to consider when selecting an internship is to determine whether the employer would be willing to hire former interns. The main purpose of internships is to provide meaningful educational experience that gives the students opportunities to take a look into certain professions that can only be obtained within the practical environment. As there are several factors to consider when selecting an internship, including travel, cost and whether or not the internship is paid, students are suggested to visit the career services office to discuss the internship opportunities and eventually a full-time job placement. It is crucial for internship-seeking students to read this article. Students seeking internships while earning academic credits or fulfilling a co-op requirement can refer to this article when attempting to make a choice on what they would like to do during their hands-on experience.

Martin, B., McNally, J., & Kay, M. (2013). Examining the formation of human capital in entrepreneurship: A meta-analysis of entrepreneurship education outcomes. *Journal of Business Venturing*, *28*(2), 211-224.

This article provides a quantitative analysis of Entrepreneurship education and training (EET) and its effect on human capital assets. The study also, very importantly, distinguishes between academic entrepreneurship education and training and training-focused EET. This article focuses on human capital theory to measure training methods and predict performance outcomes. This article about entrepreneurial education continues the general support of human capital theory and further investigates entrepreneurial specific education and its positive effects. A quantitative source such as this provides data for a concise presentation (with visuals) designed to defend our proposed Entrepreneurship Minor. The article identifies three potential limitations; lack of methological rigor in all studies, non-randomized control grouping, and solely correcting meta-analysis for sample error.

Miller III, T. K., Walsh, S. J., Hollar, S., Rideout, E. C., & Pittman, B. C. (2011). Engineering and innovation: An immersive start-up experience. *Computer*, *44*(4), 38-46. doi: 10.1109/MC.2011.33

Nieusma, D. & Riley, D. (2010) Designs on development: Engineering, globalization, and social justice. *Engineering Studies*, 2(1), 29-59.

Engineering for development attempts often err in the same way by relying on problematic assumptions relating technology to community. The economic and cultural structures associated with development interventions are either ignored or misinterpreted.

This article provides a participant observation style analysis of two less-than-successful development projects led by engineers in Nicaragua and Sri Lanka. Two case studies, of which the authors participated within themselves, are critiqued for their failures, qualitative impacts, and philosophical suggestions. Neoliberal ideology is discussed in negative terms and the concept of "community capacity building" is espoused in its place. A mostly qualitative analysis such as this provides an argument for the inclusion of anthropology in the EGRS curriculum and the carrying out of hands on development engineering projects during an undergraduate education. This article shames neoliberal ideology and possibly suggests as a group we become proponents of social entrepreneurship models.

Okudan, G., & Rzasa, S. (2006). A project-based approach to entrepreneurial leadership education. *Technovation*, *26*(2), 195-210.

Patzelt, H., & Shepherd, D. A. (2010). Recognizing opportunities for sustainable development. *Entrepreneurship Theory and Practice*, *35*(4), 631-652. doi: 10.1111/j.1540-6520.2010.00386.x

Peterman, N. E. and Kennedy, J. (2003), Enterprise education: Influencing students' perceptions of entrepreneurship. *Entrepreneurship Theory and Practice*, 28: 129–144.

Nicole Peterman and Jessica Kennedy, Australian Policy makers and Professors, examined students participating in an education program relevant to their perceptions of desirability and feasibility of starting a business. Students in the Young Achievement Australia (YAA) enterprise program were examined in pre-test and post-test control groups. At the end of the study, Peterman and Kennedy found that students reported significantly higher perceptions of both capability and desire. The study provided factual evidence that exposure to entrepreneurship education can motivate and increase students' desirability to start a business. The report can be a great foundation for our group's argument regarding the importance of entrepreneurship in education. The YAA would help in conducting our study, as it provides proof that participation in an entrepreneurship program increases individual desire and feasibility to start-up their own future business. One limitation of the Peterman and Kennedy study is that it is not a project or course-based course but rather an experiment. Our study is not conducive to gathering students and performing an experiment.

Rasmussen, E., & Sørheim, R. (2006). Action-based entrepreneurship education. *Technovation*, *26*(2), 185-194.

Rideout, E., & Gray, D. (2013). Does entrepreneurship education really work? A review and methodological critique of the empirical literature on the effects of university-based entrepreneurship education. *Journal of Small Business Management*, *51*(3), 329-351.

Elaine C Rideout is a North Carolina State University Entrepreneurship Program employee working as a Lecturer-adjunct. Denis Gray is the North Carolina State University coordinator the Psychology in the Public Interest Program. Gray's focuses his research on science and technology policy issues. In this special (2013) issue of Small Business Management entrepreneurship education is the focus. A methodological critique is carried out through a review of empirical research done on academic entrepreneurship education. This academic review discusses weaknesses in the study of entrepreneurship education and recommends directions to take for further analysis of researching the outcomes of entrepreneurship education. For our Entrepreneurship Minor proposal we must attempt to include future metrics for the analysis of the effectiveness of this type of education.

Rideout, Elaine C. (2012) Bounded rationality and the supply side of entrepreneurship: evaluating technology entrepreneurship education for economic impact. NCSU *Engineering Entrepreneurs Program.*

Elaine C Rideout is a North Carolina State University Entrepreneurship Program employee working as a Lecturer-adjunct. As part of an economic strategy, governments invest in entrepreneurship education (E-ed) and in order to satisfy the question "is it working" testing the theory behind E-ed's widespread implementation so far is constantly carried out. This working paper is a comprehensive review of the quantitative analyses done thus far and research purposed in measuring differences between alumni who receive and don't receive E-ed. Importantly, a defensible control group is identified and compared to. Contextual variables are tested and previous methodology is questioned in this 2012 paper. Data collection done for research was completed with surveys. The intent of the paper to further justify policies that espouse E-ed meshes perfectly with the goal of our research expanding upon and bolstering the Gadigian, Schellens, and Tofel argument for an Entrepreneurship Minor at Lafayette College. Survey data collection done for this paper may inspire the design of Lafayette-specific research in order to make sure the formation of the Entrepreneurship Minor is based on explicit and implicit community standards and opinions. That is to say, as part of our research, I believe our team should create, distribute, and analyze an opinion survey of Lafayette faculty and students related to an Entrepreneurship Minor at Lafayette College.

Rompelman, O., & De Vries, J. (2002). Practical training and internships in engineering education: Educational goals and assessment. *European Journal of Engineering Education*, *27*(2), 173-180. doi: 10.1080/03043790210129621

Santos, F. M. (2012). A positive theory of social entrepreneurship. *Journal of Business Ethics*,*111*(3), 335-331. doi: 10.1007/s10551-012-1413-4

Smith, K., & Petersen, J. (2006). What is educational entrepreneurship?. *Educational Entrepreneurship: Realities, Challenges, Possibilities,*, Retrieved from http://www.newschools.org/files/EducationalEntrepreneurship.pd

The document identifies two different divisions of entrepreneurship; social entrepreneurs and educational entrepreneurs. It challenges educators to seek opportunity to be successful and to understand this process. Additionally, the document talks about the evolution of entrepreneurship over time. The country's population has skyrocketed, and thus, the public outlook has changed. Students at public high schools are no longer expected to "just get to college" but rather be successful in the real world. This evolution and focus on design can be applied to our research in our attempt to maintain that transition to allow students to succeed after college. This serves as our base argument for incorporating the minor at Lafayette, which we could use as a marketing point to faculty and staff. We want to incorporate a minor that allows students to grow parallel to their interests. One limitation of the document is that it does not offer any case studies from a college or university, but rather charter schools.

U.S. Department of State/Bureau of International Information Programs, (n.d.). *Principles of entrepreneurship*. Retrieved from website: www.ait.org.tw/infousa/zhtw/docs/enterp.pdf

This document focuses primarily on the different principles of entrepreneurship and their relation to individuals coming from different backgrounds. It answers many simple questions, such as "what is an entrepreneurship?" and "why become an entrepreneur?" and then delves into more detailed and complex topics such as "entry strategies for new ventures" and "marketing is selling." The principles of entrepreneurship are vital to understanding key concepts and strategies behind the profession and what it entails. Within the scope of our project, our group must identify, explain, and demonstrate how we plan to incorporate these principles into our proposal. This document can help our group learn key aspects of the profession and what it seeks to accomplish. The document's intended audience does present a limitation. It is suited fo a high school audience, which could present a problem for a college level project. However, the key points of the article can be effective in developing our recruiting strategies.