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Extracurricular College Activities Fostering Students' Innovation Self-efficacy

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Abstract

This study examines the relationship between participation in extracurricular college activities and its possible impact on students' career interests in entrepreneurship and innovation. This work draws from the Engineering Majors Survey (EMS), focusing on *innovation self-efficacy* and how it may be impacted by participation in various extracurricular college activities. The term *self-efficacy* as developed by Albert Bandura is defined as "people's judgment of their capabilities to organize and execute courses of action required to attain designated types of performances" (Bandura, 1986, p.391). Innovation self-efficacy is a variable consisting of six items that correspond to Dyer's five discovery skills seen as important for innovative behavior.

In order to investigate the relationship between participation in certain activities and innovation self-efficacy, the 20 activities identified in the EMS survey were grouped thematically according to their relevance to entrepreneurship-related topics. Students were divided into two groups using K-means cluster analysis according to their innovation self-efficacy (ISE.6) score. Cluster one (C1) contained the students with higher ISE.6 scores, Cluster two (C2) included the students with lower innovation self-efficacy scores. This preliminary research focused on descriptive analyses while also looking at different background characteristics such as gender, academic status and underrepresented minority status (URM).

The results show that students in C1 (high ISE.6) have significantly greater interest in starting an organization (78.1%) in comparison to C2 students (21.9%) (X^2=81.11, p=.000, Cramer's V= .124). At the same time, male students reported significantly higher ISE.6 scores (*M*=66.70, *SD*=17.53) than female students (*M*=66.70, *SD*=17.53) *t*(5192)=-5.220 *p*=.000 and stronger intentions to start an organization than female students (15% and 6.1 % respectively). Cluster affiliation representing innovation self-efficacy as well as gender seems to play a role when looking at career interest in entrepreneurship.

According to Social Cognitive Career Theory, self-efficacy is influenced by learning experiences. In this work activities referring to *hands-on activities in entrepreneurship and innovation* are highly correlated with ISE.6 (r=.206, p=.000), followed by *non-hands-on exposure to entrepreneurship and innovation*. At the same time, students in C1 participated almost twice as often in hands-on activities in entrepreneurship and innovation (28.6%) as compared to students in C2 (15.2%). Interestingly in C1, there were no gender differences in participation in hands-on activities in entrepreneurship and innovation. Overall, female students (*M*=4.66, *SD*=2.5) participated in significantly more activities than male students (*M*=3.9, *SD*=2.64), *t*(5192)=9.65 *p*=.000.

All in all, these results reveal interesting insights into the potential benefits of taking part in innovation and entrepreneurship-related activities and their impact on students' innovation self-efficacy and interests in corresponding careers.

1.0 Introduction

As former U.S. President Barack Obama stated in his speech at Orion Energy Systems in Manitowoc, Wisconsin, innovation and education are driving forces of today's economies and societies (The White House, 2011). In order to promote innovation and entrepreneurship in our economies and in the technical workforce, students need to bring "a broad range of skills and knowledge beyond a strong science and engineering background" (Creed, Suuberg, & Crawford, 2002). The demand for these additional skills has raised questions about the role of higher education in fostering innovation skills and entrepreneurship attitudes amongst students. To address this issue, this research examines a range of learning experiences and their possible impact on students' self-efficacy in innovation and entrepreneurship related self-efficacy. This study considers descriptive statistics to draw a preliminary picture on how the impact of those activities might look like.

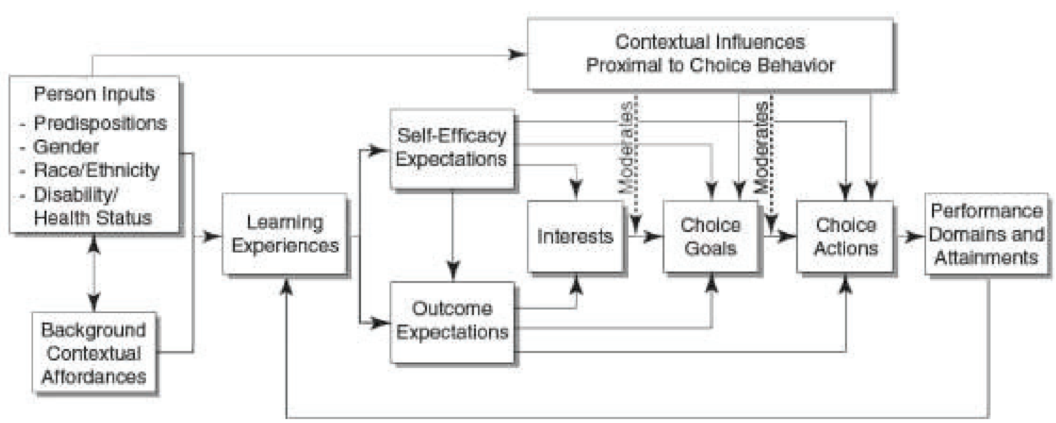
2.0 Background

Choosing and preparing for a career path are tasks most people need to tackle in their professional and personal lives at some point in time whether consciously or unconsciously. Several theories of Career Development, Choice and Adjustment exist. Amongst them is the Social Cognitive Career Theory (Lent, Brown, Hackett, 1994; Lent and Brown, 2006) on which this research is based.

2.1 Social Cognitive Career Theory

The Social Cognitive Career Theory (SCCT) is primarily derived from Bandura's Social Cognitive Theory (SCT) (Bandura, 1986). SCT theory was an early attempt at explaining a person's choices. Later, Lent et al. (1994) adapted and extended this theory to relevant aspects of career development. The framework was conceptualized to be relevant for both academic and career development (Lent et al., 1994). Since "SCCT assumes that people have the capacity to exercise some degree of agency or self-direction" (Lent, Brown, & Hackett, 2002, p.118). Many factors such as environmental supports or barriers influence personal agency in both positive and negative ways. The interactions among the core variables of SCCT, (self-efficacy, outcome expectations and personal goals) are conceptualized to enable the exercise of agency in career development. As the SCCT model shows (see Figure 1), career choice is influenced by a number of factors in addition to the person's interests or personality. Economic, cultural or other conditions sometimes require compromises in making a career choice (Lent et al., 2002, p.124). These additional factors are important to keep in mind even though the current study focuses on single influences of experiences and background characteristics on self-efficacy.

Figure 1: Model of Person, Contextual and Experiential Factors Affecting Career Related Choice Behavior (Copyright 1993 by R.W. Lent, S.D. Brown, and G. Hackett. Reprinted with permission.)



2.2 Bandura's Self-Efficacy Theory

The current study focuses on the interaction between learning experiences and self-efficacy, and more specifically innovation self-efficacy. *Self-efficacy*, as described by Bandura (1997), is a central aspect of Social Cognitive Career Theory and one of two variables of interest in the current research. Self-efficacy is one of the most widely studied components of SCCT in academic contexts (Multon, Brown, Lent, 1991; Lent, Brown, & Larkin, 1984). Self-efficacy is described as "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (Lent, 2006, p.16). Self-efficacy beliefs are assumed to be acquired through four primary informational or learning sources: (a) personal performance accomplishments; (b) vicarious learning; (c) verbal persuasion; and (d) physiological and affective states (Bandura, 1997, p.79). Learning experiences thus play a central role in developing self-efficacy, and are therefore adopted as a focus of this study.

3.0 Research Question

This paper addresses the question of how learning experiences (extracurricular college activities related to innovation and entrepreneurship to be more specific) may be connected to innovation self-efficacy (ISE.6).

4.0 Method

4.1 Engineering Majors Survey

The Engineering Majors Survey (EMS) is a 35-question online survey administered to upwards of 30,000 engineering juniors and seniors in a representative sample of 27 U.S. colleges and universities in 2015. The EMS was part of a broader research effort studying engineering students' interests and career goals related to innovation and entrepreneurship led by National Center for Engineering Pathways to Innovation (Designing Education Lab, 2017). A total of 7,197 students responded to the first deployment of the EMS (EMS 1.0) producing a response rate of about 24 percent. Approximately 30 percent of the respondents were women and 95 percent of them were full-time students (Designing Education Lab, 2017; Gilmartin et al. 2017). After cleaning of the data, the final unweighted dataset for this study consisted of 5,277 students. Cleaning included removing cases without data on the ISE.6 measure, as well as statistical outliers in ISE.6, where outliers were extreme cases that were very different from the other responses. Those cases were identified, i.e., the mean and were detected using the SPSS boxplot function, and excluded in order to avoid any bias in the statistical analyses,

4.2 Innovation Self-Efficacy

The innovation self-efficacy measure consists of six items that correspond to Dyer's five discovery skills, important for innovative behavior: Associating, Questioning, Observing, Experimenting and Networking (Dyer et al., 2011a). The items are shown in Table 1.

Table 1: Mapping of Self-Efficacy Items in the Engineering Majors Survey to Dyer's Discovery Skills

(A) How confident are you in your abilities to each of the following at this time? (Engineering Majors Survey)	B) Corresponding Discovery Skill (Dyer et al., 2011a)
Ask a lot of questions	Questioning
Generate new ideas by observing the world	Observing
Experiment as a way to understand how things work	Experimenting
Actively search for new ideas through experimenting	Experimenting
Build a large network of contacts with whom you can interact to get ideas for new products or services	Networking
Connect concepts and ideas that, at first glance seems to be unconnected	Associating

In this study, the six-item Innovation Self-Efficacy (ISE.6) measure was used. Additional studies stemming from the Engineering Majors Survey research have also used a five item definition of Innovation Self-Efficacy (see Gilmartin et al., 2017). These items were administered on a five-point Likert scale, ranging from *Not confiden*t (0) to *Extremely confident* (4). The Cronbach's alpha for the six items was 0.81 (unweighted). In the survey administration, the order of the items was randomized. The overall Innovation Self-Efficacy variable was represented by taking the average of the six constituent items. In preparing the dataset, the variable scores were converted to a 1-100 range. All statistical assumptions required for parametric testing, such as a normal distribution and linearity, were met.

4.3 Extracurricular Activities

This study focused on the activities in question 12 (Q12) of EMS 1.0 related to extra- and co-curricular college activities. The items in this question were adapted from or informed by other instruments (Designing Education Lab, 2017; Gilmartin et al. 2017). To investigate the influence of different extra- and co-curricular activities, all 20 activities in Q12 an a priori grouping was used based on thematic coding of the activities resulting in four different groups of activities:

(1) Hands-on activities in engineering and design: Hands-on activities represent all activities with a practical component in engineering. Activities normally result in some kind of product or prototype (physical or non-physical).

(2) Hands-on activities in entrepreneurship and innovation: Activities with a practical component in entrepreneurship and innovation. These activities often teach or support the development of either a distinct plan (e.g. business plan) or lead to the actual founding of any kind of organization (e.g. student group, start-up,…) in order to develop and/or promote a new idea.

(3) Non-hands-on activities in entrepreneurship and innovation: Activities that do not include a practical component regarding entrepreneurship and innovation, such as lectures or presentations.

(4) **Activities outside of engineering & entrepreneurship** : Activities that do not explicitly specify an activity in engineering or entrepreneurship such as only referring to engineering in a school context.

All activities with their assigned grouping and participation rates for the sample are shown in Appendix A. To validate the grouping assignment approach, a second independent researcher was also asked to group the activities into the four groups. The second rater received a detailed description of each group (see group descriptions above).. The percent agreement between the two raters was 95 percent, meaning that only one activity was put in a different group by the second rater. The activity was *Lived in a residential or dorm-based engineering program/engineering living-learning community* which was put into group (1) by the second rater. Since engineering was only referred to in a school context in the group descriptions, it was reasonable to add this activity to group (4) as well. The high interrater reliability of .95 validated the a priori grouping approach.

We note that an alternative grouping of the activities was possible using Bandura's four primary informational or learning sources presented in Section 2.2. However, we chose a more pragmatic approach to categorization, one that is likely to be more accessible to both engineering students and faculty considering the types and topic-related activities in this study. Schar et. al. (2017) take this alternate approach.

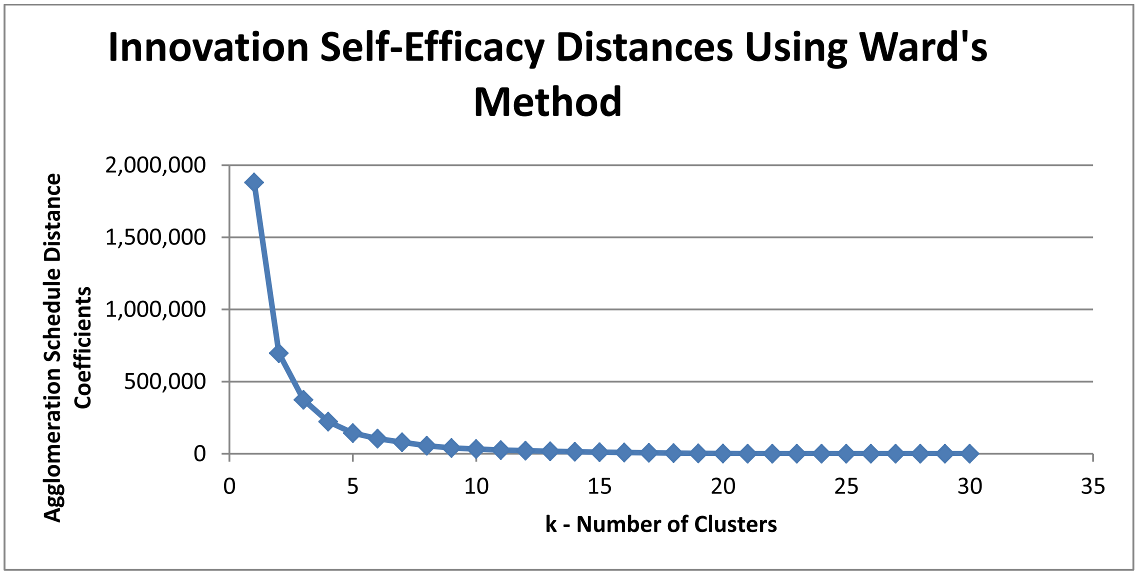
The four most commonly reported activities students participated in were:

- Attended a career related event or meeting (77%)
- Participated in other student clubs or groups in engineering (46%)
- Participated in clubs or groups outside of engineering (45%)
- Attended a speaker series or related presentation about entrepreneurship and innovation (41%)

4.4 Grouping Students

In order to analyze how participation in several activities might be related to students' innovation self-efficacy, students were split into two groups using K-means cluster analysis. The 2-cluster approach presented here (based on only ISE.6) builds on prior work where a 4-cluster approach (based on ISE.6 and another EMS Variable, Career Goals Innovative Work) (Dungs, 2016) was used. In the current research, we focused solely on ISE.6. Before performing the K-means cluster analysis, a hierarchical clustering (Agglomerative using Ward's method) was conducted to determine the optimal number of clusters. Figure 2 shows the distance coefficients according to the number of clusters. The biggest "jump" in distances can be seen between cluster 1 and 2, which is one of the reason why we decided on a 2-cluster solution. A 3- or even 4–cluster solution might be indicated as well, but the 2-cluster solution has the advantage of easier handling due to a fewer number of clusters and retention of the entire sample.

Figure 2: Elbow-Method: Distance Coefficients and Number of Cases Using Ward's Method



The two-cluster solution K-means clustering using ISE.6 as the variable and the full dataset resulted in two groups representing students with high (Cluster 1, C1) and low values in ISE.6 (Cluster 2, C2). Figure 3 shows how the groups are separated along the ISE.6 measure and not differentiated in Career Goals (as in prior work by Dungs, 2016). Statistics on the clusters are shown in Table 2 below:

Figure 3: Scatterplots for Clusters 1 and 2 on the Innovation Self-Efficacy Scale

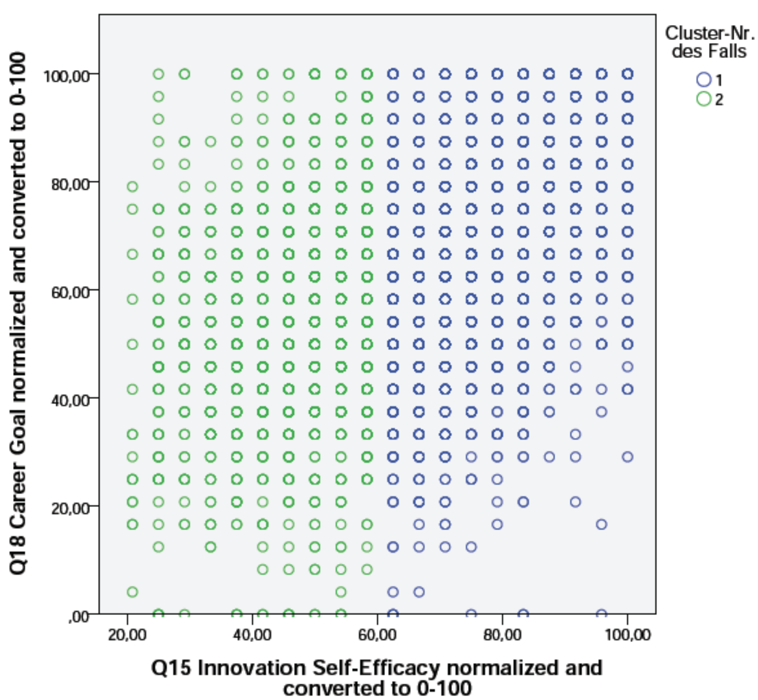


Table 2: Group Statistics for the Innovation Self-Efficacy Clusters

Cluster	C1 (high ISE.6)	C2 (low ISE.6)
Cluster center	79.92	47.72
Minimum (ISE.6)	62.50	20.83
Maximum (ISE.6)	100	58.33
Mean (ISE.6)	76.91	47.72
Std	10.96	9.59
N	3274	2003

Besides using K-means cluster analysis the possibility of using the mean (of ISE.6 and Career Goals) or median was also considered. However, one problem was the question of where to put those students with measures right on the border of each of the two groups; in other words, if using a grouping based on the median, in which group do you put those students with values that are exactly on the median (or mean)? Assigning these into one group or another would substantially change the results. Therefore the clustering using K-means was selected.

In the following sections, the gender, background characteristics and learning experiences of the two groups were analyzed.

5.0 Results

5.1 Demographic Statistics of the Two Groups

Table 3 summarizes the demographic and background characteristics of gender, current academic standing and underrepresented racial/ethnic minority (URM) status for Clusters 1 and 2.

Table 3: Demographic Statistics for Clusters 1 and 2: Gender, Current Academic Standing and URM status

	C1 %	C2 %	X^2	p	Cramer's V(1)
Gender					
Male	64[a]	36[b]	22.077	.000	.065
Female	58[a]	42[b]			
Current academic standing					
Junior	57.4[a]	42.6[b]	40.879	.000	.088
Senior	66[a]	34[b]			
URM status					
URM	65.6[a]	34.4[b]	4.084	.043	.028
Non-URM	61.6[a]	38.4[b]			

[a,b] different subscript letters indicate that column proportions differ significantly at the .05 level
(1) Cramer's V significance levels: *>.10 (weak effect), **>.30 (medium effect), ***>.50 (strong effect)

Looking at the different distributions, one can see that there is a greater percentage of male students in the group with higher ISE.6. However the low Cramer's V of .065 indicates that gender has no statistical effect on Cluster affiliation. Additionally, independent t-tests showed an effect of gender on ISE.6 with all of male students (*M*=66.70, *SD*=17.53) having a significantly higher ISE.6 level than all of the female students (*M*=63.94, *SD*=17.53), *t*(5192)=-5.220 *p*=. 000. That said, the Cohen's d was .15, so gender has, at most, a small effect on ISE.6.

Regarding URM status, t-tests also showed significant differences, URM (*M*=67.19, *SD*=18) students reported higher values than non-URM students (*M*=65.62, *SD*=14.4), *t*(5101)=-2.164 *p*=.030. Given the effect size of .09, it can be ignored. The difference in current academic status is not significant.

Another interesting difference between students with high ISE.6 and lower ISE.6 values is their interest in becoming an entrepreneur, which is represented in the variable "intention to start a company." This variable was created from two items on the EMS survey (Q20) which asked students about their preferences for working in various jobs. The two relevant items were: *found or start your own for-profit organization* and *found or start your own non-profit organization.* Students that marked either *probably will* or *definitely will* in one or both items fell into the group expressing an intention to start an organization. In general, this intention to start an organization is low, with only 12.4 percent (n=652) of the whole sample having marked that they would "probably" or "definitely will" start any kind of company. Some 78 percent of them can be found in Cluster 1 (see Table 4). Concerning gender differences, Table 5 shows that female students report lower intention to start an organization than men (6.1% and 15%, respectively).

Table 4: Intention to Start a For-profit or Non-profit Organization (unweighted) within Intention

	C1 n (%)	C2 n (%)	X^2	p	Cramer's V[(1)]
Intention	509 (78.1)[a]	143 (21.9)[b]	81.11	.000	.124
No intention	2765 (59.8)[a]	1860 (40.2)[b]			

[a,b] different subscript letters indicate that column proportions differ significantly on the .05 level
[(1)] Cramer's V significance levels: *>.10 (weak effect), **>.30 (medium effect), ***>.50 (strong effect)

Table 5: Intention to Start a For-profit or Non-profit Organization (unweighted) within Gender

	Intention	No intention	X^2	p	Cramer's V[(1)]
Male n(%)	562 (15.1)[a]	3169 (84.9)[b]	82.53	.000	.124
Female n(%)	99 (6.1)[a]	1512 (93.9)[b]			

[a,b] different subscript letters indicate that column proportions differ significantly on the .05 level
[(1)] Cramer's V significance levels: *>.10 (weak effect), **>.30 (medium effect), ***>.50 (strong effect)

5.2 Quantity of Activities

Before diving into the different types of activities and their correlations, the quantity of activities students participated in was explored, with the total possible number of activities being 20.An independent t-test showed that students in Cluster 1 (*M*=4.51, *SD*=2.79) participated in significantly more activities than students with lower ISE.6 cluster (C2) (*M*=3.49, *SD*=2.19), *t*(4962)=-14.64 *p*=.000. Further t-tests revealed that female students (*M*=4.66, *SD*=2.5) participated in significantly more activities than male students (*M*=3.9, *SD*=2.64), *t*(5192)=9.65 *p*=.000; with a Cohen's d of .27 this can be considered a small to medium effect.

Also, seniors (*M*=4.39, *SD*=2.7) reported having taken part in more activities than juniors (*M*=3.81, *SD*=2.47), *t*(5257)=8.134 *p*=.000 which can be assumed due to the fact that they are one year ahead in college. No significant difference was found in the quantity of activities students participated in between URM and non-URM students.

5.3 Types of Activities

As explained in Section 4.3, all 20 activities were grouped resulting in four different groups of activities. Table 6 shows the participation rates throughout the four activity groups for the two clusters.

Table 6: Participation in Each Group of Activities within Cluster Groups

	C1 n (%)	C2 n (%)	X^2	p	Cramer's V[(1)]
(1) Hands-on experience in engineering & design	2236[a] (68.3)	1142[b] (57)	68.65	.000	.114
(2) Hands-on experience in entrepreneurship and innovation	935[a] (28.6)	304[b] (15.2)	123.48	.000	.153
(3) Non-hands-on exposure to entrepreneurship and innovation	2100[a] (64.1)	953[b] (47.6)	139.82	.000	.163
(4) Activities outside of engineering & entrepreneurship	2955[a] (90.3)	1766[b] (88.2)	5.75	.016	.033

[a,b] different subscript letters indicate that column proportions differ significantly on the .05 level
[(1)] Cramer's V significance levels: *>.10 (weak effect), **>.30 (medium effect), ***>.50 (strong effect)

Participation in activities outside of engineering and entrepreneurship (which consists of activities that one might expect to be least connected to ISE.6) is consistently high in both of the two clusters (see Table 6). Regarding the other three activity groups, the participation rates differ more significantly, with hands-on experiences in (2) and non-hands-on exposure (3) to entrepreneurship and innovation demonstrating the largest difference between the two groups. This point is reinforced by considering the correlations between involvement in the four categories of activities and ISE.6 (Table 7). We see a stronger connection of *Hands-on experience in entrepreneurship and innovation*, and *Non-hands-on exposure to entrepreneurship and innovation* to ISE.6 that either the Hands-on experiences in engineering and design or Activities outside of engineering.

Table 7: Point-Biserial Correlations between the Participation in Each Type of Activity and Innovation Self-Efficacy

	Pearson's r	p
(1) Hands-on experience in engineering & design	.147	.000
(2) Hands-on experience in entrepreneurship and innovation	.206	.000
(3) Non-hands-on exposure to entrepreneurship and innovation	.205	.000
(4) Activities outside of engineering & entrepreneurship	.045	.001

Table 8: Participation in Activities Considered Hands-on Experiences in Entrepreneurship and Innovation by Gender, Current Academic Status and URM Status

	Male	Female	X²	P	Cramer's V[(1)]
Gender					
C1 %	23.1[a]	24.3[a]	12.9	.002	.05
Current academic standing	**Junior**	**Senior**			
C1 %	21.4[a]	25.3[b]	11.019	.001	.046
URM status	**URM**	**Non-URM**			
C1 %	27.5[a]	23[b]	6.79	.009	.036

[a,b] different subscript letters indicate that column proportions differ significantly on the .05 level
[(1)] Cramer's V significance levels: *>.10 (weak effect), **>.30 (medium effect), ***>.50 (strong effect)

Given that students in Cluster 1 show more involvement (relative to cluster 2) in Hands-on experiences in entrepreneurship and innovation (Table 6), and that this category of activities is most strongly correlated with ISE.6 (Table 7), we considered how activity involvement varies by gender, current academic status, and URM status. As shown in Table 8, there are no statistical differences (when considering Cramer's V values) by these groups.

6.0 Limitations

The current results are affected by the our approach of grouping the students for comparison. There are several alternatives for grouping: for example, grouping by mean, median or cluster analysis. Each way of grouping has its strengths and weaknesses. In this case, cluster analysis was used because it allowed for more flexibility on the "edges" of each group as opposed to the "hard cuts" in grouping by mean or median due to the question of where to put students with values exactly at mean or median. On the other hand, cluster analysis also risks putting students into wrong groups as the "flexible" edges make the clusters not clearly delineated.

Nevertheless, this study provided some interesting preliminary insights into ISE.6 in combination with background characteristics and learning experiences. Many observed differences were found to be significant although with only small effect sizes. This could be interpreted in two ways: First is related to the final unweighted dataset consisting of 5,277 subjects. Such a large sample size might seem to suggest that differences are significant when in fact they are not. The small effect sizes reinforce this explanation. Therefore, the results need to be interpreted carefully. An additional study validating the results might be warranted.

A second explanation for the small effect sizes could be the theoretical framework underlying this research. According to SCCT, a person's self-efficacy and career choice are influenced in multiple ways, not only by one factor. Human behavior is complex. One of those influencing factors is learning experiences and in particular, the extra- and co-curricular experiences in the current study and their temporal relationship to ISE.6. In this research, single time-point correlations were used to describe the relationships between these learning experiences and their influence on ISE.6 because only one time point could be measured in the current

Engineering Majors Survey 1.0. Therefore, inferences about causalities cannot be made at this time. In order to more fully examine whether the investigated activities will increase innovation self-efficacy, a longitudinal study should be considered. Aside from the overall type or topic of the activity, no information about the students' level of engagement, for example, the duration and intensity, was collected. Thus, the current quantitative results need to be interpreted with caution. Further research on this topic is planned with two additional follow-up surveys (EMS 2.0 and 3.0) by the Designing Education Lab research team.

7.0 Conclusions and Implications

All in all, these results show that extra- and co-curricular learning experiences in innovation and entrepreneurship-related topics seem to be beneficial for students' Innovation Self-Efficacy. These results also imply that these activities are beneficial and contribute to students' intentions to start a career in entrepreneurship since the greater part of students' being open to such a career can be found in the group with high ISE.6. Interestingly, activities outsides of engineering or entrepreneurship (e.g. participating in a community service-based club) showed the weakest relationship with ISE.6, raising the question whether those activities are really the least beneficial for the development of ISE.6 or if the observed small effect was in part due to the high participation rates in this type of activity throughout both clusters. However, as only correlations were investigated no conclusion on causal relationships can be made at this point.

These overall results are in line with the findings from Zhao, Seibert, and Hills (2005) who reported that the learning experiences in entrepreneurship were beneficial for a person's entrepreneurial self-efficacy. They also found learning experiences to be more influential than background characteristics such as gender. That there is almost no difference in participation across gender in *Hands-on activities in entrepreneurship and innovation* in this study is interesting as female students were more engaged in activities in total, but at the same time reported lower intention to start an organization as well as lower ISE.6 values. One possible conclusion is that those activities have different effects on male and female students with regard to entrepreneurial intention and their innovation self-efficacy. Overall, the gender difference concerning ISE.6 is arguable with a weak effect size of .15. In order to get clearer results on the cluster differences and the impact of activities on ISE.6, we propose to reanalyze participation rates using another student grouping method, such as comparing two extreme groups (very high measures vs. very low measures). This could result in larger, statistically sufficient results but at the same time may have the disadvantage of leaving out a large number of participants.

8.0 Acknowledgements

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Appendix A

Activity Categorization, by Theme and Type of Activity, N_{total}=5,277

(1) Hands-on Activities in Engineering and Design	**n (%)**
Participated in a design club	540 (10.3)
Entered a design or invention competition	711 (13.6)
Made use of a maker space/design or inventors studio/prototyping lab	1,197 (22.8)
Participated in a robotics club	300 (5.70)
Participated in other student clubs or groups in engineering	2,392 (45.6)
Total Hands-on Experience in Engineering and Design Activities*	3,367 (64.2)
(2) Hands-on Activities in Entrepreneurship & Innovation	**n (%)**
Participated in a business or entrepreneurship club	405 (7.70)
Entered a business plan, business model or elevator pitch competition	272 (5.20)
Attended a start-up bootcamp	130 (2.50)
Received funding from a program to finance new ideas	310 (5.90)
Started or co-founded your own for profit or non-profit organization	137 (2.60)
Started or co-founded a student club or other student groups on campus	478 (9.10)
Entered a social entrepreneurship/social innovation competition	119 (2.30)
Total Hands-on Experience in Entrepreneurship & Innovation *	1,235 (23.50)
(3) Non-hands-on Activities in Entrepreneurship & Innovation	**n (%)**
Attended a speaker series or related presentation about entrepreneurship & innovation	2,158 (41.10)
Attended a presentation on a new engineering technology, process or design (outside of class)	1934 (36.9)
Lived in a residential or dorm-based entrepreneurship or innovation program/entrepreneurship or innovation living-learning community	94 (1.80)
Total Non Hands-on Activities in Entrepreneurship & Innovation*	3,049 (58.10)
(4) Activities Outside of Engineering & Entrepreneurship	**n (%)**
Participated in a community service based club	1,312 (25.0)
Participated in clubs or groups outside of engineering	2,361 (45.0)
Led a student organization	1,497 (28.5)
Lived in a residential or dorm-based engineering program/engineering living-learning community)	672 (12.8)
Attended a career related event or meeting	4,034 (76.9)
Total Activities Outside of Engineering & Entrepreneurship*	4,497 (89.5)

* Total number of students participating in one or more activities in the corresponding activity group