I. Provisional Thesis

Women are historically under-represented through all stages in the field of engineering, comprising 20.5% of undergraduate enrollment, 22.1% of graduate enrollment, and only 11.1% of the workforce (NSF, 2006). The under-representation of women in engineering has become one of the hottest topics in engineering education, leading many to ask: why are there so few women in engineering? What is it about engineering that attracts those who do enter the discipline? Why do so many women leave? What factors are important in encouraging the satisfaction and retention of women? What can be done to encourage more women into the field?

Numerous researchers have found that females see engineering as a male-dominated field that is typically not friendly to female students and that a female will usually not decide to study engineering on her own (Seymour and Hewitt; Brainard and Carlin). Further studies have also found that females and males choose to pursue engineering education for different reasons: females are more susceptible to societal influences, such as encouragement from a significant figure (a relative or teacher), while males are more likely to opt for a career in engineering due to tinkering experiences, prestige, or money (Seymour and Hewitt; Jawitz and Case; Reed and Case; Dick and Rallis).

Do these differences in reasons also exist when students are choosing to study at a certain engineering institution; that is, are certain characteristics of a particular institution – in this case, Franklin W. Olin College of Engineering – more important to female students than to males? In this project, I will be studying the reasons why males and females decide to attend Olin. I am hypothesizing that the social attributes, such as faculty, students, gender ratio, and social environment, will be cited as important factors encouraging matriculation more often for female than for male students. If these differences do exist, Olin may be able to use this information to

attract even more female students to study engineering. Furthermore, other institutions may be encouraged to enhance aspects of the curriculum or the school itself to interest more female students, increasing the numbers of women in engineering.

II. Disciplinary Analysis

Differences in the choices made by men and women regarding engineering majors and careers have been studied by sociologists, feminists, and educational researchers. These different fields are linked in this case by a common question: why are there so few women in engineering and what can be done about it?

Sociologists point to a few main theories to explain these gender differences. One theory postulates that women and men utilize the brain in different ways; for example, men have much more spatial ability than women, allowing men the advantage in engineering. Another theory points to the influences exerted by family, educators, and society on career and major choices, made by students. Cognitive theories speculate boys and girls learn differently; girls excel more on teams and in cooperative learning environments, leading women to steer away from rigorous, individual engineering curriculums. (Campbell and Clewell). Sociologists also claim differences in skills, preferences, environmental determinants, and experience in college – courses, interactions with professors, mentoring opportunities – may wield a great influence on students who pursue and either stay in or leave engineering.

A notable study regarding students' choice of engineering majors focused on the role of the undergraduate education and collegiate environment. Solnick studied how students changed majors over time and how the type of college – private, public, small, large, co-educational, single sex – affected choice. She found women at all-female schools were more likely to participate in fields, such as engineering, that at co-educational schools would be male-dominated, leading her to speculate the unique academic and cultural environment of an all-female school was responsible for this phenomenon (Solnick).

Research in women's studies falls along more feminist lines, discussing the gendering of some careers, such as teaching and nursing, as more feminine, while others, such as engineering and technology related careers, are seen as masculine. Feminists discuss gender socialization as a reason for the low numbers of women in engineering, speculating parents are more likely to give daughters a doll over a truck, while in schools, teachers have double standards regarding student performance in math, expecting boys to perform much better than girls. A study by Walker interviewing females in a small engineering program discusses constructions of self, masculinity, and femininity in engineering. Walker claims these women are "leaving a traditional feminine identity outside the doors of engineering," to take on the more masculine identity of engineer, going on to speculate this may be a reason for the low numbers of women in engineering: not only are women put off by anticipated hostility and sexism, they are also turned away due to expectations of the male-gendered image and culture of engineering (Walker).

Educational research focusing on the same question has departed from the more theoretical studies of sociology and feminism and attempted to actually provide answers through determining why students chose engineering. Previous studies similar to this one have researched the reasons why students enroll in undergraduate engineering programs by surveying high school and college students in an attempt to discern important factors, attributes, or influences on choice of collegiate major. These in particular align closely with my research intentions: factors and influences on high school students (Dick & Rallis, 1991); exploring reasons for studying engineering (Jawitz & Case, 1998), factors influencing choice of mechanical engineering (Reed & Case, 2002), as well as literature regarding the differences in reasons why women and men choose engineering (Adelman; Seymour & Hewitt).

The most common reason cited by all students was influence from significant people – parents, influential teachers, role models, guidance counselors and advisors, and peers. Having an intrinsic interest in subject material was also listed as an important factor in deciding upon a major (Seymour and Hewitt; Jawitz and Case).

However, it is interesting to note a few of the differences between males and females in choosing to pursue engineering. One in particular deals with the influence wielded by significant individuals upon a student. Females were more likely to take the opinions and preferences of others into consideration, while males were less likely to do this; males also thought more about the practical reasons in choosing a major, such as job security and salary. A female was also more likely to choose engineering if she had a parent in engineering; furthermore, females cited career challenge and variety, altruism, and a sense of social/civic obligation – a desire to give back to the community with an engineering education – as a reason for choosing the major. Men, on the other hand, were more likely to go into engineering because of salary, previous experiences in engineering or tinkering, and having scientific hobbies (Jawitz and Case; Seymour and Hewitt; Dick and Rallis; Reed and Case). These studies indicate that social influences encourage females more strongly to engineering careers than their male counterparts.

The importance of social attributes on influencing women to study engineering can only be loosely related to the importance of social attributes of a school attracting women. A study must be done to move towards validation of this hypothesis because although it is very well understood that women and men go into engineering for different reasons, how well understood are the reasons women and men choose to go to certain schools? To study this, I have based my methods on those typically employed by researchers in the field of education; namely, I will be surveying the student body at Olin College with the responses to be kept strictly confidential. I

came to this decision through the literature review I conducted of other projects that were looking at the same problems. Previous studies have either surveyed students to determine importance of given factors (Dick and Rallis), while others have merely asked a single question: why did you choose to study engineering? (Jawitz and Case; Reed and Case). My survey is based upon both of these, which are detailed in depth in the papers; in the field of educational research, surveying. In my survey, I will list a set of specific to Olin factors and ask open-ended questions. By combining both survey and open-ended question, my queries will hopefully be more effective by covering more ground and providing the students with more opportunity to fully answer questions.

I will also be keeping a journal to consolidate all my ideas and research on the topic. The journal, as well as my continued research into literature will help me to analyze the survey results. I will draw heavily on the research mentioned above that has already studied these as well as others I may find. I will conduct a qualitative analysis of survey data, using literature to support and help me come to conclusions that aligns with what is currently known in the disciplines concerned.

To reinforce the significance of this study, I would like to mention that the idea was conceived many years ago. During a humanities class I took my first year, I was given the chance to study the identity of women in engineering and became enthralled with all I learned. After reading about the experiences of students at engineering schools with fewer women than Olin, I became very aware of the amazing opportunities I had open to me at such an innovative institution with a strong commitment to women in engineering. However, Olin is not so far removed from other engineering institutions. Fewer women apply to Olin than do men; because of a desire on Olin's part to preserve a fairly equal gender ratio, this leads some to say women

have a greater chance of being admitted. This also inspires great debate as to whether female candidates are as well qualified as male candidates. What many don't realize is that females are more self-selecting than males when applying to engineering schools, and thus more likely to be qualified candidates. Without additional facts, some might believe that females at Olin are less qualified to be here than their male counterparts. This is a belief I hope to counter by encouraging more females to apply to Olin, thus providing a more diverse pool of applicants.

Like many studies, the importance of this one in particular lies not in the study as much as in how the concluding information is utilized. The disciplinary deliverable will detail whether certain attributes of Olin College appeal more to females than to males. If there do exist differences, Olin could use this information to specifically target more females in order to increase numbers of applicants who are women, leading to a more diverse pool. The study will also benefits those outside Olin by adding an integral piece to a large body of work and encouraging other engineering programs to look closely at what they have to offer and attract female students. However, whether the information is used to create a new prospectus, redesign the website, or even just spark a lively discussion on campus, having a measure of these issues is critical and will hopefully be resolved through the study.

I. Annotated Bibliography

(2002). Women equal in science and engineering? *Women in Higher Education, 11*(12), 6. A short article discussing the disparities between men and women enrolled in engineering education programs. The article focuses on Southern Methodist University, whose school of engineering has a goal to be the first engineering school in the country to have equal numbers of women and men enrolled in programs. SMU is also spearheading other initiatives to support the fulfillment of their goal. I believe this article is significant to my project because it has pointed out two things: one – that this is an important issue, not just at Olin but in engineering programs nationally; and two – SMU could perhaps be a good place to keep a watch on during my Capstone, maybe even have some correspondence with them. *Women in Higher Education,* however, is not a peer reviewed journal; and it is important to note that this was an article in a journal and not empirical research.

Adelman, C. (1998). Women and men of the engineering path: a model for analyses of undergraduate careers. U.S. Department of Education. This is a study of the paths through higher education for students who initially enrolled or indicated an interest in engineering. Four types of students are identified: thresholders, who never take courses past entry-level; migrants, who switch from engineering to other majors or out of college altogether; completers, who finish engineering degrees; and 2 year only students studying technical courses at community/2 year colleges. The study is important to my Capstone because it provides numerous statistics regarding engineering students, especially entrance, retention, and completion statistics.

Bix, Amy Sue. (2004). From "engineeresses" to "girl engineers" to "good engineers": a history of women's U.S. engineering education. *NWSA Journal, 16(*1), 27-49. This is an

article detailing the history of women in engineering education through the 20th century. The time spans many periods, from World War II through the feminist movement to today, illustrating that despite wide gains in the field, women are still incredibly underrepresented. The article discusses the time period when women were first being admitted to engineering programs (to colleges at all, even) and how tough and difficult this was for these young women. Also challenging was recruitment by companies, who preferred male to female applicants. As more women entered the field, they attempted to lead various efforts – Society of Women Engineers, scholarship help, etc – to help other women starting off in the field. Women in engineering education were also helped out by the 1964 Civil Rights Act and feminist movement. As time passed, engineering became to become slightly friendlier towards women; however, although conditions have improved, many challenges still remain. This will be helpful in my AHS capstone because it provides a very comprehensive overview of women in engineering education in the United States, from before WWII to after the feminist movement. This article will be good guidance when I am drawing up a general timeline of women in engineering education, although I am much more interested in recent events. However, the author appears to be someone who is very interested in the field and open to contact; I am planning on attempting to begin a dialogue with her, as she has other publications focusing on this same topic.

Brainard, S.G. & Carlin, L. (1998). A longitudinal study of undergraduate women in engineering and science. The authors, who are known for studying retention and intervention programs concerning women in engineering, conduct a longitudinal study over six years, tracking undergraduate female students in engineering and science with the hopes of collecting better data on retention and the factors that influence the retention of these students. Persistence

factors, including positive influences of: courses, mentors, advisors, and conferences/event, are identified as important to influencing retention. The study follows both students who remain in science and engineering, as well as those who switch out of these disciplines, comparing the two groups with respect to many parameters, such as GPA and levels of self-confidence. This empirical research project serves as an interesting investigation into what the authors designate persistence and retention factors and is a piece of literature often quoted in women in engineering studies. I think this is important to my study because it identifies the factors that are important in providing a meaningful, productive learning environment for female engineering and science undergraduates.

Campbell, P.B. & Clewell, B.C. (2002). Taking Stock: Where we've been, where we are, and where we're going. ***Journal of Women and Minorities in Science and Engineering, 8,*** **255-284.** The authors, widely known in the field of education, examine the state of women and minorities in science, mathematics, engineering, and technology (SMET) within a chronological context, researching the progress made over the last decade, as well as current status and future directions. The differences between male and females within aspects of SMET disciplines are also discussed, leading to the introduction of four theories: testing-based, biologically-based, social-psychological-based, and cognitively-based. Testing-based theories claim standardized testing may favor one gender over the other; biologically-based theories point to differences in the ways males and females utilize the brain; social-psychological based questions the influence exerted by family, friends, educators, and society on choice of discipline; and finally, cognitively-based theories postulate boys and girls learn differently. The under-representation of women and minorities in SMET fields is further discussed, and methods for achieving gender

parity within these disciplines are suggested. This paper will inform the significance of my project by indicating qualitatively and quantitatively the differences between males and females in SMET/STEM disciplines. An understanding of the theories generally upheld regarding these differences will help point me in the right direction when I go about addressing these differences in researching content for a prospectus.

Catley, Paul C. (2004), Which university? Which course? Undergraduate students' reflections on the factors that influenced their choices. ***Brookes eJournal of Learning and Teaching*****.** <http://www.brookes.ac.uk/publications/bejlt/volume1issue1/practice/catley04.html!> **(cited 26 January 2007).** A study performed by a law professor that looks at both the reasons why undergraduate students chose their program of study and also what resources were important in helping inform these students decisions. This is fabulous because it is very similar to what I am doing. I will read the paper very closely because I believe that it will be helpful when I am trying to write my survey and plan more of the details of my study. I have also attempted to email the author, but I have yet to hear back from him. It will be interesting to speak to him and also important to note the differences between the UK program of study and US. For the most part, however, I will merely be attempting to learn from his methods of study on this project.

Clayton, M. (2000). Engineering 100: No Men Allowed. ***The Christian Science Monitor, 92(*****29), 14-15.** This is a short article about the new engineering program at Smith College, highlighting the hands-on projects and the social relevance of the curriculum. The author interviews Smith students, professors, and the college president regarding this brand new,

innovative engineering program at an all-women's school. Although short, this is another article that is helpful because it introduces Smith as a college to watch, perhaps to learn from and work with also in my Capstone project; again, however, I must note this is merely an article in a magazine, and not an empirically based research project. Still, I can study the program at Smith, compare it to Olin, and observe how Smith recruits women, as well as the caliber of students recruited (into the general college and engineering program) as well as the graduates of such programs. Smith College graduated the first engineering students in 2005, so it would be interesting to even follow up with some of them (who I have contacts with through SWE).

Cuny, J., & Aspray, W. (2000). Recruitment and retention of women graduate students in Computer Science and Engineering. Retrieved March 7, 2007, from http://www.cra.org/reports/r&rwomen.pdf**.** This publication resulted from a workshop, sponsored in part by the NSF, discussing the recruitment and retention of women into Computer Science and Engineering Graduate Programs. A panel of members from academic and research, social scientists, and directors of various Computer science and Engineering programs participated in the workshop. Problems, such as the under-representation of women in CSE graduate programs, as well as recommendations for solutions, are shared. This report is incredibly important for my project because it basically constitutes what I am hoping to do for Admission, on a smaller scale, and provides a great deal of information regarding the under-representation of women in engineering and what we should be doing about it. I will have to be careful to note differences between graduate and undergraduate programs, however, as this is tailored for Computer Science and Engineering graduates. Still, I think I will find many similarities.

Dick, Thomas P., & Rallis, Sharon F. (1991). Factors and Influences on High School Students' Career Choices. ***Journal for Research in Mathematics Education, 22*****(4), 281-292.** This research surveyed seniors in schools across Rhode Island regarding academic and career choices, attempting to determine the most influential factors on students during the high school years. While the researchers found some gender differences regarding men and women students choosing engineering and science careers, they found none among students with strong math and science backgrounds. I think this will be a very interesting paper because it appears to offer a different perspective regarding what Seymour and Hewitt found (their study was conducted between 1987 through 1991 and only published in 1997). Seymour and Hewitt found that yes, gender differences do exist; these researchers found that they did not exist for students who had extensive math and science coursework.

Farrell, E.F. (2002). Engineering a Warmer Welcome for Female Students. ***The Chronicle of Higher Education, XLVII*****(24), 31-36.** The author visits and discusses the new initiatives in engineering programs at RPI, Tufts University, and Smith College. These programs have been shaped by "Engineering Criteria 2000," new accreditation standards that are less rigorous on engineering programs, allowing for more flexibility within specified courses and hours, among other things. These changes were instituted when professionals felt that while graduates had strong technical skills, they lacked "softer skills" such as creative thinking, communication etc. This, along with a new challenge for engineering – to show engineering is socially relevant, not just fun math and science – has been used to tailor new programs that are more attractive to women. In this article, students, professors, and deans are interviewed and illustrate the importance of hands on projects, learning by doing, and social relevance, especially in regards to

enlisting women in engineering. This article will be helpful to my Capstone because it provides a perspective as to why it is important for me to highlight these characteristics of Olin because these appear to be critical aspects to attracting women into engineering education.

Gibbons, Michael T. (2005). The Year in Numbers. *ASEE*. The American Society of Engineering Education (ASEE) is a nonprofit organization committed to improving the education of engineering and engineering technology. The ASEE conducts various surveys over the year to update statistics regarding students and degrees in engineering. This is a quantitative profile of the number of engineering degrees/students according to various characteristics, such as gender and race, and will be used to add to both the context and significant of the study.

Gosink, J. (2001). Women in Engineering. Retrieved March 7, 2007, from http://alum.mit.edu/ne/whatmatters/200104/**.** An editorial written by a alumni of MIT, class of 1962. Describes her experiences being a woman in the field -- she couldn't use her full name and instead used her initial for the first part of her career because she was treated unfairly as a woman. This states that we should have more women in engineering due to fairness, increase in diversity of designs, and also because women may add diversity to engineering. Women add good perspectives and may very well be better leaders than men. Also, for the US to stay competitive in the world, we need to be efficiently using our talents and resources, of which women make up 50%. Although an opinion article, this still does a great job in pointing out a majority of the main arguments supporting the increase of more women in engineering. I'm not sure if this is a great scholarly reference, although Gosink's credentials are impressive, but this article does help identify some of the reasons why my study is important.

Hewitt, N.M. & Seymour, E. (1997). Talking about leaving: why undergraduates leave the sciences. Boulder, CO: Westview Press. The authors conduct an in-depth, qualitative study as to the reasons why undergraduates of different gender, race, culture, and background drop out of STEM majors. The study relies on complete, four-year survey data on undergraduates entering in 1987 and graduating in 1991 (provided by CIRP) to establish obvious patterns of switching, retention, and transferring majors within these disciplines. The two authors further conduct a three-year study interviewing and surveying 335 students regarding experiences at seven four-year institutions, both large, small, public, and private. This study is particularly important because it was the book that first impassioned me about the experience of women and minorities in science, technology, engineering, and mathematics. The excerpts from student interviews within this book are particularly compelling in my study, as are the conclusions drawn by Hewitt and Seymour. For example, the researchers found males are more likely to go into STEM fields for money and other job benefits, while females are more likely to enter the same disciplines if they believe these fields will offer them a chance to "save the world." This concept of "social engineering" also appears in other literature and is just one of the many differing reasons as to why males and females enter undergraduate engineering education. I'll be studying only the engineering responses in depth; however, I will be looking at the other responses as the whole study is particularly comprehensive.

Jackson, Linda A., Gardner, Philip D., & Sullivan, Linda A. (1993). Engineering Persistence: Past, Present, and Future Factors and Gender Differences. *Higher Education, 26(*2), 227-246. This research study focuses on factors that may be related to differences in

levels of persistence in men and women in undergraduate engineering. Past, present, and future factors were identified; the study found overall that grade point average was the most important persistence factor. I believe this is a great paper to read in depth because a lot of literature is introduced and reviewed in the beginning. The results of the study could perhaps help educate me regarding questions that need to be included in my project, such as the importance of grades in determining a student's satisfaction and retention of a major.

Jawitz, J. & Case, J. (1998). Exploring the reasons South African students give for studying engineering. *International Journal of Engineering Education, 14*: 235-240. Jawitz and Case are two faculty members at the University of Cape Town in South Africa who gave engineering students a simple survey: why did you decide to study engineering? The results from this sample fell into the following categories: socializers, career contact, school subject, manual activities, mental activities, challenge and variety, social identity, and career reward. The answers were studied based on gender and race and yielded interesting results regarding the reasons men and women and white students and black students decide to study engineering. Pay, for example, is a much greater factor for men, while social identity and socializers (family, teachers) play a greater role in influencing women. This is important for my study because it is very similar to the survey I hope to send out to the student body at Olin and will be used when I am both writing and analyzing the survey. Again, however, I'll need to consider international differences when reviewing and comparing this paper to my own.

Leslie, L.L, McClure, G.T., & Oaxaca, R.L. (1998). Women and minorities in science and engineering: a life sequence analysis. *The Journal of Higher Education, 69*(3), 239-276. The

authors examine women and minorities in science and engineering, synthesizing the results of previously conducted research. Utilizing data from the CIRP (Cooperative Institutional Research Program), the authors conduct an extensive search into the under-representation of women and minorities, providing startling statistics regarding this topic. The "most powerful concepts" explaining this – self-concept/self-efficacy, peer influence, and goal commitment – are explained in further depth, through previous research and the authors' own testing. Suggestions for moving towards parity in these fields are also discussed briefly. I believe this study is important because it provides a concise summary of a great amount of previous research into the study of women and minorities in science and engineering, which will be good when writing my contextual report.

Morgan, C., Issac, J., & Sansone, C. (2001). The role of interest in understanding the career choices of female and male college students. *Sex Roles*, 44, 295-320. A research project surveyed a number of college students to discern whether work goals and the typical goals achieved in certain careers were linked to how interesting a career in science and mathematics was viewed. All these factors were then analyzed to determine correlation to actual career pursuit in these fields. The researchers found that anticipated interest in careers was incredibly important for both the male and female students. Additionally, women were more drawn to interpersonal work goals while men were more interested in high pay and status. The findings of this study are helpful because they describe the ways students view and decide to pursue science, math, and related fields (engineering) in college.

Moskal, B.M. (2000). Looking to the future: Women in science and engineering. *Frontiers in Education Conference*. Retrieved March 7, 2007, from http://fie.engrng.pitt.edu/fie2000/papers/1516.pdf**.** This report given at the Frontiers in Education Conference, one of the best-known conferences dealing with education, discusses the issues arising from the shortage of engineers in the US. Moskal suggests an increase of women engineers may very well be what the US needs to stay competitive; she also details a variety of other reasons, such as fairness, equity, and higher compensation, as to why there should be more women in engineering. Moskal then goes on to describe some programs at various universities and through certain organizations that seek to address the under-representation of women in engineering. Finally, Moskal identifies certain measures that may be taken, such as outreach programs, to increase the numbers of women in engineering. This research paper will be helpful when I am creating an argument as to why it is important for more women to go into engineering.

Reed, B. & Case, J. (2003). Factors influencing learners' choice of mechanical engineering as a career. *African Journal of Research in SMT Education, 7*:73-83. Reed and Case are another two faculty members at the University of Cape Town in South Africa who gave mechanical engineering students a simple survey: why did you decide to study mechanical engineering? The results from this sample fell into the following categories: exposure to engineering career, socializers, specific career plan, flexibility and challenge, intellectual activities, school subjects, if not, then…, career rewards, physical activities, and social identity. Socializers refer to social influences from a variety of sources; for example, a significant individual encourages the pursuit of engineering or the student believes a career in engineering

will benefit society. The answers were studied based on gender and race and showed, again, social identity factors was the largest difference between males and females. This is important for my study because it is similar enough to my own study so it can help direct me when I am writing my survey and analysis; once again, I must be careful to note international and cultural differences.

Solnick, S. (1995). Changes in women's majors from entrance to graduation at women's and coeducational colleges. *Industrial and Labor Relations Review*, 48,505-514. This study collected data on 1700 students at eight women's colleges and over 800 at seven coeducational colleges to determine the influence of college environment and type on the pursuit of undergraduate careers in traditionally male-dominated fields. The research found women at all-female schools were more likely to participate in male-dominated fields, such as engineering. Reading this was incredibly important and useful for my project because it helped to place my project within a different discipline and also provides a strong argument for what I am seeking – that social influences of the college environment can affect a woman's choice to attend.

Walker, M. (2001). Engineering Identities. *British Journal of Sociology of Education, 22,* 75-89. This study interviewed students at a university in Scotland, attempting to describe constructions of self into masculine and feminine identities in engineering. The paper concludes that although women have made great strides in engineering, gender is still a large concern, and women are often times asked to leave a "traditional feminine identity outside the doors of engineering." I found this work incredibly enlightening as it provided a more sociological and feminist view into the idea of feminine and masculine identities in engineering as well as the

experiences that women expect to have in engineering and why these would discourage women from entering the field. As with the other international studies, I'll be careful to note differences, both relating to culture and location.

Zastavker, Y, Ong, M, & Page, L. (2006). Women in engineering: exploring the effects of project-based learning in a first-year undergraduate engineering program. ***Frontiers in Education Proceedings, 36th Annual Conference*****. Retrieved on March 12, 2007, from:** <http://www.fie.engrng.pitt.edu/fie2006/papers/1385.pdf>**.** This was a study based at a small engineering school with a heavily hands-on, project-based learning curriculum that also utilizes interdisciplinary teaching and integration. The study was performed over two years on first-year students in cohorts of 75 (for a total of 150). The students were both surveyed and qualitatively interviewed to determine the effects of components of project-based learning (small group work, hands-on projects, interdisciplinary teaching) affected students' interest. The study found that project-based learning benefit all students; furthermore, connections between the "real world" and projects served to increase student interest. However, women did indicate a project-based learning curriculum led to greater anxiety, especially regarding working on teams with men and challenging coursework. Overall, project-based learning seems to enhance the undergraduate experience at this college, albeit differently for the two genders.