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The Formulation of Entrepreneurial Intentions: A Study of Perceptions, Competencies and Intentions of Higher Education Students in Puerto Rico



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*The Formulation of Entrepreneurial
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*The Formulation of Entrepreneurial Intentions: A Study of Perceptions, Competencies and
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12/06/2010

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The Formulation of Entrepreneurial Intentions: A Study of Perceptions, Competencies and Intentions of Higher Education Students in Puerto Rico

Abstract

The purpose of the study is to reveal the current status of elements associated to entrepreneurial activity in IHEs by examining the attitudes/perceptions, competencies and entrepreneurial intentions of students enrolled in Higher Education institutions in Puerto Rico. A survey measuring attitudes, entrepreneurial intentions and competence levels was administered to a sample of 236 undergraduate students facing an immediate career choice (graduated by June 2009). The surveys were administered via telephone. The results were summarized using descriptive statistics such as means, frequencies, percentages and standard deviations. Inferential statistics such as Analysis of Variance (ANOVA) were used to analyze the relationships between variables. The results obtained from descriptive and inferential statistics provide the baseline to establish context specific infrastructure that promote entrepreneurship and economic development through education. More specifically by examining entrepreneurial intentions, the future entrepreneurial potential was estimated since intention is the best predictor of behavior; assessing attitudes/perceptions increases understanding of the factors that influence entrepreneurial intentions in order to further influence and spur entrepreneurial behavior; and by measuring the level of entrepreneurial competencies, a curriculum that facilitates the operation of entrepreneurial intentions can be developed. In sum, by systematically examining these factors context specific policy and programmatic initiatives can be developed that will encourage further expansion of a localized entrepreneurial base.

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1. EXECUTIVE SUMMARY

PROJECT SUMMARY

The purpose of the study was to reveal the current status of elements associated to entrepreneurial activity in IHEs by examining the attitudes/perceptions, competencies and entrepreneurial intentions of students enrolled in Institutions of Higher Education in Puerto Rico. A survey measuring attitudes, entrepreneurial intentions and competence levels was administered to a sample of 236 undergraduate students facing an immediate career choice (graduated by June 2009). The surveys were administered via telephone. The results were summarized using descriptive statistics such as means, frequencies, percentages and standard deviations. Inferential statistics such as Analysis of Variance (ANOVA) were used to analyze the relationships between variables. The results obtained from descriptive and inferential statistics provide the baseline to establish context specific infrastructure that promote entrepreneurship and economic development through education. More specifically by examining entrepreneurial intentions, the future entrepreneurial potential was estimated since intention is the best predictor of behavior; assessing attitudes/perceptions increases understanding of the factors that influence entrepreneurial intentions in order to further influence and spur entrepreneurial behavior; and by measuring the level of entrepreneurial competencies, a curriculum that facilitates the operation of entrepreneurial intentions can be developed. In sum, by systematically examining these factors context specific policy and programmatic initiatives can be developed that will encourage further expansion of a localized entrepreneurial base.

BACKGROUND

The Formulation of Entrepreneurial Intentions: A Study of Perceptions, Competencies and Intentions of Higher Education Students in Puerto Rico research project emerged from the request for proposals by the Council of Higher Education of Puerto Rico, Center of Studies and Documentation of Higher Education in Puerto Rico (CEDESP). More specifically, the research project responded to the open research projects and was the first attempt to produce a profile of entrepreneurial attitudes, intentions and competencies of graduates of Institutions in Higher Education. The basis for this project relies on the recognized importance of entrepreneurship in Regional Development. However, transitioning from one economic model (labor) to another (entrepreneurial) requires the radical transformation of institutions supporting the entrepreneurial environment, for both, informal institutions (values, culture and social norms) and formal institutions (policies, laws and support programs). This can be achieved by systematically building an environment that fosters entrepreneurship. Nonetheless, before crafting programmatic initiatives and building the required institutional framework, the current status of the entrepreneurial base needs to be assessed, more specifically potential entrepreneurs, in the present case - university graduates. *This study addresses this issue by examining the attitudes/perceptions, competencies and entrepreneurial intentions of students enrolled in Institutions of Higher Education (IHEs) in Puerto Rico.* Several contributions will be derived from the study: (1) by examining entrepreneurial intentions, the future entrepreneurial potential will be estimated since intention is the best predictor of behavior; (2) assessing attitudes/perceptions, precursors of intentions, increases understanding of this intentional process in order to further influence and spur entrepreneurial behavior; and (3) by assessing the level of entrepreneurial competencies, a curriculum that facilitates the operation of entrepreneurial

intentions will be developed. In sum, by systematically examining these factors, context specific policy and programmatic initiatives can be developed that will encourage further expansion of a localized entrepreneurial base: a new revitalized economic model. The Center of Studies and Documentation of Higher Education in Puerto Rico (CEDESP) provided funding (\$30,200) and support to the principal investigator, Prof. Alizabeth Sánchez López from *Sistema Universitario Ana G. Mendez, Universidad del Turabo*. The research project required participation of *Universidad Interamericana, Universidad de Puerto Rico and Sistema Universitario Ana G. Mendez*. Sample frames of graduates were required to conduct the telephone interviews. CEDESP was indispensable in attaining collaboration of participant universities and obtaining the sample frames required to conduct the study.

PROCESS

The study was conducted from July 2009 - October 2010. The research project examined attitudes/perceptions, competencies and entrepreneurial intentions of students enrolled in IHEs in Puerto Rico, using quantitative methodologies. Results were analyzed and summarized using inferential and descriptive statistics. Secondary sources were employed to develop the data collection instrument. Variables and measurement scales were gathered from the literature for the construction of data collection instruments. The surveys were administered via telephone. Respondents were contacted by phone to encourage participation in the study. An electronic format was developed in order to facilitate data entry during the process of data collection. The sample of the study considered students facing an immediate career choice. More specifically, the sample was drawn from students who obtained their bachelors degree by June 2009 (Academic Year 2008 – 2009). The sample (236) was drawn from the Universidad de Puerto Rico, Universidad Interamericana and Sistema Universitario Ana G. Mendez, since these

represent almost 80% of all graduates. A list of students who graduated by June 2009 (Academic year 2008 - 2009) was requested from the registry offices at participant universities. The sample was stratified by institution where 54 percent of the sample will represent Universidad de Puerto Rico, 19 percent Sistema Universitario Ana G. Mendez, and 27 percent Universidad Interamericana. The study considered graduates from different disciplines, which provided a more complete understanding of the phenomenon under study. Obtaining the lists from registry offices of participating institutions was a key determinant in assuring the methodology proposed in this study. Given that the critical information required from students was subject to specific and distinctive policies placed by every institution, obtaining sample frames became a difficult matter. The PI requested CEDESP endorsement letters at this stage. Meetings with officials were necessary in order to gain commitment for the project. Students were randomly selected and contacted to request participation in the study. Participants were selected using the lists provided by the registry offices. The total of graduates per institution was divided by the required sample (quota) per institution (equivalent 54 percent Universidad de Puerto Rico, 19 percent Sistema Universitario Ana G. Mendez, and 27 percent Universidad Interamericana). A minimum of three call backs was employed for each potential participant. Next in list method was used if no response after three call backs. This procedure was maintained until the required quota per institution is achieved. Although data collection was expected to be initiated during the month of January 2010, it was in March 2010 when we were able to start (due to delays in obtaining sample frames). Telephone interviews were conducted by (3) research assistants and under the supervision of the principal investigator.

FINDINGS, CONCLUSIONS AND RECOMENDATIONS

The results show somewhat positive attitudes towards entrepreneurship, particularly when analyzing desirability perceptions. This suggests that entrepreneurial careers and behaviors are desirable among students. However, most measures of feasibility perceptions (how easy or difficult is the task at hand) were considerably low if compared with desirability measures. In this sense the findings suggest the development of programmatic initiatives that influence feasibility perceptions, in other words, programs that make the task at hand easier. Mentorship programs, resource networks and practical entrepreneurship education are examples of support programs that will help improve feasibility perceptions. When examining socioeconomic conditions and inhibitors, we observed that entrepreneurship is highly valued by Puerto Rico's society. However, lack of initial capital, administrative burdens and initial capital were perceived as top inhibitors of entrepreneurial behavior. In this sense attention must be directed towards these inhibitors since these may strongly influence the feasibility perceptions of individuals. Also results show that respondents have intentions to start businesses. This finding was extremely positive particularly since intentions are the best predictor of behavior. Moreover it suggests the importance of assessing the factors that influence the transition from intentions towards behavior, since several conditions will be required to successfully operate and potentially grow the new start-up. This in turn puts forward an interesting area for future research. However, most graduates did not indicate having intentions of starting a business in the near future (within 3 years after graduation). According to the literature, intentions are the best predictor of behavior; however, as time goes by the link (relationship) among the two becomes weak. Moreover, the analysis shows that risk of failure was higher for potential entrepreneurs (individuals with entrepreneurial intentions), which may be an indication of why

individuals prefer to postpone behavior (intentions in the long term). The examination of entrepreneurial competencies revealed that most competencies are well developed. However, use of influence strategies, problem solving and persistence are less developed. Although the results signal areas of improvement, it is important to notice that these general competencies (associated to entrepreneurial behavior) only represent how individuals address situations and do not represent specific skills or knowledge necessary to operate entrepreneurial intentions. Future research should examine the combination of these competencies with specific knowledge and skills required to start businesses. Moreover research should also focus on exploring the relative importance of each competency at different stages of the entrepreneurial process. The profile showed that individuals who possess intentions of starting businesses have positive attitudes towards entrepreneurship, including positive desirability and feasibility perceptions. Moreover, students that indicated having intentions of starting a business consider entrepreneurship desirable and perceive they have the knowledge and skills to start a business. The above findings are not surprising since they are congruent with the literature on entrepreneurial intentions. In this sense in order to stimulate entrepreneurial intentions it is important to develop programs that make the entrepreneurship desirable and feasible. While entrepreneurial fairs, business plan competitions, entrepreneurship success stories, role models and awareness education are programmatic examples that help improve desirability perceptions, practical entrepreneurship education, mentorship programs and resource networks help improve feasibility perceptions. Competencies such as previous initiative, persistence, knowing, concern for quality, commitment to work, efficiency orientation, self-confidence, persuasion and use of influence strategies seem to stimulate entrepreneurial intentions. This in turn suggests the

importance of developing academic curriculum that incorporates learning goals directed towards improving these competencies among students.

2. INTRODUCTION

For over five decades Puerto Rico's economic model has been sustained by federal and local tax incentives that have stimulated foreign direct investment, mainly from USA companies; exclusive trading agreements between Puerto Rico and USA; and welfare programs that intended to improve socioeconomic conditions of the region. Changes in these previous arrangements have posed several threats to Puerto Rico's economy. These, in addition to challenges posed by a global economy, have resulted in increased unemployment rates. Due to these challenges, economists are in need of a new revitalized economic model. New venture creation (entrepreneurship) from local entrepreneurs has been proposed as an approach to establish this new economic model, specifically for its capacity to create employment and wealth.

A shift from one economic model to another will require the radical transformation of institutions supporting the entrepreneurial environment, for both, informal institutions (values, culture and social norms) and formal institutions (policies, laws and support programs). In Puerto Rico, two changes are required: first, the shift from a culture that values workers to a culture that values entrepreneurs; and, second the shift from dependency to self-sufficiency. In other words, Puerto Rico needs an empowered-entrepreneurial culture. This can be achieved by systematically building an environment that fosters entrepreneurship.

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Before crafting programmatic initiatives and building the required institutional framework, the current status of the entrepreneurial base needs to be assessed, more specifically potential entrepreneurs, in the present case - university students. *This study addresses this issue by examining the attitudes/perceptions, competencies and entrepreneurial intentions of students enrolled in Institutions of Higher Education (IHEs) in Puerto Rico.* Several contributions will be derived from the study: (1) by examining entrepreneurial intentions, the future entrepreneurial potential will be estimated since intention is the best predictor of behavior; (2) assessing attitudes/perceptions, precursors of intentions, increases understanding of this intentional process in order to further influence and spur entrepreneurial behavior; and (3) by assessing the level of entrepreneurial competencies, a curriculum that facilitates the operation of entrepreneurial intentions will be developed. In sum, by systematically examining these factors, context specific policy and programmatic initiatives can be developed that will encourage further expansion of a localized entrepreneurial base: a new revitalized economic model.

3. GOALS AND OBJECTIVES

The discussion in the previous section demonstrates the need of a new revitalized economic model based on the development of a localized entrepreneurial base. According to institutional theorists, this can be achieved by modifying the environment in which entrepreneurship operates. In this view, the behavior of creating new ventures can be induced by the interaction of formal and informal institutions (e.g. culture and policies).

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Education plays a significant role in shaping this environment, as it helps change mental models comprised in the culture by means of educational programs and policies.

The general purpose of the study is to reveal the current status of elements associated to entrepreneurial activity in IHEs by examining the attitudes/perceptions, competencies and entrepreneurial intentions of students enrolled in Higher Education institutions in Puerto Rico. This in turn, provides the baseline to establish context specific infrastructure that promotes entrepreneurship and economic development. In this sense, the findings of the study will help identify the elements that require improvement in order to develop programmatic initiatives specific to the needs of potential entrepreneurs (students).

The specific objectives are:

1. To determine the attitudes/perceptions towards entrepreneurship of students enrolled in IHEs in Puerto Rico.
2. To determine the level of entrepreneurial competencies of students enrolled in IHEs in Puerto Rico.
3. To examine entrepreneurial intentions among students in IHEs in Puerto Rico.
4. To analyze the relationship between entrepreneurial competencies, attitudes/perceptions and intentions of students in IHEs in Puerto Rico.

4. LITERATURE REVIEW

In this section literature relevant to the proposed research study is briefly discussed. First, predominant models on entrepreneurial intentions are presented, which highlight the relations between perceptions, intentions and behavior. Second, a review of entrepreneurial competencies research is presented. Third, using institutional theory, the role of environments in entrepreneurial processes is discussed. Finally, the conceptual model employed in this study is discussed.

3.1. Entrepreneurial Perceptions, Intentions and Behavior

Krueger and Brazael (1994) developed a model of entrepreneurial potential based on the individuals' intentions to create businesses. According to this model, the perceptions of individuals produce a predisposition towards a conduct. This predisposition, influenced by a catalytic event (usually unexpected), drive entrepreneurial intentions. Their model of entrepreneurial potential was derived from the Theory of Rational Behavior (Fishbein and Ajzen, 1975), later modified to the Theory of Planned Behavior (1991), and the Model of Entrepreneurial Event (Shapero, 1982). Both theories basically address the importance of perceptions in human behavior. Moreover, the theories underline the impact of the environment (social norms, policies and other institutions) in shaping perceptions and consequently behavior. In this sense, it is argued that in order to predict behavior one must consider both personal and social factors.

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Intentions are a function of attitudes towards a conduct and subjective norms (Fishbein and Ajzen, 1975). While the first one refers to the beliefs individuals have towards an object based on positive or negative valuations of each belief; subjective norms relate to the beliefs of significant persons in the life of the individual and his/her motivation to satisfy their expectations. In this sense, the latter receives input from the socio-cultural context of the individual. According to the authors, these social factors are even more important contributors as they facilitate or inhibit behavior. Also, these can be modified through adequate social structures. However, noticing that not every behavior is under the individual's power, Ajzen (1991) introduced the concept of perceived control, which considers abilities and resources that may interfere with the operation of intentions.

Shapero (1982) emphasizes the socio-cultural environment in the decision to start a business. Based on the theories of planned behavior he introduces the concepts of desirability perceptions and feasibility perceptions to the study of business creation. Basically, he integrates the attitudes towards a conduct and subjective norms within desirability construct and elements of perceived control within the feasibility construct. Although the theories of planned behavior and Shapero's model of entrepreneurial event do not state the relative importance of these dimensions in the formulation of entrepreneurial intentions, Krueger and Brazael (1994) expose the relative importance of feasibility perceptions in predicting the intention starting a business. For a discussion on competing models of entrepreneurial intentions interested readers are referred to Krueger, Reilly and Carsrud (2000).

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In sum, this review reinforces the importance of perceptions in the formulation of entrepreneurial intentions. Also, it emphasizes the role of the socio-cultural environment in shaping these perceptions and how these can be modified through appropriate social structures. Therefore, it is crucial to modify attitudes to produce the behavioral change needed in Puerto Rico, specifically creating positive attitudes towards entrepreneurship. According to the literature review on entrepreneurial intentions, desirability perceptions and feasibility perceptions need to be influenced. While desirability has to do with whether individuals consider entrepreneurial behaviors attractive (desirable), feasibility is concerned with how easy or hard the task at hand is (feasible). The latter is also congruent with Vesper (1990), who states that individuals must perceive they possess the skills to achieve the task at hand in order to decide to start a business. By assessing the perceptions of potential entrepreneurs, adequate structures can be developed (i.e. educational policies) relevant and specific to society's context.

3.2. Entrepreneurial Competencies

The literature on entrepreneurial competencies focuses on the role entrepreneurs play in successfully operating entrepreneurial intentions. This emphasis on the human factor was supported by Stoner (1987) who indicated that the key distinctive competencies of Small and Medium Enterprises (SMEs) are the experience, knowledge, abilities and skills of the entrepreneur. There are several roles entrepreneurs must adopt: the entrepreneurial function, the managerial function and the technical function (Chandler and Jansen, 1992).

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According to Thompson and Strickland (1989) the entrepreneurial role comprises tasks such as scanning the environment, selecting and evaluating opportunities and formulating strategies. Wheelen and Hunger (1989) argue that the managerial process encompasses activities such as program development, budget preparation, procedures, performance evaluations and other tasks essential to implementing strategy. Finally, the technical-functional role considers entrepreneurs' ability to use the tools, procedures and techniques of a specialized field (Pavett and Lau, 1983).

The competency approach continues to be a popular mean of studying entrepreneurial characteristics. Man, W.Y. et al., (2002) reviewed the literature on entrepreneurial competencies and categorized them in six competency areas: opportunity, relationship, organizing, conceptual, commitment and strategic. All of these are associated to different knowledge, skills, abilities and behaviors.

Although the literature identifies entrepreneurial competencies associated to specific industry sectors and contexts, particularly because of the technical-functional role entrepreneurs' exercise, for the purpose of this study general competencies required by entrepreneurs in several sectors will be considered. In this sense, an argument can be made that although some knowledge, skills, abilities and others are context specific, some are universal. These competencies are: initiative, opportunity seeking, persistence, concern for high quality, commitment, efficiency orientation, systematic planning, problem solving, self-confidence, assertiveness, persuasion, use of influence strategies, monitoring, risk taking and creativity. These competencies are consistent with Man, W.Y. et al., (2002) competency areas and those identified by the Entrepreneurship Development Institute of

India Ahemdabad. Also these entrepreneurial competencies facilitate the two predominant roles individuals must exercise when starting and growing a business, as stated by Chandler and Hanks (1994): the entrepreneurial role and the managerial role.

In sum, each career requires a distinctive set of competencies. This set may be general (universal) or even more specific depending on different contexts (i.e. type of business). Competencies can be defined as a set of knowledge, skills and abilities that equip and aid individuals during the venture process. By assuming this position competencies are distinguished from the more traditional view of personality traits, which assumes entrepreneurs are born rather than made. Recognizing this difference makes entrepreneurship a teachable and learnable behavior and provides important implications for policy makers in the academic arena.

3.3. Environments for Entrepreneurship

According to Vesper (1990) entrepreneurial environments promote opportunity identification and exploitation; stimulate propensity to start businesses; and provide the inputs to develop knowledge, abilities and skills necessary to operate entrepreneurial intentions. Therefore, the role of the environment is very diverse as it can influence intrinsic and extrinsic factors of the entrepreneur. Gnyawaly and Fogel (1994) integrate the environment to each dimension of the venture process proposed by Vesper (1990). According to the authors, macroeconomic policies and procedures such as trading policies, entry barriers, business regulations, among others, can significantly affect opportunity

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exploitation. Moreover, socioeconomic conditions (i.e. attitudes towards entrepreneurship, social norms and values), and assistance programs (i.e. financial and non-financial) can stimulate entrepreneurial behaviors by impacting individuals' propensity (motivation and attitudes) and competencies (know what and know how).

The acknowledged role of entrepreneurial environments has led to an increased interest in assessing the institutions that provide the "rules of the game" (North, 1990). For example, under this view the market becomes an institution where the rules of the game are defined and set. Contrary to other classical economic theories, the institutional school has given great importance to the socio-cultural context where economic decisions are made. This approach observes the economy as a group of entities in evolution, which molds and articulates the new alternatives for resource utilization. According to North (1990), institutions include any form of constraint that human beings devised to shape human interaction. These can be either formal (e.g. political and economic rules, among others), or informal (e.g. codes of conduct, attitudes, values, norms of behavior and culture). The decision to act entrepreneurial (i.e. create a business) will be conditioned by external factors (institutional framework), which in turn could help explain the variability of these practices in different geographical spaces.

Assuming this perspective suggests several policy implications and situates public entities at the core of economic development. More importantly it suggests the importance of determining the current state (needs) of the region, mainly because adjustments to the

entrepreneurial environment structure will vary depending on the situation. For example, governments in countries with low propensity (negative attitudes towards entrepreneurship) and high ability must concentrate their efforts in crafting policies and programs that impact the socioeconomic dimension. The mission will be to introduce entrepreneurial values into the region (i.e. positive attitudes towards the entrepreneurial career). On the other hand, governments in countries with high propensity (positive attitudes toward entrepreneurship) and low ability must focus on developing programs to enhance entrepreneurial capabilities. Creating financial assistance programs in countries with low propensity and low ability would be too risky.

In sum, a clear argument can be made that developing environments that foster entrepreneurship require systematic attention of the elements at play. This proposal addresses this issue by providing an initial assessment of the region's current state in terms of propensity to act (attitudes), abilities (competencies) and entrepreneurial intentions. The current state can be assessed by studying these factors using potential entrepreneurs (university level students).

5. RESEARCH QUESTIONS AND CONCEPTUAL MODEL

A favorable entrepreneurial environment promotes business development, including formation and growth. Individuals will be more likely to start venture processes when the following environmental conditions are met: (1) the entrepreneurship role is

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valued by society (positive attitudes); (2) opportunities, resources and assistance exist; and, (3) there is the required knowledge, skills and abilities. Crafting an institutional environment that fosters entrepreneurship will require systematic analysis of a region's conditions. In this section, the conceptual model of the study is presented, which provides a framework to analyze these conditions. More specifically, the attitudes/perceptions, competencies and entrepreneurial intentions of students enrolled in Institutions of Higher Education in Puerto Rico will be examined. In order to achieve this, the following questions will be answered:

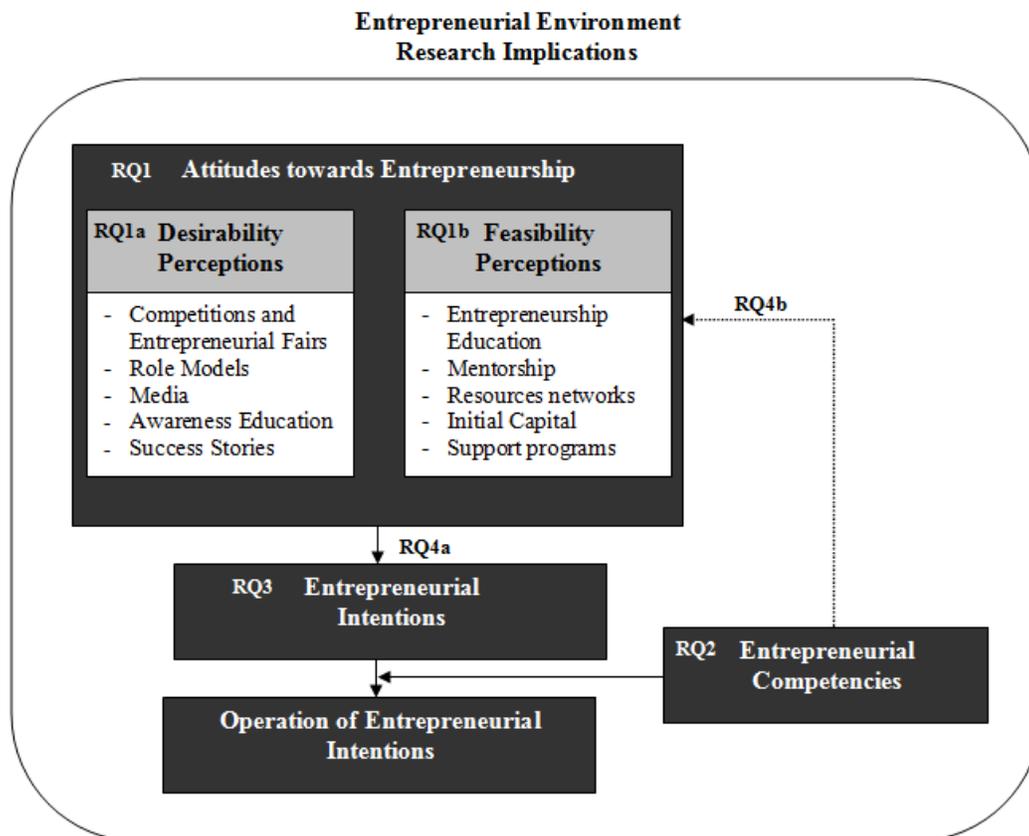
- **RQ1:** What are the attitudes/perceptions towards entrepreneurship of students enrolled in Institutions of Higher Education (IHEs) in Puerto Rico?
- **RQ2:** What is the level of entrepreneurial competencies of students enrolled in IHEs in Puerto Rico?
- **RQ3:** Do students in IHEs in Puerto Rico possess intentions of starting an entrepreneurial career?
- **RQ4:** Is there a relationship between entrepreneurial competencies, attitudes/perceptions and intentions of students in IHEs in Puerto Rico?

The first research question analyzes attitudes towards entrepreneurship. According to the literature review provided in this proposal, entrepreneurship will not prosper if society has negative attitudes towards business creation, as these are necessary conditions in the formulation of entrepreneurial intentions. To build positive attitudes towards entrepreneurship, two types of perceptions need to be altered: desirability perceptions and

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feasibility perceptions. Desirability has to do with whether individuals consider entrepreneurial behaviors attractive (desirable), while feasibility concerns with how easy or hard the task at hand is (feasible). By measuring these two perceptual dimensions, specific programs that influence the dimension in need can be developed, particularly if one is positive while the other is negative. Programs such as entrepreneurial fairs, business plan competitions, entrepreneurship success stories, role models and awareness education are programmatic examples that help improve desirability perceptions. Entrepreneurship education, mentorship programs and resource networks help improve feasibility perceptions.

Figure 1: Conceptual Model of the Study



Source: Developed by the author

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The second research question explores entrepreneurial competencies of students enrolled in IHEs. According to Vesper (1990), low levels of entrepreneurial competencies (knowledge, skills and abilities) could prevent successful operation of entrepreneurial intentions. Without the necessary competencies, nascent and active entrepreneurs will not be able to manage the diversity of problems that emerge during the venture process. By assessing the entrepreneurial competencies of students in IHEs an understanding if educational institutions are playing the required role in the entrepreneurial environment can be achieved. Findings from this question will provide insights that will help improve IHEs role as educators.

Intentions are the best predictor of behavior. Examining entrepreneurial intentions among students in IHEs (potential entrepreneurs) will allow for the provision of an estimation of future entrepreneurial activities. If the findings demonstrate that entrepreneurial intentions are low among students, programs that help increase these must be developed. These can be achieved by modifying the student's desirability and feasibility perceptions. Since the first research question describes these two dimensions, the findings of the study will be able to provide specific programmatic recommendations.

Since the conceptual model has been constructed on theoretical notions, its validity in the specific context under study will be explored. This study also analyzes the relation between entrepreneurial competencies, attitudes/perceptions and intentions due to the aforementioned fact. Overall, the results obtained from the four research questions will

allow drawing conclusions and developing practical implications that will help in the researcher's quest of building an entrepreneurial environment that promotes entrepreneurship.

6. JUSTIFICATION AND POLICY IMPLICATIONS

The findings of the study will provide numerous implications, not only for policy makers, but also for Institutions of Higher Education. The examination of entrepreneurial intentions among students in IHEs (potential entrepreneurs) provides an estimation of future entrepreneurial initiatives. In this sense, if the findings of the study demonstrate that the intentions of creating businesses is low among students at the university level, policy makers will have to develop programs that help increase intentions, and consequently behavior. On the contrary, if intentions are high it will signal that attention must be devoted to developing programs that increase the successful operation of entrepreneurial intentions.

However a question remains: How do policy-makers increase the students' entrepreneurial intentions? According to theories of planned behavior, attitudes/perceptions are important precursors of behavior. Because of this, the perceptions/attitudes of students towards the entrepreneurial career are analyzed. Notice that perceptions are based on individuals beliefs, which do not necessarily represent reality. Due to the above, educational programs can help increase entrepreneurial intentions by

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modifying an individuals' perceptions. More specifically, to create positive attitudes towards entrepreneurship, two types of perceptions need to be altered: desirability perceptions and feasibility perceptions. Desirability has to do with whether individuals consider entrepreneurial behaviors attractive (desirable), while feasibility concerns with how easy or hard the task at hand is (feasible). By measuring these two perceptual dimensions, programs that influence the dimension in need can be developed, particularly if one is positive while the other is negative.

Another concept that requires specific attention is entrepreneurial competencies. Competencies serve dual purposes. Not only does possessing entrepreneurial competencies help potential entrepreneurs (such as students) successfully operate entrepreneurial intentions, but also influence their perceptions (i.e. feasibility perceptions). IHEs play a significant role on this matter, particularly in establishing curriculum that helps develop entrepreneurial competencies. Institutions of Higher Education are already acknowledging this. This can be evidenced by the increases of entrepreneurship courses and curriculums in the past decade. Nonetheless, there is a lack of evidence on whether these initiatives are really helping students develop entrepreneurial competencies. Moreover, entrepreneurship curriculums continue embedded in business administration schools, undermining its potential in other disciplines. By assessing entrepreneurial competencies, recommendations to align the functions of IHEs with the proposed economic model (based on entrepreneurship) can be provided.

7. RESEARCH METHODOLOGY

The purpose of this study is to examine the attitudes/perceptions, competencies and entrepreneurial intentions of students enrolled in IHEs in Puerto Rico by using quantitative methodologies (survey) in order to describe entrepreneurial attitudes, competencies and intentions which may prove to be effective in the short-term in developing new entrepreneurial curriculums. By using inferential statistics, the relationship between attitudes, competencies and was examined in order to legitimize the conceptual model. The study was conducted from July 2009 - October 2010.

Secondary sources were employed to develop the data collection instrument. Variables and measurement scales were gathered from the literature for the construction of data collection instruments. Since the concepts included in the proposed model have been widely studied, no problem will be found in determining measurement scales for each. Moreover, there are entrepreneurial competencies indexes such as the one developed by the Entrepreneurship Development Institute of India Ahemdabad, which encompass most of the competencies cited in the literature. Nonetheless, existing measurement scales will be used as guides when constructing the data collection instrument. A first draft of the data collection tool was sent to experts in the field for revisions and recommendations. Later, the instrument was pretested using a small sample of students in a participant university (Universidad del Turabo). An initial version of the proposed instrument was employed by the author previously in a pilot study within a university campus.

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The surveys were administered via telephone. Respondents were contacted by phone to encourage participation in the study. An electronic format was developed in order to facilitate data entry during the process of data collection. Although at initial stages two data collection modalities were proposed (via telephone and e-mail), qualitative observations from the pilot study suggested to only employ telephone interviews in order to increase response rates. Other issues concerning obtaining samples, information permissible and available in participant institutions also prompted the need to gather responses via telephone.

The sample of the study considers students facing an immediate career choice. More specifically, the sample will be drawn from students who have obtained their bachelors degree by June 2009 (Academic Year 2008 – 2009). According to data provided by CEDESP, 17,070 students obtained a bachelor degree by the end of June 2007. This figure includes private and public Institutions of Higher Education. The following table summarizes the distribution of bachelor degrees by university system.

Table 1: Distribution of Bachelor Degrees by Institution of Higher Education

	# of Degrees	Proportion	Cumulative percentage (%)
UPR	7,165	0.42	42
UIPR	3,615	0.21	63

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	# of Degrees	Proportion	Cumulative percentage (%)
SUAGM	2,555	0.15	78
PUCPR	873	0.05	83
Other Private Institutions	2,733	0.16	99
Other Public Institutions	129	0.01	100
Total	17,070	1.00	

The sample (236) was drawn from the Universidad de Puerto Rico, Universidad Interamericana and Sistema Universitario Ana G. Mendez, since these represent almost 80% of all graduates. Choosing the sample size required interplay between the research objectives and budgetary issues. Cochran (1977) highlights the importance of specifying margins of error for the items that are regarded as most vital to the survey. In this study, the data collection tool comprises both categorical and continuous data. Nonetheless, the most vital dimensions of study are attitudes, competencies and intentions, which are measured as continuous variables (likert scales). The estimated population size based on preliminary data provided by CEDESP is 13,330. According to Bartlett, Kotrlik and Higgins (2001), the minimum sample size for a population size of 10,000, with continuous data is 209 (margin of error = 0.03 and alpha = 0.01). Refer to Appendix 1 for information required of samples based on data type and errors. Appendix 1 also shows that sample size tends to neutralize in populations over 6,000.

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Another objective in sampling design is how to attain a representative sample. In this study, a list of students who graduated by June 2009 (Academic year 2008 - 2009) was requested from the registry offices at the participant universities. The sample was stratified by institution where 54 percent of the sample will represent Universidad de Puerto Rico, 19 percent Sistema Universitario Ana G. Mendez, and 27 percent Universidad Interamericana. The study considered graduates from different disciplines, which provided a more complete understanding of the phenomenon under study.

Lists were requested from all institutions within the following educational systems: Universidad de Puerto Rico, Universidad Interamericana and Sistema Universitario Ana G. Mendez. Special efforts will be directed towards obtaining the lists from Universidad de Puerto Rico (Rio Piedras Campus), Universidad del Turabo and Universidad Interamericana (Metro Campus) since these account for most graduates in each system (33, 38 and 22 percent respectively). The requested lists included the name of the student, faculty and contact information (name, telephone, address). The minimum information required was the name, telephone and address.

Obtaining the lists from registry offices of participating institutions was a key determinant in assuring the methodology proposed in this study. The Family and Educational and Privacy Rights (FERPA) is a Federal law that protects the privacy of student education records. Generally, schools must have written permission from the parent or eligible student in order to release any information from a student's education

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record. However, FERPA allows schools to disclose those records, without consent, to the following parties or under the following conditions (exceptions): school officials with legitimate educational interest; specified officials for audit or evaluation purposes; organizations conducting certain studies for or on behalf of the school; accrediting organizations; among others. Also, schools may disclose, without consent, "directory" information such as a student's name, address, telephone number, date and place of birth, honors and awards, and dates of attendance. Given that the critical information required from students was subject to specific and distinctive policies placed by every institution, obtaining sample frames became a difficult matter. The PI requested CEDESP endorsement letters at this stage. Meetings with officials were necessary in order to gain commitment for the project. Although many efforts were required to accomplish this task, the relevance of the study, protective mechanisms (confidentiality agreements) and potential incentives for collaboration (i.e., reports) allowed obtaining the necessary information. Due to the acknowledged importance of this task lists were requested at early stages of the project.

Students were randomly selected and contacted to request participation in the study. Participants were selected using the lists provided by the registry offices. The total of graduates per institution was divided by the required sample (quota) per institution (equivalent 54 percent Universidad de Puerto Rico, 19 percent Sistema Universitario Ana G. Mendez, and 27 percent Universidad Interamericana). A minimum of three call backs was employed for each potential participant. Next in list method was used if no response

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after three call backs. This procedure was maintained until the required quota per institution is achieved. Although data collection was expected to be initiated during the month of January 2010, it was in March 2010 when we were able to start (due to delays in obtaining sample frames). Telephone interviews were conducted by research assistants and under the supervision of the principal investigator. Two (2) undergraduate students and (1) graduate student were recruited to participate in this research study as research assistants (RAs).

Since data collection was conducted via phone, codification and data entry of the respondents' answers were required. However, the development of an electronic survey allowed us to manage this process more efficiently. These tasks were conducted by the research assistants and under the supervision of the principal investigator. Data analysis was conducted using statistical analysis software, specifically Statistical Package for Social Sciences (SPSS)[®]. The results were summarized using descriptive statistics such as means, frequencies, percentages and standard deviations. Inferential statistics such as Analysis of Variance (ANOVA) were used to analyze the relationships between variables.

8. RESULTS

In this section we discuss the findings (descriptive statistics) of our study pertaining general attitudes/perceptions, competencies and entrepreneurial intentions of students enrolled in Institutions of Higher Education in Puerto Rico. Also we present differences

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among individual (graduates) who possess entrepreneurial intentions and those who do not. This analysis provides a profile of entrepreneurial intentions among IHEs graduates in the Puerto Rico Region.

7.1. Characteristics IHEs Graduates

The following table summarizes descriptive statistics and provides an overview of the characteristics of IHEs graduates in Puerto Rico. Specifically, it shows the percentages in terms of gender, marital status, household income, degree, labor and entrepreneurial status.

Table 1: Characteristics of IHE's Graduates	
Characteristic	Percentage
Gender (N=235)	
Male	32.3
Female	67.7
Marital Status (N=235)	
Single	69.3
Married	30.7
Annual Household Income (N=220)	
Less than \$25,000	52.3
\$25,000 to 49,999	40.9
More than 50,000	6.8

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Table 1: Characteristics of IHE's Graduates

Faculty of Degree (N=232)	
Business Administration	24.6
Natural Sciences	15.5
Education	24.1
Social Sciences and Humanities	15.8
Engineering	4.7
Others	14.7
Work status (N=235)	
Full time employment	39.6
Part time employment	25.1
Self employment	1.7
Not employed	32.7
Entrepreneurial Status (N=235)	
Involved in entrepreneurial activity	12.3
Not involved in entrepreneurial activity	87.7

7.2. Attitudes IHEs Graduates

Using descriptive statistics, Table 2 summarizes the results of desirability and feasibility perceptions and overall attitudes towards entrepreneurship of IHEs graduates. Overall the findings suggest somewhat positive attitudes towards entrepreneurship, particularly when analyzing desirability perceptions. In this sense the findings indicate

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that entrepreneurial careers and behavior are considered desirable among students. Although 33.6 percent of respondents indicated to possess knowledge and skills for starting business, over 80 percent consider the entrepreneurial career desirable and have positive attitudes towards entrepreneurship.

Table 2: Attitudes Toward Entrepreneurship		
Variable	Measurement scale	Percentage
Desirability starting business (N=235)	Yes	88.3
	No	11.7
Desirability career (N=228)	Owner	88.6
	Employee	11.4
Feasibility starting a business (N=225)	Easy	35.6
	Difficult	64.4
Feasibility career (N=235)	Easy to be employee	51.4
	Easy to be entrepreneur	48.6
Feasibility knowledge and skills (N=223)	Yes	33.6
	No	66.4
Overall Attitude (N=234)	Positive	82.9
	Neutral	15.0
	Negative	2.1

7.3. Entrepreneurial Conditions (Environments)

Table 3 shows respondents' perceptions about conditions that inhibit entrepreneurial behavior. Also, it presents an overview of desirability perceptions based on subjective norms, more specifically, how significant individuals in the life of respondents value entrepreneurship. The results provide a picture of specific socio-economic conditions that may affect feasibility perceptions. Based on the findings, economic conditions, the lack of initial capital, administrative burdens in start-up processes and access to credit are the top inhibitors of entrepreneurial behavior.

Table 3: Socio-Economic Facilitating and Inhibiting Conditions			
Desirability Perceptions-Social Norms	Agree	Neutral	Disagree
Regional Attitudes towards Entrepreneurship	75.7	19.2	5.1
Status and Respect towards Entrepreneurship	69	20.5	10.5
Friends Attitudes towards Entrepreneurship	80.7	11.4	7.9
Parents Attitude towards Entrepreneurship	81.1	10.1	8.8
Feasibility Perceptions -Inhibitors			
Economic conditions	86.8	6.4	6.8

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Table 3: Socio-Economic Facilitating and Inhibiting Conditions

Initial capital	91.4	6	2.6
Administrative burdens	88.3	8.2	3.4
Competitors	35.1	15.9	19
Fear of failure	75.9	13.7	10.3
Access to credit	44.6	11.7	4.8
Qualified personnel	23.8	17.4	58.7
Support Programs	53.9	18.3	27.8
Knowledge and Skills	76.9	12.5	11.6
Expert Advice	56.9	16.4	26.7
Risk in the market	72.9	14.4	12.7
Raw materials	42.4	25.8	31.9
Attracting clients	51.4	22.6	26.6
Potential Suppliers	51.3	30.3	18.4
Technology Advances	9.4	9.8	80.9

7.4. Entrepreneurial Competencies

Table 4 shows descriptive statistics for entrepreneurial competencies. It is crucial to notice that these general competencies (associated to entrepreneurial behavior) only represent how individuals address situations and do not represent specific skills or knowledge necessary to operate entrepreneurial intentions. Moreover, the relative

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importance of each is unknown. Nonetheless the results help signal areas that need improvement.

Table 4: Entrepreneurial Competencies

Competencies	Agree	Neutral	Disagree
Initiative	94.4	3	2.3
Sees and Acts on Opportunities	98.3	1.3	.4
Persistence	39.1	20.9	29.4
Knowing	95.3	3	1.7
Concern for High Quality of Work	83	11.9	5.1
Commitment to Work Contract	94.9	3.4	1.7
Efficiency Orientation	90	6.8	2.6
Systematic Planning	88	15.3	5.5
Problem solving	60.8	24.7	14.5
Self-confidence	98.7	.4	.9
Assertiveness	75.4	14	10.6
Persuasion	86.6	12.3	2.1
Use of Influence Strategies	51.5	23.4	25.1

7.5. Entrepreneurial Intentions

The following table (Table 5) shows the results of two measures of entrepreneurial intentions. The first measure asked respondents to indicate if they are considering to start a business after graduating, and the other question asked respondents to indicate the probability of starting a business in the future (using an intention to start scale). The results show that respondents have intentions to start businesses in the future. Although this finding is extremely positive particularly since intentions are the best predictor of behavior, most graduates do not indicate having intentions of starting a business in the near future (within 3 years after graduation). According to the Theory of Planned Behavior (Ajzen, 1991), intentions are the best predictor of behavior but as time goes by the link (relationship) among the two becomes weak. Moreover the findings suggest the importance of assessing the factors that influence the transition from intentions towards behavior, particularly because the intention-behavior relationship is moderated by exogenous factors.

Table 5: Entrepreneurial Intentions		
Variable	Measurement scale	Percentage
Intentions after degree (N=191)	Yes	45.5
	No	54.5
Intentions future (N=235)	Start business	77.4

Table 5: Entrepreneurial Intentions

Unsure	15.3
Not start business	7.2

7.6. Profile of Entrepreneurial Intentions

In this section we provide a profile of entrepreneurial intentions. This analysis allows us to explore which variables are associated to intentions to start a business, as intentions are the best predictor of behavior. Also, since the conceptual model has been constructed on theoretical notions, where attitudes (feasibility and desirability perceptions) influence entrepreneurial intentions, its validity in the specific context under study can be explored.

Based on the results shown in Table 6 individuals that possess intentions of starting businesses have positive attitudes towards entrepreneurship, including positive desirability and feasibility perceptions. This can be observed from the differences in mean values for the variables under the attitude dimension, where the overall attitude is more positive for students with intentions of starting businesses. Moreover, students that indicated having intentions of starting a business considered entrepreneurship desirable, perceived it as a better career choice and considered entrepreneuring feasible. Moreover, competencies such as initiative, knowing, persistence, concern for quality, commitment to contract, efficiency orientation, self-confidence, persuasion and use of influence strategies are

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significantly higher for individuals who possess entrepreneurial intentions. However, the analysis shows that risk of failure may be an impediment for potential entrepreneurs (individual with entrepreneurial intentions), since it was higher for individuals that indicated intentions of starting a business. This in turn, could help explain why intentions to start a business in the long term are higher than intentions of starting a business after graduating.

Table 6: Profile of Entrepreneurial Intentions				
	Possess	Do not possess		
	Entrepreneurial	Entrepreneurial	Total	Sig.
Attitudes/Perceptions	Intentions	Intentions		
Regional Attitude towards Entrepreneurship	4.17	3.8	4.02	.009
Friends Attitudes towards Entrepreneurship	4.36	3.69	4.06	.000.
Parents Attitudes towards Entrepreneurship	4.32	3.72	4.05	.000
Overall Attitude towards Entrepreneurship	4.6	3.8	4.2	.000
Desirability of Starting a Business	100	71	87	.000

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Table 6: Profile of Entrepreneurial Intentions				
	Possess	Do not possess		
	Entrepreneurial	Entrepreneurial	Total	Sig.
	Intentions	Intentions		
Overall Feasibility Starting Business in Puerto Rico	.96	.75	.87	.000
Easy to Start a Business	47 percent	26 percent	37 percent	.004
Easy to Start a Business	47 percent	26 percent	37 percent	.004
Inhibiting Conditions				
Risk of failure	4.26	3.9	4.12	.044
Qualified Personnel	2.22	2.85	2.5	.001
Suppliers	3.2	3.7	3.4	.002
Competencies				
Initiative	4.8	4.5	4.6	.025
Persistence	3.7	2.9	3.3	.00
Knowing	4.7	4.4	4.5	.018
Concern for High Quality of Work	4.4	4.0	4.2	.030
Commitment to Work Contract	4.8	4.5	4.6	.018
Efficiency Orientation	4.6	4.2	4.4	.001
Self-Confidence	4.9	4.7	4.8	.019

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Table 6: Profile of Entrepreneurial Intentions				
	Possess	Do not possess		
	Entrepreneurial Intentions	Entrepreneurial Intentions	Total	Sig.
Persuasion	4.5	4.0	4.2	.00
Use of Influence Strategies	3.5	3.1	3.3	.022

9. CONCLUSIONS AND IMPLICATIONS

The purpose of the study was to assess the current status of the entrepreneurial base by examining the attitudes/perceptions, competencies and entrepreneurial intentions of students enrolled in a Higher Education Institution (IHE) in Puerto Rico. The findings provide several contributions: (1) the examination of entrepreneurial intention allows estimation of future entrepreneurial potential since intention is the best predictor of behavior; (2) the assessment of attitudes/perceptions, precursors of intentions, increases understanding of this intentional process in order to further influence entrepreneurial behavior; (3) measures of level entrepreneurial competencies provide guides to develop curriculums that facilitate the operation of entrepreneurial intentions; and (4) the development of a profile allows evaluation of the theoretical assumptions and provides insights into the factors that influence intentions.

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The results show somewhat positive attitudes towards entrepreneurship, particularly when analyzing desirability perceptions. This suggests that entrepreneurial careers and behaviors are desirable among students. However, most measures of feasibility perceptions (how easy or difficult is the task at hand) were considerably low if compared with desirability measures. In this sense the findings suggest the development of programmatic initiatives that influence feasibility perceptions, in other words, programs that make the task at hand easier. Mentorship programs, resource networks and practical entrepreneurship education are examples of support programs that help improve feasibility perceptions.

When examining socioeconomic conditions and inhibitors, we observed that entrepreneurship is highly valued by Puerto Rico's society. However, lack of initial capital, administrative burdens and initial capital were perceived as top inhibitors of entrepreneurial behavior. In this sense attention must be directed towards these inhibitors since these may strongly influence the feasibility perceptions of individuals.

The results show that respondents have intentions to start businesses. This finding was extremely positive particularly since intentions are the best predictor of behavior. Moreover it suggests the importance of assessing the factors that influence the transition from intentions towards behavior, since several conditions will be required to successfully operate and potentially grow the new start-up. This in turn puts forward an interesting area for future research. However, most graduates did not indicate having intentions of starting

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a business in the near future (within 3 years after graduation). According to the literature, intentions are the best predictor of behavior; however, as time goes by the link (relationship) among the two becomes weak. Moreover, the analysis shows that risk of failure was higher for potential entrepreneurs (individuals with entrepreneurial intentions), which may be an indication of why individuals prefer to postpone behavior (intentions in the long term).

The examination of entrepreneurial competencies revealed that most competencies are well developed. However, use of influence strategies, problem solving and persistence are less developed. Although the results signal areas of improvement, it is important to notice that these general competencies (associated to entrepreneurial behavior) only represent how individuals address situations and do not represent specific skills or knowledge necessary to operate entrepreneurial intentions. Future research should examine the combination of these competencies with specific knowledge and skills required to start businesses. Moreover research should also focus on exploring the relative importance of each competency at different stages of the entrepreneurial process.

The profile showed that individuals who possess intentions of starting businesses have positive attitudes towards entrepreneurship, including positive desirability and feasibility perceptions. Moreover, students that indicated having intentions of starting a business consider entrepreneurship desirable and perceive they have the knowledge and skills to start a business. The above findings are not surprising since they are congruent

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with the literature on entrepreneurial intentions. In this sense in order to stimulate entrepreneurial intentions it is important to develop programs that make the entrepreneurship desirable and feasible. While entrepreneurial fairs, business plan competitions, entrepreneurship success stories, role models and awareness education are programmatic examples that help improve desirability perceptions, practical entrepreneurship education, mentorship programs and resource networks help improve feasibility perceptions.

Finally, competencies such as previous initiative, persistence, knowing, concern for quality, commitment to work, efficiency orientation, self-confidence, persuasion and use of influence strategies seem to stimulate entrepreneurial intentions. This in turn suggests the importance of developing academic curriculum that incorporates learning goals directed towards improving these competencies among students.

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APENDIX 1

**Table for Determining Minimum Returned Sample Size for a Given
Population Size for Continuous and Categorical Data
by Bartlett, Kotrlik and Higgins (2001).**

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Population size	Sample size					
	Continuous data (margin of error = .03)			Categorical data (margin of error = .05)		
	alpha = .10 t = 1.65	alpha = .05 t = 1.96	alpha = .01 t = 2.58	p = .50 t = 1.65	p = .50 t = 1.96	p = .50 t = 2.58
100	46	55	68	74	80	87
200	59	75	102	116	132	154
300	65	85	123	143	169	207
400	69	92	137	162	196	250
500	72	96	147	176	218	286
600	73	100	155	187	235	316
700	75	102	161	196	249	341
800	76	104	166	203	260	363
900	76	105	170	209	270	382
1,000	77	106	173	213	278	399
1,500	79	110	183	230	306	461
2,000	83	112	189	239	323	499
4,000	83	119	198	254	351	570
6,000	83	119	209	259	362	598
8,000	83	119	209	262	367	613
10,000	83	119	209	264	370	623