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The manuscripts contained in this issue were double blind reviewed by the Editorial Board members. Our acceptance rate in this issue conforms to our editorial policy of less than 25%.

Thank you for your interest in The Journal of Entrepreneurship Education.

Ismet Anitsal
Tennessee Tech University

DEVELOPMENT OF VARIOUS TRAINING METHODS FOR ENHANCING THE EFFECTIVENESS AND SKILL DEVELOPMENT AMONG MICRO-ENTREPRENEURS IN INDIA

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ABSTRACT

Microenterprises contribute significantly to the economic growth of a country. But particularly in developing country like India, that is undergoing transition from the traditional sustenance to a modern industrial economy, it plays a crucial role in the economic development. The role played by these microenterprises is immense as they are effective tools for employment generation, sustainable livelihood, contributing to the country's GDP and social upliftment of the society. Further, for the development of microenterprise as an effective tool for employment generation and create sustainable livelihood a proper training methods for micro-entrepreneurial skill development should be developed which will increase the efficiency of the micro-entrepreneurs. The present paper tries to develop a framework for identifying the training methods needed to develop the micro-entrepreneurial skills. Various training methods with its advantages and disadvantages have been given which could be used to upgrade the micro-entrepreneurial skills. It also provides suitable guidelines as to how effective training methods could be designed to facilitate the acquisition of these entrepreneurial skills which will not only create employment generation but also make sustainable livelihood.

Keywords: Micro-entrepreneurs, Training methods, Conceptual framework.

1. INTRODUCTION

The Micro, Small and Medium enterprises (MSMEs) play a pivotal role in the overall economic development of the country. It not only plays a vital role in providing large employment opportunities at comparatively lower capital cost than large industries but also help in the industrialization of rural and backward areas, thereby, reducing regional imbalances. MSMEs are complementary to large industries as supplementary units and contribute enormously to the socio-economic development of the country. MSMEs constitute more than 80% of the total number of industrial enterprises and support industrial development. MSMEs contribute nearly 45% to manufacturing and about 40% to the Indian export sector. Their contribution to the Indian GDP is 8% and the sector has registered a growth rate of 10.8%. (FICCI MSME Summit, 2012). According to the Final Report of the Fourth All India Census of Micro, Small and Medium Enterprises published in 2006-07 of the number of enterprises registered, the number of microenterprises alone is about 1.5 millions which is about 95% of the total MSME sector. The MSME generates 9.309

million employment of which microenterprises alone generate 6.534 million employment which is about 70% of the total MSME sector and the gross output of the MSME sector are 7075.1 billion of which microenterprises alone generate 3129.73 billion which is about 44% of the total MSME sector. MSME promotes the formation of micro and small enterprises in the country with the objective of creating self-employment and upgrading the skills of existing and potential entrepreneurs. To keep the pace of the microenterprise self-employment generation capability, particularly, the first generation entrepreneurs, a proper training method should be developed which not only encouraged the young entrepreneurs but also equipped them to go into new ventures. The Ministry of MSME, Government of India has set up three National Level Entrepreneurship Development Institutes like: - The National Institute for Entrepreneurship and Small Business Development (NIESBUD), Noida, National Institute for Micro, Small and Medium Enterprises (NI-MSME), Hyderabad and Indian Institute of Entrepreneurship (IIE), Guwahati to undertake the task of entrepreneurship and skill development training on a regular basis.

Keeping in mind this constraint, the objective of the paper is to develop various training methods needed for developing micro-entrepreneurial skills and also to develop a conceptual framework for identifying the various training methods needed to develop the micro-entrepreneurial skills. Various training methods with its advantages and disadvantages have been given which could be used to upgrade the micro-entrepreneurial skills. It also provides suitable guidelines as to how effective training methods could be designed to facilitate the acquisition of these entrepreneurial skills which will not only create employment generation but also make sustainable livelihood.

In reaching the above mentioned objectives, the paper is structured in the following manner. Section 2 reviews the relevant literature available on the subject. Section 3 discusses the conceptual framework for identifying the training methods needed to develop the micro-entrepreneurial skills followed by the conclusion in Section 4.

2. A REVIEW OF RELATED LITERATURE

2.1 Concept of microenterprise- According to Schreiner & Woller (2003), “Microenterprises are tiny businesses; most having one employee, the owner”. Awasthi (2004) said that the enterprises employing less than six workers come under the category of microenterprise.

2.2 Need to promote microenterprise- Otero & Rhyne (1994) stated that, for the increasing number of poor people, microenterprise is a source of income and employment where no other alternatives are available. Importance of micro and small enterprises in contributing to job creation and comprehensive growth is widely accepted (Eversole, 2003).

2.3 Training need- Buckley and Caple (1996) explain that a training need arises when there is a shortfall in performance or when performance could be improved, in order to increase the productivity or a high quality of service. As per the final report of fourth all India census of

MSME 2006-07 of registered sector, the one of the major reasons reported by sick enterprises are marketing problems (11.48%) and management problems (6.46%).

2.4 Definitions of training- According to Edwin B. Flippo (1984), "Training is the act of increasing the knowledge and skills of an employee for doing a particular job". According to Michael Armstrong (2006), "Training is the systematic development of the knowledge, attitudes and skills required by an individual to perform adequately a given task or job." According to De Cenzo & Robbins (1996), training is essentially a learning experience, which looks for a relatively permanent change in an individual's knowledge, skills, attitudes or social behavior. Training methods are thus proposed at changing the current level of skills and knowledge regarding a job.

2.5 Entrepreneurial education and training- Garavan & O'Cinneide (1994a) stated some of the commonly cited objectives of entrepreneurship education and training- to acquire appropriate knowledge to entrepreneurship; to acquire skills needed in the use of methods or techniques, analysis of solutions and integration of action plans; to identify and foster entrepreneurial drive, skills and talent; to develop affinity and support for all unique aspects of entrepreneurship; to construct attitudes towards change and to boost new start-ups and other entrepreneurial ventures. Garavan & O'Cinneide (1994a) further said that the pattern behind most entrepreneurship education and training programs is of a technical nature, by giving a quick fix program in those areas and disciplines which the participants are not familiar with. Manning (1996) emphasized that of all the tasks, training and development of people is the most crucial as there is no other way to productivity, profitability or survival in the new business field. Teke (1997) also emphasize the role of training in empowering the workforce to be creative and innovative in essential business activities. The key to training of small business enterprises to be effective is that it must be kept simple. Small segments of on-going, hands-on type training that allows trainees to participate and discuss business matters of mutual concern, would seem to provide the best results further the trainers must have business experience, be supportive towards the trainees and preferably speak their native language (De Waal 1997). Fayolle (1998) claim that entrepreneurship training programs, mostly focus on two areas: - the first one is training for business startups that focuses mainly on the domain of knowledge, experience and aptitudes of entrepreneurs and the second one is training those people who will start-up businesses by creating entrepreneurs. Ladzani & Van Vuuren (1999) found that training interventions in South Africa are proposed at personal motivation and entrepreneurial skills. Nieman (2001) indicated that entrepreneurship and small enterprise training can be drawn from various angles.

The main areas of concern are business skills training, entrepreneurial skills training and technical skills training. The business skills' training covers all general management training areas in a business. Technical skills training tries to address the ability to use knowledge or techniques of a particular discipline to reach certain limits. Entrepreneurial skill training involves the setting up and growth of business enterprises and also includes other entrepreneurial characteristics like creativity and innovation, risk propensity, leadership, need for achievement etc. Research conducted by Ibrahim & Soufani (2002) & Owusu-Ansah & Fleming (2001) revealed that entrepreneurs who attended entrepreneurship courses have a high tendency to start their own

businesses compared with those have attended other business courses or not have attended any courses.

These researchers also confirmed research that indicated that entrepreneurship training is critical to enterprise success. According to Ladzani & Van Vuuren (2002) training plays a crucial role in supporting small businesses. They also recommended that entrepreneurship training should be recognized as one of the basic requirements of starting and managing a business. Orford, Wood, Fisher, Herrington & Segal (2004) all agreed that education, experience and training all together are the key elements in successful enterprise creation. Solomon (2004), in his study on entrepreneurial training discovered the need for entrepreneurial skills and business skills for the maintenance of the business. Training for small business is mainly internally focused and convey general management skills such as finance, marketing, record-keeping, human relations, as well as industrial relations (Solomon, 2004).

2.6 Definitions of skill- Wickham (2001) described skills as the knowledge that is determined by action – an ability to perform in a positive way. The skills that are required by entrepreneurs can be grouped into three distinct categories: - technical skills, business management skills and personal entrepreneurial skills. Technical skills include oral and written communication, technical management, and organizing skills. Business management skills are the managerial skills like accounting, decision making, planning and marketing. Entrepreneurs must have personal skills like innovation, risk taking and steadfastness (Henry *et.al*, 2005). According to Botha (2006), the absence of key skills like motivation, ability to gather resources, financial management, marketing management, human resource management, and technical skills, may lead to nil performance, while flaw in a particular element would decrease effectiveness in the overall performance of the venture. Business and entrepreneurial skills are important for the sustainability and profitability of businesses (Smith & Perks, 2006). Kunene (2008) argues that the entrepreneur's initiative and skill are significant determinants of success. Nandram (2002) concludes that in order to be successful the entrepreneur must have a combination of attributes and skills which includes being goal-oriented, decisive, efficient, courageous, flexible and self-confident. A literature search on skills, abilities or competencies revealed that skills can be grouped into four categories, namely personal, technical, business operations and management skills.

Most literature on entrepreneurship (Evenden & Anderson, 1992; Pearson & Thomas, 1991; Van Aardt & Van Aardt, 1997 & Vosloo, 1994) recognizes the skills necessary for starting a new business. A list compiled by Van Aardt & Van Aardt (1997) & Vosloo (1994) comprises the following personal skills: - good organizers; good problem-solving abilities; good communication skills; the ability to effectively handle stress; good leadership qualities; very high degree of decision making and negotiation skills.

Technical skills are the ability to use the procedures, tools and techniques of a specialized field (Robbins & De Cenzo, 1998). According to Hodgetts & Kuratko (1989), technical knowledge enables the person to understand how specific things work. Hodgetts & Kuratko (1992) further proposed that the entrepreneurial characteristics that contribute to small business success are doing with technical and mental ability, creativity, human relations skills and high achievement drive. The five categories classified by Hirschowitz, Slabbert, Clark & Van der Walt (1989) consist of

the following broad and interrelated categories:- product knowledge which describes what the particular product could do and what it could be used for; process knowledge describes how to manufacture the relevant product and all the steps that must be taken to do so; knowledge of the service is required to perform the tasks necessary to render the service; knowledge of the market and the type of firm or person who would actually need or who could find a use for the product or service and knowledge of methods of communication which would inform the customers of the product or service.

The following are the groups of basic business operations skills identified by Van Dyk *et al*. (2001): - general business management like short-term planning, budgeting, handling security and safety; record-keeping like stock and inventory control and bookkeeping; financial management like handling of credit, debt and repayments; interpersonal relations like handling employees and customer relations like selling and dealing with customers.

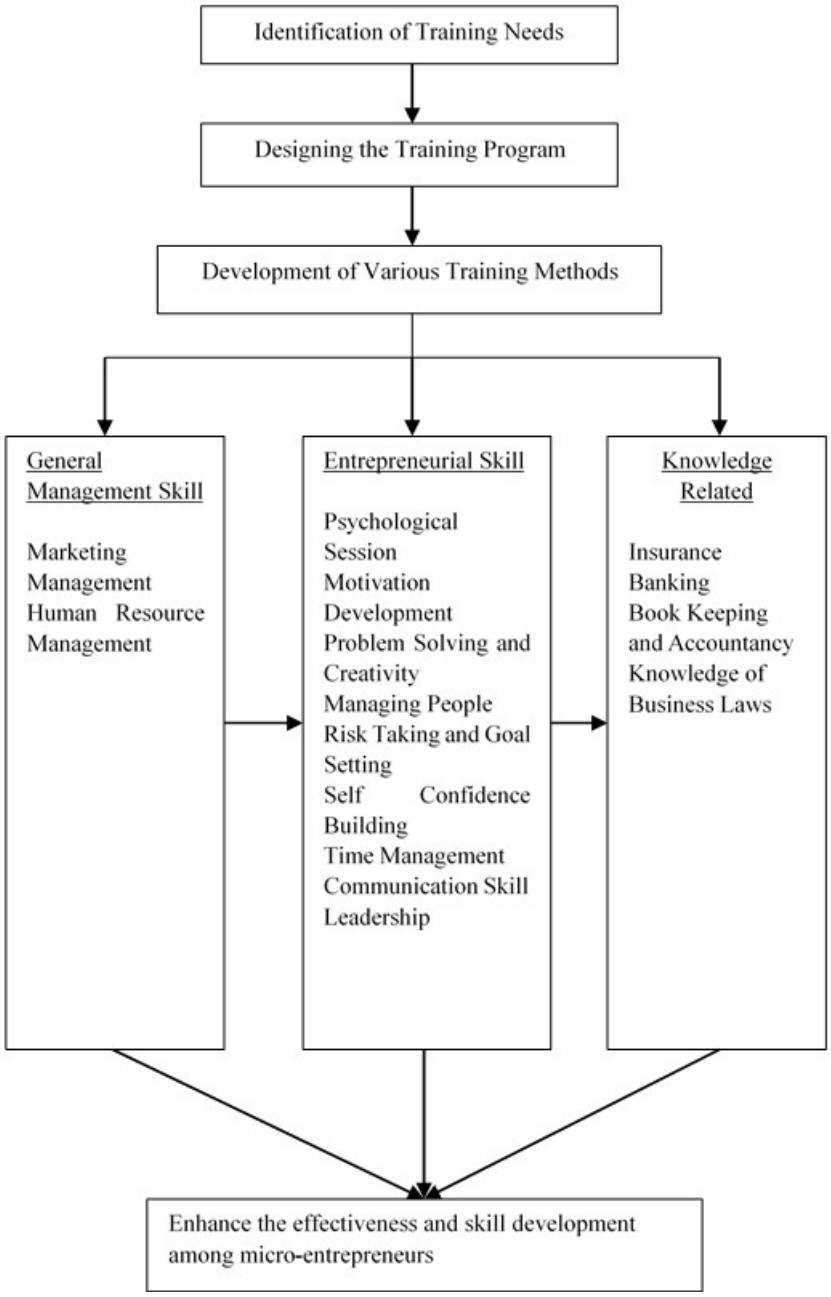
Whettenand & Cameron (1991) & Robbins & De Cenzo (1998) identified different skills of an efficient and effective manager. Epstein & Rogers (2002) outline the competencies of a skilled manager which are as follows: - communicates effectively; manages rewards; recognizing achievement; presenting a clear view; manages teams effectively; manages the environment; matches people's skills with tasks; provides the training; allocates resources fair and generous, and demonstrates high motivation and devotion in their work. A literature survey by Van der Wal (2001) on the demanding skills that managers need to perform their management tasks, confirms the need for particular skills to execute the four management activities that is planning, organizing, leading and control.

3. DISCUSSION OF THE FRAMEWORK

The figure 1 below shows a conceptual framework of various training methods for enhancing the effectiveness and skill development among micro-entrepreneurs in India. The conceptual framework developed is a step by step process and it has been shown by the downward arrows. Firstly, it identifies the training needs. Secondly, it designs the training program. The designing of the training program has been divided into five important criteria. They are: - the content of the program, language, selection of trainees, follow-up and the qualified instructors. Thirdly, it develops various training methods needed for enhancing the effectiveness and skill development among micro-entrepreneurs in India. The development of various training methods for micro-entrepreneurs in India generally fall into three different important categories. They are: - General Management Skill, Entrepreneurial Skill and Knowledge Related. The general management skill has been further sub-divided into: - marketing management and human resource management. The entrepreneurial skill has been further sub-divided into: - psychological session, motivational development, problem solving and creativity, managing people, risk setting and goal setting, self confidence building, time management, communication skill and leadership. The knowledge related has been further sub-divided into: - insurance, banking, book keeping and accountancy and knowledge of business laws. The conceptual framework has been developed by taking various training methods as no research work had been done earlier in India by taking these various training methods. As indicated by the sideways arrows between general management skills, entrepreneurial skills as well to the knowledge related matters from entrepreneurial skill, it

shows it has direct and interrelated effects between them. It means that two types of skills and the information related matters are altogether needed by the micro-entrepreneurs for enhancing the effectiveness and skill development among micro-entrepreneurs in India. The downward arrows from the general management skill, entrepreneurial skill as well as from the knowledge related matters shows they have direct effects relating to the enhancement the effectiveness and skill development among micro-entrepreneurs in India.

Figure 1 A Conceptual Framework



3.1 Identification of Training Needs- MSME promotes the formation of micro and small enterprises in the country with the objective of creating self-employment and upgrading the skills of existing and potential entrepreneurs. As per the final report of fourth all India census of MSME 2006-07 of registered sector the number of working enterprises in ten States are Tamil Nadu (14.95%), Gujarat (14.70%), Uttar Pradesh (12.00%), Kerala (9.60%), Karnataka (8.71%), Madhya Pradesh (6.84%), Maharashtra (5.54%), Rajasthan (3.51%), Bihar (3.20%) and Punjab (3.08%) had a share of 82.13%.The top ten States of India in terms of sick enterprises were Kerala (21.02%), Tamil Nadu (11.41%), Uttar Pradesh (8.67%), Maharashtra (8.34%), Karnataka (6.18%), Rajasthan (5.25%), West Bengal (4.89%), Punjab (3.93%), Andhra Pradesh (3.92%) and Madhya Pradesh (3.05%), which account for 76.66% of the total sick enterprises. As per the final report of fourth all India census of MSME 2006-07 of registered sector, the one of the major reasons reported by sick enterprises are marketing problems (11.48%) and management problems (6.46%). To keep the pace of the microenterprise self-employment generation capability and to promote the entrepreneurship, particularly among the first generation entrepreneurs, a proper skill related training program should be developed which not only encouraged the young entrepreneurs but also equipped them to go into new venture creation.

3.2 Designing the Training Program- The five important criteria required for the success of a training program are: - the content of the program, language, selection of trainees, follow-up and the qualified instructors.

3.2.1 The content of the program- The topics generally covered by entrepreneurial training programs includes- general management skills training, entrepreneurial skill development training and information related. The general management skills training program contains the basic knowledge of banking, the most important part of any aspiring entrepreneurs. The knowledge of marketing management and human resource management is the important part of the training program as it delivers the trainees the importance of customer service and also to give the idea to work out the marketing strategy for their products and services and the human resource management explains the importance of the work force in any enterprise. The entrepreneurial skill development training programs contain psychological and motivation development session, which helps the trainees to boost their needs and shows the importance of motivation in the success of a person. It also motivates the trainee to undergo self employment. The aspiring entrepreneurs also learn the problem solving and creativity development techniques, risk taking techniques, communication development skills and leadership quality and the last content of the training program is the information related. It gives the trainees the importance of knowledge of bookkeeping and accountancy and also gives the knowledge of the business laws as it is a must for every aspiring entrepreneur.

3.2.2 Language- It is also one of the crucial parts of the training program as it is the language which is used for the communication between the trainer and the aspirant. The language for communication should be in the local language spoken there.

3.2.3 Selection of trainees- Any unemployed youth in the age group of 18-45 years, regardless of caste, creed, religion, gender and economic status, having the aptitude to take up self

employment or wage employment and having some basic knowledge in the related field can undergo training.

3.2.4 Follow-up- With regard to follow-up, ongoing counselling and advisory services should be readily available to the aspiring entrepreneurs.

3.2.5 Qualified instructors- It is the backbone of any training program as it is the trainer or instructors who gives the training to the trainee. The qualified instructor is required for the business laws and also for the book-keeping and accountancy.

3.3 Development of Various Training Methods- The various training methods for micro-entrepreneurs generally fall into three categories. They are: - General Management Skill, Entrepreneurial Skill and Knowledge Related.

3.3.1 General Management Skill Development- These skills can be clearly identified from the others skills as these are general management skills and their relative importance depends upon the stage of development of the business. It is the base skills of the entrepreneur. One of the keys to effective training seems to be the ability to teach sufficient of a skill to address current problems at the time the entrepreneur needs it. The more the trainees can identify with, and see the relevance of the training materials, the more effective they will be. The general management skill development has been further divided into two subheadings. They are:-

3.3.1.1 Marketing Management- Marketing is the process of communicating the value of a product or service to customers so as to sell that product or service. It can be looked at as an enterprise function and a stipulated process for creating, delivering and communicating value to customers, and managing customer relationships in many ways that also benefit the enterprise. The customer is an important person for an entrepreneur. Skillful Management of the customers is the backbone of any successful venture. Hence it is necessary for an entrepreneur to understand the importance of managing the customers properly.

Advantages

1. An advantage of marketing is the promotion of the business; getting the recognition and attention of the target customer across a specific market. 2. The most important advantage of marketing is improving the business profits by improving sales.

Disadvantages

1. The most important disadvantage of marketing is the cost. Adverting and marketing cost money. Inappropriate marketing efforts by targeting the wrong customers using an improper medium would be a serious and costly mistake. 2. A potential disadvantage of marketing is the risk of time wasted for an unsuccessful campaign.

3.3.1.2 Human Resource Management- The success of any business largely depends on its human resources so it is one of the necessities in every enterprise. Hence, a proper attention has to be given to human resource planning, recruitment, selection and training by the entrepreneur.

Advantages

1.Recruitment and training is one of the major responsibilities of the human resource management. The HR managers come up with plans and strategies for hiring the right kind of employee. When needed, they also arrange training to the employees according to the necessity of the enterprise. Thus, the employee gets the opportunity to sharpen their existing skills or develop new specialized skills which will help them to take up

new roles in the future. 2. Maintaining a work atmosphere is a vital aspect of HRM because the performance of an employee in an enterprise is largely driven by the work atmosphere or work culture that persists in the workplace. A good working condition is one of the benefits that the employees can expect from the human resource team. A safe, clean and healthy environment can bring out the best in an employee. A cordial atmosphere gives the employee job satisfaction as well. 3. In an enterprise, there are several issues on which disputes may arise between the employees and the employers. In such a scenario, it is the human resource department which acts as a consultant and mediator to sort out those issues in an effective manner.

Disadvantages

1.A disadvantage of adding human resources is that it requires abdicating control regarding how the business operates. Other people make an important decision, which includes hiring and personnel relations. If the outsiders were brought into the organization or even outsource the human resources functions, the risk still persists that these individuals will not fully adapt to the degree of the business and end up making decisions that are not in the enterprise's best interests. 2. It takes time to successfully implement a human resources department. It will take time to hire the staff or outsource the function. Depending on how large the HR department would be, it could represent a significant cost to the business as well.

3.3.2 Entrepreneurial Skill Development- This is the most vital factor in entrepreneurship courses designed to help MSME's grow. It requires an emphasis on motivational and psychological training that develops the self-confidence and initiative taking ability of the entrepreneur. Loucks (1988) in his study of successful entrepreneurship courses concluded that "the longest running entrepreneurial development programs with a substantial record of success include achievement motivation training as a significant feature". However, it is worth remembering that the drive, energy, commitment and enthusiasm of an individual teacher can often achieve better results than a more soundly based methodology, implemented in a lackluster way. Harper (1984) in his study of successful entrepreneurship courses observed that many courses did not use these devices, instead relying upon "inspirational lectures and in particular presentations by experienced entrepreneurs" to achieve successful results. The entrepreneurial skill development has been further divided into nine subheadings. They are:-

3.3.2.1 Psychological Session- This session is essential as the youth comes to the training program, particularly from the rural areas is usually shy and introvert in nature. They may not mix freely with new face people or with people they have not met earlier and this may likely to hinder the learning process. As in the training program, participants used to come from various neighboring villages or cities and they may not know of each others, so this session is essential as until and unless they are psychologically prepared, their fear to mix with new face people are shed and their resistance is lowered, the participants may not get the benefit of the training program.

Advantages

1.The participants become familiar with each others, their fear to mix with new face people are shed which is ultimately beneficial for the training program. 2. The heterogeneous group becomes homogenous group.

Disadvantages

1.Reluctant to change, but as change takes place it is a permanent change. 2. Time taking process as to induce a permanent change in behavior it requires time.

3.3.2.2 Motivation Development- This session aims at helping the participants to boost their needs. The word 'motivation' has been derived from 'motive' which means any idea, need or emotion that prompts a person into action. Motivation would likely to boost the behavior of a

person like striving for excellence, moderate risk taking ability, learning from feedback, problem solving and creativity etc.

Advantages

1.It shows the importance of motivation in the success of a person. 2. It explains how motives or needs and self confidence influence the achievement of goals. 3. The organization works smoothly and conveniently as there is co-operation with management

Disadvantages

1.One disadvantage of motivation is time which is required in changing the behavior of the trainee. 2. Another disadvantage of motivation is the threats of strikes, demonstrations, etc. creates problems for the management.

3.3.2.3 Problem Solving and Creativity- One of the distinguishing and important characteristics of an entrepreneur is the capability to solve the problems. An entrepreneur will face a variety of problems in the course of time of establishing and managing the enterprise. So this session is necessary for the smooth, solving of the problem when one encounter with it.

Advantages

1.Creative thinking allows an entrepreneur to come up with numerous ideas rather quickly. Being able to think quickly can help them to solve a variety of problems that will come in the course of establishing and managing the enterprise. 2. Creative thinking can make a person a perfect problem solver. Being able to think creatively allows an entrepreneur to come up with solutions to problems than others. Creative thinking is something that can be a huge benefit to almost any profession because quick thinking is a great skill.

Disadvantages

1.A creative entrepreneur because of lack of time will accept some of his immediate ideas instead of taking time to really think about what it is trying to accomplish. 2. When a creative entrepreneur comes up with several ideas he may start trying to put all those ideas together instead of maintaining the focus on one.

3.3.2.4 Managing People- Managing people for an entrepreneur is the utmost important job because preparing good human relations between the people or workers will help the entrepreneur to achieve an outstanding and sustaining success not only in personal life but also in professional life.

Advantage

1.It highlights the importance of human relations with customers, other related entrepreneurs, competitors, workers, suppliers, family members, relatives, friends and well wishers.

Disadvantage

1.People are not always friendly and they make mistakes and errors that could cause major issues.

3.3.2.5 Risk Taking and Goal Setting- Risk taking is an important aspect of an entrepreneur. The entrepreneurs need to take risks and set the goals to be achieved. A good entrepreneur always set the goals that cannot be easily achieved and also set the goals higher and loves to take risks, but in reality, most of the entrepreneurs end up taking a low risk and set goals that can be easily achieved they just show hindrance in taking risk. The entrepreneurs should develop their capacity to take risks and set goals to be achieved as both these qualities are essential to start and successfully run an enterprise.

Advantages

1.Goals can provide a future direction of the business, which helps the entrepreneur to guide the employees in everyday decision making processes. 2. Setting a goal is designed to motivate an employee and help them increase their performance.

Disadvantage

1.Goals that are not properly constructed can become a demotivating factor. If the goal seems too easy or not explicit enough, then the employee is not motivated to achieve it.

3.3.2.6 Self Confidence Building- It is often seen that today's youth whenever sees risk and uncertainty; they tend to withdraw because of lack of knowledge and skills to handle such a risk and unfavorable situation. So this directly affects their self confidence and the lack of self confidence ultimately leads to poor performance. As self confidence is one of the most important human attribute required in youth to become successful entrepreneurs.

Advantages

1.Lack of confidence can restrict an entrepreneur from achieving the peak performance needed to become a successful entrepreneur, while self confidence can help them to overcome obstacles and pursue and use those skills needed by them to succeed. 2. People who are self confident are more relaxed in social interaction when meeting new people.

Disadvantages

1.They might become arrogant and do not accept the ideas of others as they only trust in themselves and that makes them that people who have different ideas are always inferior than them. 2. Those with high self confidence due to arrogance might not correlate with others well and might develop related problems because whatever they do come from, what they want and often they often not thought about others feelings and it could affect their relationships.

3.3.2.7 Time Management- For an entrepreneur, time is one of the most precious assets because if once lost cannot be got back. Successful entrepreneurs make use of time and get the best out of it by managing it better. Thus time management is about setting clear priorities and making sure that they are achieved. Effective time management involves planning the amount of time spend on all of the tasks needed for running, growth and success of an enterprise and to get the things done in the most effective and productive manner. An entrepreneur should know the importance of time management and avoid the wasting of time, which ultimately reduces the stress on them.

Advantages

1.Proper time management is helpful for an entrepreneur in reducing stress because of a proper prioritized schedule which will always help them to complete all important tasks in time. 2. It gives an entrepreneur a sense of achievement because the tasks are completed on time without crossing the deadlines. 3. Time management can enhance the energy of an entrepreneur because after completing the tasks on time, they get more relaxed. 4. Time management also increases the productivity and personal satisfaction.

Disadvantages

1.Time management results in tension to complete the task as soon as possible. 2. It may make the daily routine and activities inflexible. 3. It can also make the life tougher and hard because the person has to do the tasks in accordance to their priority in time management.

3.3.2.8 Communications Skills- Communication is an indispensable activity in all organizations. No organization can think of its existence without effective communication. Communication is an entrepreneurial skill which is essential for effective direction of people at work. That is why, Chester Barnard remarked (1968), "The first executive function is to develop and maintain a system of communication". To run the enterprise smoothly or to interact with his workers, customers and suppliers an effective communication is an essential tool. Today, effective communication is a must for efficient marketing and building a good image with the customers. Thus, it is necessary for an entrepreneur to understand the importance of communication and acquire effective communication skills.

Advantage

1.Communication between employees is a process that helps the people to manage, create and sustain organizational operations.

Disadvantage

1.One disadvantage of communication is conflict. Employees use communication to disagree and argue with each other and with management. Conflict causes tension among employees and this ultimately leads to failure of task completion.

3.3.2.9 Leadership- Leadership is a process of influence in a group. Leadership can be an important modifier of the behavior of people working in the enterprise. Effective leadership is necessary for inspiring the people to work for the accomplishment of giving objectives. In the words of Louis A. Allen (1958), "A leader is one who guides and directs other people. He gives the efforts of his followers a direction and purpose of influencing their behavior". The leadership quality of an entrepreneur is essential as it will enable him to inspire and motivate others to work for the success of the enterprise.

Advantages

1.Leadership can be advantageous to businesses if leaders are able to delegate tasks efficiently and increase worker productivity. Efficient division of labor can result in higher work output, which ultimately results in higher sales and higher profit. 2. Sound leadership can improve employee morale and make workers more loyal to the company.

Disadvantage

1.One reason that leadership can be a disadvantage in business is that leadership alone is not a beneficial activity. An entrepreneur who employs few employees might find that the time he spends while performing leadership tasks, cuts into the time he has to spend communicating with clients and making sales. Some entrepreneurs hire managers to lead employees on their behalf, but hiring managers can be expensive too.

3.3.3 Knowledge Related- MSME's need a whole range of knowledge of law, taxation, book-keeping, sources of finance as well as market research information. They are constantly looking for what constitutes good management practice in their industry. Often knowledge is a pre-requisite for finding resources. The knowledge related matters has been further divided into four subheadings. They are:-

3.3.3.1 Insurance- This session will highlight the importance and need of insurance for an enterprise. The knowledge of various insurance policies will enable the trainee in ensuring

insurance for their building, equipments, machinery, tools, etc. so that sudden losses could be avoided.

Advantages

1.If some disaster strikes, insurance can be the difference between staying in business and going bankrupt. 2. It can recover lost money, restore damaged and provide a shield against a lawsuit.

Disadvantage

1.Although business insurance may offer protection against disaster and help the person to sound sleep but it rarely comes cheap.

3.3.3.2 Banking- It is one of the essential requirements of an entrepreneur as to start a new venture. An entrepreneur needs capital and this capital is provided by the banks. Banks plays a vital role in enterprise development. Lack of detailed information on the bank's financial assistance to various self-employment activities is an obstacle of getting timely finance from the banks. Thus, it is essential to understand the principles, practice and procedures of bank finance.

Advantages

1.It defines and describes the basic functions of a commercial bank. 2. An account with a bank will make it easier for the entrepreneur to borrow the money when they need to grow their business.

Disadvantage

1.Different banks offer different variety of services and charge different fees, which seem very difficult to compare the services.

3.3.3.3 Book Keeping and Accountancy- It is one of the necessities of every entrepreneur. Absence of such a system is one of the important reasons for failures and wrong decisions making. Accounts are the eyes' of business and it shows the economic condition of the business very clearly. The entrepreneur needs to keep proper and regular accounts which subsequently help the enterprise to grow.

Advantages

1.It helps entrepreneurs understand the net worth of their enterprise and stay in control of the finances. Information accessible includes how much money the business owes and to whom and how much money the business is owed and from whom. 2. A bookkeeping system facilitates up-to-date enterprise financial information that can be cross-checked with the budget to make sure that the enterprise is not overspending. Bookkeeping also identifies proof of under-spending so the company may find new uses for the extra money to help productivity.

Disadvantages

1.One disadvantage related to bookkeeping is time. Gathering financial records, researching ledger disparity and mark down errors can take hours, even with software. It takes time to maintain the books by adding new information, and it also takes time to effectively analyze bookkeeping records in order to make financial decisions. 2. Cost is another disadvantage related to bookkeeping. Bringing an external bookkeeper can be costly for smaller enterprise. Buying bookkeeping software for the enterprise can also be a costly affair. 3. Another disadvantage to bookkeeping is inaccuracies. Accidental inaccuracies can result in lost time and money because they must be identified and corrected. Premeditated inaccuracies from untrustworthy employees can result in business fraud or tax evasion by the government.

3.3.3.4 Knowledge of Business Laws- An entrepreneur has to follow certain procedures and rules while setting up an enterprise. These rules are explained in the business laws which have the force of legislation aiming at justice, peace and harmony. Hence, an entrepreneur should be aware of these rules and regulations.

Advantages

1.It explains to the entrepreneur the significance of business laws and its need to follow them. 2. Knowledge of business law is helpful in maintaining a business in legal ways. 3. It helps to make the entrepreneurs aware of the legal issues involving businesses and how to deal with them.

Disadvantage

1.A qualified lawyer is required. Some entrepreneurs hire lawyers to maintain business in a legal way, but hiring lawyers can be expensive too.

DISCUSSION

As we all know, that unemployment is the major challenge to India, which has been facing in the process of its development. Millions of youth are entering the job market every year after finishing their school or college education. The entry of computerization and mechanization in every sphere of commerce and administration due to the advent of science and technology has further highlighted the problem. On the rural side, the employment potential in the agricultural economic system also appears to have arrived at a saturation level leading to large-scale migration of manpower from rural regions to urban regions, adding burden and pressure to already overstrained civic infrastructure. All these clearly show the need for promoting self-employment entrepreneurial ventures among the unemployed youth. Keeping in mind this constraint, the conceptual framework has been developed which could be used to identify, orient, motivate, train and assist the rural youth to take up self employment ventures as an alternative career and also to train unemployed youth to take up wage employment as a source of livelihood. In the conceptual framework, the general management skills give entrepreneurs a framework to undertake the business problems they confront. An inquiry about a problem normally requires information about the firm and the business environment. But still, the entrepreneur needs the motivation to carry through the course of action. Without each of these three essential building blocks mentioned above, the problem will not be resolved. Therefore, MSME training programs should address each of these needs otherwise they will fail to be effective, and fail to help MSME's achieve the growth that is hoped for. The teaching techniques that are appropriate for the different needs have been discussed. Each technique had its advantages and disadvantages. Of course, the appropriate combination of these different teaching techniques within an entrepreneurship course depends not just upon the entrepreneur needs, and hence their training requirements, but also upon the essential to obtain a varied and balanced mixture of techniques in a class.

The Government officers specialized in the areas such as behavioral inputs, managerial inputs, banking, etc. Besides this, the expert practitioners, i.e., guest faculties in the respective field, who intentionally comes forward to provide their services out of social concern, impart skill training are approached to give the training. To impart training program a suitable hall in a school, college, Government building and/or private building with a blackboard and required furniture

sufficient to accommodate the gathering shall be fixed as the venue. The preparation program should extend for a period of seven days to incorporate all the diverse types of training methods.

This study has limitations too, as it has taken only few training methods that are needed to develop the skills of micro-entrepreneurs. There may be various other training methods which are available to be used to develop the skills of micro-entrepreneurs.

This study lays the scope for further research to explore various new training methods needed to develop the skills of micro-entrepreneurs. Further study is needed to incorporate new training methods required to acquire the skills of micro-entrepreneurs. This will help to not only create employment generation, but also create a sustainable livelihood in India.

4. CONCLUSION

The paper had tried to develop a conceptual framework for identifying the various training methods needed to develop the micro-entrepreneurial skills. A proposed training method has also been developed which could be used to upgrade the micro-entrepreneurial skills. It also provides suitable guidelines as to how effective training methods could be planned to ease the learning of these entrepreneurial skills which will not only create employment generation but also create sustainable livelihood. For example- looking at the conceptual framework of entrepreneurial skill under the various training methods it is found that the entrepreneurial skill related training method starts with the psychological session, i.e. first of all it prepare the trainees psychologically as because until and unless they are psychologically prepared, their fear to mix with new face people are shed and their resistance is lowered, the participants may not get the benefit of the training program, then comes the motivation part. Further sessions give the trainees how to be creative and develop problem solving skills then the trainees develop how to manage people then the trainees develop risk taking and goal setting skills further the trainees develop how to be self confident then the trainees develop how to manage time as if time once gone it will never comes back so it is the important part then the trainees develop communication skills i.e. how to communicate with people and the last session is leadership which means that the trainee has gained enough training exposure and now he is ready to be a leader to lead people or workers in their own enterprise. Besides the trainees learn marketing and human resource skills under the general management skills and also learns the need of insurance, banking, bookkeeping and accountancy and lastly the business laws needed for the smooth running of the enterprise under the knowledge related section. So the training program has been designed like in case a small child, the child first crawls then he learns how to stand up, then he starts walking and finally he starts running so it is like a sequence of steps following one by one. The conceptual framework proposed will overcome the problem of identifying the training methods curriculum needed for enhancing the effectiveness and skill development among micro-entrepreneurs to some extent. There is hardly any study in India, which covers the necessary training methods needed to upgrade micro-entrepreneurial skills.

The study has laid the groundwork to explore the various training methods needed to develop the skills of micro-entrepreneurs. Further study is needed to incorporate new training methods to acquire the skills of micro-entrepreneurs. This will serve to create employment generation and too create a sustainable living. This study contributes to the literature by identifying

the various methods, which will upgrade the micro-entrepreneurial skills. Thus the present study is important and has notable implications for the entrepreneurs and policy makers of the country.

This study has limitations too, as it has got only few training methods that are required to acquire the skills of micro-entrepreneurs. At that place may be several other training methods which are available to be used to build up the skills of micro-entrepreneurs.

This work had laid the scope for further inquiry to explore various other new training methods required to acquire the skills of micro-entrepreneurs. Further study is needed to incorporate new training methods required to acquire the skills of micro-entrepreneurs. This will help to not only create employment generation, but also create a sustainable living.

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TECHNOLOGY AND DISTANCE EDUCATION ENTREPRENEURSHIP PROGRAMS: AN EIGHT-POINT FRAMEWORK FOR BEST PRACTICE

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ABSTRACT

Distance education entrepreneurship programs have unique requirements for numerous technology resources to fulfill several overlapping purposes. These purposes especially include the establishment and maintenance of a public persona on the part of the program, its faculty, students' entrepreneurial pursuits, and other constituencies. Consideration is given to an "ideal" platform for technology that would support a robust and effective distance education entrepreneurship curriculum, leading to the suggestion of an eight-point framework for evaluation. After presenting and justifying this framework, it is used to analyze extant learning management systems in an effort to assess the current state-of-the-art of such resources. The result indicates considerable shortfall in current offerings. Suggestions are provided throughout for addressing these gaps and enhancing the learning experience, interpersonal networking opportunities, longevity of assets and marketability of programs.

INTRODUCTION

"The chief objective in many online communities is to allow for knowledge sharing and learning" (Keswani & Chaturvedi, 2013, p. 119). The evolution of this present paper and the framework introduced herein began as a memorandum written approximately three years ago meant to facilitate discussions for program needs between entrepreneurship faculty and IT personnel, specifically those who were focused on supporting a learning management system (Barbosa Cabral, Pedro, & Gonçalves, 2012; Hsui-Ping & Shihkuan, 2008; Kim & Lee, 2008; Williams van Rooij, 2012) that had been adopted by the university which employed all of the parties thereto.

One of the authors of the current paper has persisted, and is now joined by a second author. Both have extensive entrepreneurial backgrounds within high technology fields. Faculty who were responsible for delivering an exclusively online master's degree program through an AACSB accredited college of business voiced that existing learning management systems (LMSs)—given that they were by default designed to deliver instruction to a captive audience of users who were logged-in, and unable to access work after courses concluded—were not designed to leverage the creation of ongoing, and to the extent possible, preferably perpetual online learning communities.

For instance, once courses concluded, learning management systems' discussion boards, therefore archived "knowledge" and histories of students' experiences, were gone (Camarero, Rodríguez, & José, 2012). Faculty wanted course experiences to build upon one another, and for the entire program to be available to students as they progressed. They argued that numerous tools such as bulletin and discussion boards on the Internet existed, did offer options for secure log-on (i.e., private) areas, and did maintain continuity of content over time. But, the university

had invested heavily in a software licensing agreement with a well-known and widely adopted LMS provider, and the institution's response on the part of support personnel was a valiant attempt to customize the LMS's functionality. The author of the aforementioned memorandum likened this effort, although appreciated, as ineffectual (relative to the eight-point framework for best practice presented herein).

Technology resources directly impact the delivery (Hawks, 2008) of any distance education program, its curriculum (Colbert, 2005), its pedagogy, in effect "the product," and hence there are also marketing implications (Adams & Eveland, 2007; Akeusola, Daniel, & Iyere, 2011; Keramidas, 2012; Lorenzetti, 2005; Pituch & Lee, 2006; Randall et al., 1996; Savic, 2005). Entrepreneurship education differs from more traditional (theoretical) disciplines, because those who are enrolled have both a practical orientation and a need to immediately apply course teachings to their current or prospective ventures. As such, any program, to be perceived as viable, must be current relative to its technologies as a minimum standard, and would likely only prosper over time if received as one that is reputed to be operating on the "cutting edge" relative to technology, curriculum, pedagogy and its marketing communications.

One of the primary distinguishing attributes of those who are successful in entrepreneurial ventures is that they have an established interpersonal network (Merwe, Pitt, Murgolo-Poore, & Berthon, 2002; O'Donnell, 2004; Zontanos & Anderson, 2004), and entrepreneurship educators are therefore compelled to support the development of strong relationships to include those with faculty, but also with the cohort and alumni, and members of the business community at large (Castaldo, 2007; Merwe et al., 2002; Morris, Schindehutte, & LaForge, 2002; Zontanos & Anderson, 2004). From a technology perspective, necessary tools (Camarero et al., 2012; Finney, 2004; Harris & Park, 2008; Little, 2011; Ralph & Stahr, 2010; Wiid, McCormack, Warren, Buckley, & Cahill, 2013) for enabling students who are working at a distance to come together and work collaboratively include video, audio, textual, and other asynchronous as well as synchronous communications methods. Thus far, courses with some programs have involved the use of the aforementioned tools in order to allow students to collaborate and build the social network they will need to be successful both in their academic pursuits and as practicing entrepreneurs (Scott, 2013; Zontanos & Anderson, 2004).

Another primary attribute of successful entrepreneurs is that they typically distinguish themselves in publicly visible ways (preferably as experts in their chosen field and/or industry). The pedagogy and curriculum entrepreneurship educators therefore should include work products—with students often working in collaboration with one another during the creative and execution phases of the assignments—that leverage numerous technology and communication platforms. Some of these work products and entrepreneurial results, both good and not so good, may also have an impact on the overall brand image of an institution.

REVIEW OF EXISTING LITERATURE

We have conducted a series of searches in the academic literature which revealed that scholarly study of component parts of our topic have been supported by significant bodies of research, respectively. For instance, searching databases such as *Academic Search Premier* revealed "distance delivery" has been researched extensively. Other topics such as "social capital" are also treated extensively in the literature. Adler and Kwon (2002) observed "a growing number of sociologists, political scientists, economists, and organizational theorists have invoked the concept of social capital in the search for answers to a broadening range of

questions being confronted in their own fields" (p. 17). Within the entrepreneurship discipline we would submit that as a logical construct the notion that: "the core intuition guiding social capital research is that the goodwill that others have toward us is a valuable resource" (Adler & Kwon, 2002, p. 18), applies to the framework we have proposed.

Using the database *Academic Search Complete* with limiters set for full text scholarly (i.e., peer reviewed) journals returns from the query displayed 30,785 search results for the terms "online learning communities" and "social media." After setting limits for publication dates we found that almost 18,808 of these results have been published in the last five years (from 2008 to 2013). However, in searching for "online learning communities" and "entrepreneurship" with the same limits set for full text scholarly journals using "Boolean searching or exact phrase searching" we determined that no search results were found. Using the terms "social media" and entrepreneurship" with parameters set the same as the last-mentioned example above, we found only six articles were returned, none of which bore a resemblance to our topic here.

In contrast to the lack of attention from both a research perspective and facilitation by providers of LMSs, practitioners at large seem to be forging ahead with the integration of social media, display of work efforts and assets, and the clear advantages this confers to participants. For example, a cover story article entitled "*LinkedIn*: How it's changing business (and how to make it work for you)" in *Fortune Magazine* observed:

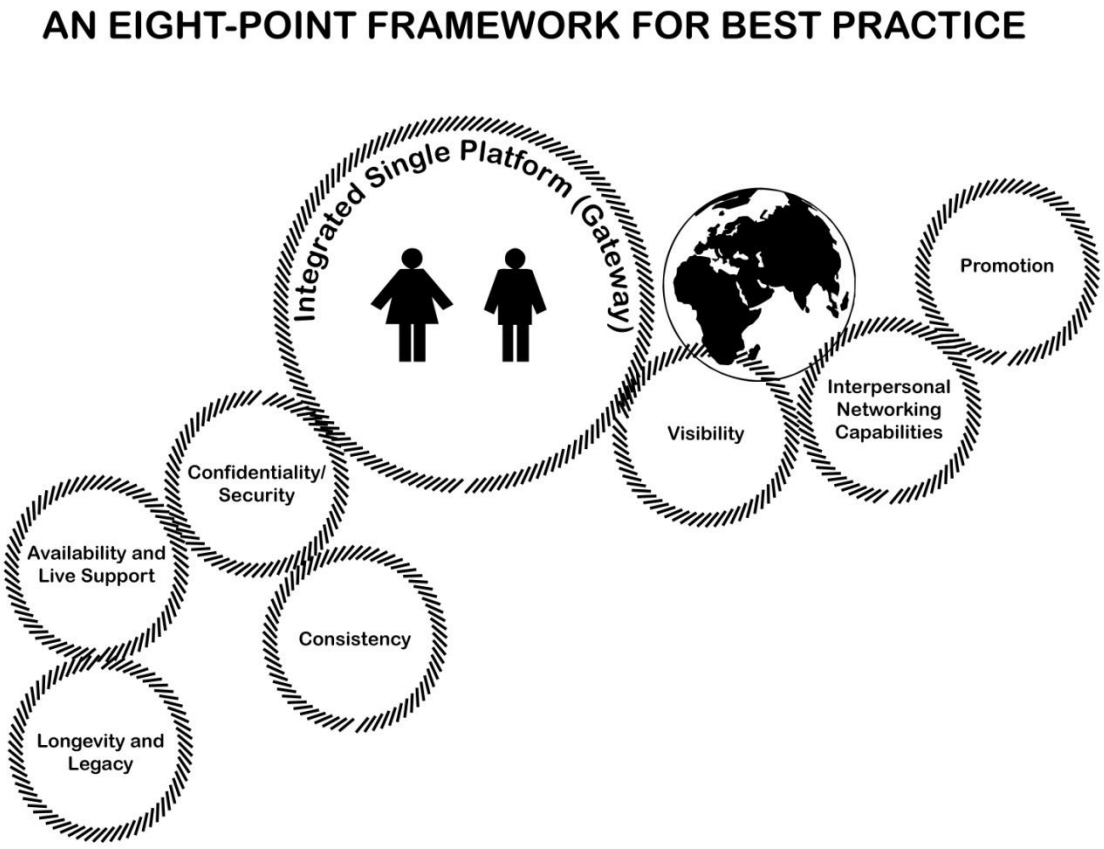
> In the past year LinkedIn has emerged as one of the most powerful business tools on the planet. Long considered a repository for digital résumés, the network now reports 225 million members who have set up profiles and uploaded their education and job histories. These days they're doing far more than prospecting for new gigs. LinkedIn users are building professional portfolios that showcase their best work, from publications to videos to PowerPoint presentations. They are relying on a growing array of LinkedIn apps, like CardMunch, which lets users scan business cards to upload contact information. They're recommending one another for particular business attributes. (Hempel, 2013, p. 70).

Given the paucity of search results overall and especially those lacking in the entrepreneurship discipline with which we as researchers are primarily concerned, we have embarked on redressing the lack of attention in this area, despite the disparate explorations of components of the topic. Hence, we next present an eight-point framework for technology best practice in distance education entrepreneurship programs that is derived from anecdotal experience in working for over 20 collective years in online pedagogy and by synthesizing research undertaken from several disciplines.

ANALYSIS OF LEARNING MANAGEMENT SYSTEMS

The authors of this paper propose eight critical characteristics that can be considered as potential requirements for an overall distance entrepreneurship program platform (hereafter referred to as "the system"; see Figure 1): 1) confidentiality/security, 2) availability and support, 3) visibility, 4) consistency, 5) integrated single platform (gateway) for communication, 6) interpersonal networking capabilities, 7) longevity or legacy, and 8) promotion of the program. These are further elucidated below, followed by a reflection on how an "ideal," all-inclusive platform that might provide these eight critical characteristics has yet to emerge in the market of technologies and tools (i.e., required social networking technology for distance entrepreneurship education) available to entrepreneurship educators.

Figure 1: An Eight-Point Framework for Best Practice



Confidentiality/Security

The system must be secured and only people that are subject to nondisclosure and other agreements can have access to certain information within the system. In this way, a "sandbox" of sorts emerges where students of entrepreneurship, perhaps in early stages of the development of real business ideas, can speak freely amongst a learning community. This is often the only way students will feel free to share and develop their ideas for new ventures. Knowing that their ideas, vetting, and interaction will be held in confidence and safely cordoned off from outsiders, serves the purpose of a veritable safe haven incubator. This confidentiality and security must extend to backups of the system and access by those personnel that support the software systems. There are also unavoidable issues of privacy laws (e.g., FERPA) for the protection of students' personal information and other sensitive data.

Availability and Live Support

The systems (JarmÉUs et al., 2012; Pituch & Lee, 2006; Savic, 2005) must be available for users to access 24 hours each day, seven days per week if expectations for (Keramidas, 2012) participation exist. Support for the system must likewise be available on a similar or identical

schedule. However, some universities do not provide "around-the-clock" information technology support. With budgets constrained as they often are, this can be acknowledged as a real challenge. Many working professional distance students' use "off" or "odd" hours to complete assignments, and when things go wrong, they need access to solutions. For example, programs that may be available to members of the United States Armed Forces typically enroll students located around the globe. Military students engage in coursework by getting online when they are off duty, which, owing to differences in time zones depending on where they are deployed, can often vary considerably from "normal working hours" in the United States. To be sure, this same issue of disparate locations/disparate time zones and its corresponding impact on support convey just as importantly to global recruiting and international students participating in online education from their home countries.

Visibility

To be integrative and foster the creation of social capital, the system must have both a public and a private side. The private side is for the students in the program. The public side must be easily found in search engines for marketing purposes and the development of both student and program reputation. As well, the program's website should be a place that people outside the program can find out about not only the curriculum, but also students and their businesses, (e.g., testimonials and human interest stories), as well as faculty engagement and publishing. With limited or no funding for marketing, as is the case with many academic institutions and programs, it is critical that the program be able to "spread the word" virally. This naturally includes select work output and interactions among students that would occur in an integrated system.

Consistency

Over the past several years, most institutions, in keeping up with the evolution of technology, have adopted a "system" that amounts to a constellation of multiple curriculum platforms as well as intranet and website technologies. Despite the evolution of a plethora of technologies that attempt to serve the needs of academia, and the temptation to adopt such tools, it is important to keep in mind that users need to focus their learning on the curriculum, not learning different platforms. So, while continued changes are natural and they often come with benefits, they must be managed and supported.

From a communications standpoint, alumni need to be able to have a consistent way to easily stay in touch with one another, including the possibility of serving as mentors for current students, and with faculty. Continuity of identity, reputation indices, and access to assets and material that are part of a student's, team's, cohort's, or learning community's repertoire of intellectual capital is also important. The ability to consistently present and maintain, with ease-of-use, this ideally uniform "thread" of personal and pedagogical interactions is an important part of a robust system.

Integrated Single Platform (Gateway)

Building a sustainable online distance education platform that facilitates a learning community requires a common gathering place for users. A single portal should exist as a

gateway for program information, curriculum, networking, guests and speakers, visiting subject matter experts, research and publications, alumni and constituency communications. This does not mean that all of these functions must run on the same software, but rather that the gateway should simply be transparent to the users. Such a "meta-interface" is not uncommon amongst social media and other software platforms at large (e.g., *HootSuite*, *TweetDeck*).

Interpersonal Networking Capabilities

The social networks students develop with classmates, past and future attendees, faculty, and outside resources need a virtual (Ralph & Stahr, 2010; Savic, 2005) meeting place. This meeting place must begin with their entry into the program and then continue to support them as alumni. This functionality should be available for people inside and outside of an institution's domain and must be both secure and confidential for various "internal" user roles, and yet public facing for other "external" user roles. This is no different than many public-facing websites where users who are members of an appropriate group, such as employees or clients, are allowed to log-in and exercise privileges that are afforded to them in accordance with their user role, all the way down to an asset level (i.e., with a specific document or item, being able to see some or all of the material).

Longevity and Legacy

A given program's primary resource is its participants and the legacy of the activities in which they have partaken. Systems must continue to support all of a program's community members while they are in that program, and for years thereafter, if universities are planning to live up to claims to the effect that they support continual learning, learning communities, and the like. For instance, LMS discussion boards in particular (Nagel & Kotzé, 2010) currently expire at the end of each course for which they were deployed, or shortly thereafter. But with that expiration a body of knowledge and relationships with participants that was created therein unfortunately also expires. Thus, to foster true organizational learning systems (Lawrence & Chang, 2010), the platform that is utilized must begin with the students' admission, be available for all of their classes, and continue to be a resource for them as post-graduate alumni. Reiterating a point raised at the beginning of the current paper, at the very least it is beneficial for students in a given program to be able to access their previous work, especially when that work is designed (as it should probably be) in a sequential, cascading "building block" type fashion from a curricular point of view (Graf & Tzu-Chien, 2009).

Promotion

In culmination, having the aforementioned integrated platform for initial contact, class information, delivery and archiving, interpersonal networking, and public-/private-facing resources becomes a powerful marketing tool. Such a system could serve as a veritable beacon that draws visitors and prospects to a program, and where appropriate, brings them in or showcases those who are matriculated already as members of a learning and support community that is apparently or in reality spinning-off entrepreneurial successes. Quite conveniently, this marketing instrument essentially "builds itself" by virtue of simply engaging in and executing a learning community approach to pedagogy.

REQUIRED SOCIAL NETWORKING TECHNOLOGY FOR DISTANCE ENTREPRENEURSHIP EDUCATION

In light of these eight characteristics, we now reflect on the current state-of-the-art with Learning Management Systems (LMS), situating their abilities at large in terms of means to deliver on the aforementioned rubric. Our approach considers the broader notion of LMSs in general, given extant functionality, without leveraging this evaluation against specific brands. Note, however, that the authors are certainly familiar with and thus in the main cast their analysis against an "aggregated" understanding of the more popular ones (e.g., Blackboard, Banner). To that end, we preface the following analysis by clarifying that, to our knowledge, a single platform that achieves at least a modicum of results for *all* of the proposed eight characteristics does not presently seem to exist. This assertion can be made based upon one inherent design feature of all such systems, which is a log-in feature and requirement for the protection of students' private information. Hence, the framework we present indicates both private and public arenas in which learning community activities take place.

Confidentiality/Security

LMSs meet the requirement of providing and maintaining the infrastructure necessary for confidential and secure transmission and storage of course-related data, including profile information, communications through digital media, assessments and evaluations, and file repositories. This might be regarded as the "priority requirement" of any information technology system that houses such data. It should be noted, however, that there is typically a trade-off of sorts between confidentiality/security and convenience. To that end, data that a student or cohort might want to transfer into a public, non-secure domain (perhaps after vetting, editing, sanctioning by the learning community and professors) would ideally be accomplished with as little difficulty as possible. This level of "friction-free" data access control and transferability, while achievable, does not appear to be readily available in current LMSs.

Availability and Live Support

LMSs appear to be moving along the path of progress toward being accessible anytime, anywhere, with corresponding support from system administrators and troubleshooting technicians. On the first issue of availability, LMSs are largely rooted in an (increasingly erstwhile) web-based paradigm, having often evolved since their inception as web pages and web systems. With the emerging phenomenon of mobile device adoption, Apple iOS and Android-based smartphones, tablets, and the corresponding burgeoning market of "apps" has become the new platform of choice for consumers, especially younger students. As such, LMSs will need to adapt (or perhaps entirely re-envision) their products to accommodate this preferred interface. Adopting these new technologies, and the corresponding philosophy of anytime, anywhere, "any how" mobile access (Hong-Ren & Hui-Ling, 2010; Menefee, Parnell, Powers, & Ziemnowicz, 2006) is crucial for LMSs moving forward. To be sure, like general consumers at large in broader markets, students and professors will likely continue to expect access to crucial data, social circles, and the corresponding communications involved therewith, from the mobile

platforms through an integrated process. As well, expectations continue to increase with regard to uptime, continued ease-of-use, and best practice in modern user interfaces.

Live customer support of LMS systems, given their critical nature, is continually held to scrutiny and can become a key differentiator among producers of such systems. By and large, along with software systems in general, it appears that LMSs are responding, as evidenced by delivery of increasing service levels and facilities for students, institutional administrators, and instructors.

Visibility

While it is ostensibly crucial for students, teams, cohorts, professors and other members of a learning community to find and interact with one another *within* a system (i.e., the private side of a platform), the need to have a public side, for purposes of marketing and networking, is especially important for students of entrepreneurship and their corresponding programs. However, currently the valuable aggregation of assets, work outputs, credentials, artifacts, and even threads of interaction and conversation that occur internally on the private side of an LMS, whether in whole or in part, cannot readily be made to "cross the gap" into the public sphere of "big data" (i.e., indexed, *Google* searchable information). In other words, internal visibility appears to have been (and continues to be) the priority for LMS providers.

What is developed and built behind the firewall of LMSs, while often robustly visible to constituents within that private system, stays behind the firewall, and unfortunately some work that probably could be shared to the benefit of students and members of a business community at large never sees the "light of day." Therefore, this material cannot serve as valuable reputation-building collateral for students, their institutions, or their nascent business ventures. Contrast this with modern social networking platforms like *LinkedIn* that allow users to effectively "export" select (and likely flattering) elements of their professional profiles, assets and conversations to the public, quickly and easily, while keeping other material selectively available or completely private.

Consistency

Since many institutions probably take a "hodgepodge" approach to adopting multiple technologies as part of their system, users can be left bewildered, confused and likely dissatisfied with the experience. In particular, communications and learning assets can be strewn across multiple technologies (e.g., the LMS proper, email, text messages, file repositories like *DropBox* etc.) whether it is the intention of educators or not. Students and faculty, like any consumers of technologies, often seek the path of least resistance and most fluid response in their choice and use of collaborative software systems. With current LMS offerings, simply keeping track of one another, not to mention the trail of materials associated with that attempt, is a challenge. Social media and corresponding cloud-based, seamless applications, have emerged as a solution that can accommodate such possibilities.

Indeed popular platforms such as *Facebook* and *LinkedIn* are specifically effective tools in this arena, but for the most part they are "out there" (extraneous to the academic ecosphere) and usually utilized because someone took initiative on their own to use these as tools. In other words, universities often lose contact not with people *per se* (development offices often do an amazing job of keeping in touch and soliciting), but rather with the ability to maintain deeper

personal relationships. Students move on and purposefully retaining them through robust social networking technologies could be mutually beneficial and impact curriculum, pedagogy, and marketing (Hansen, 2004; Trim, 2003).

Social media platforms also have limitations as learning management systems. For instance, as was determined through research findings reporting an effort to use *Facebook* as a LMS:

> Facebook is a popular social networking site. It, like many other new technologies, has potential for teaching and learning because of its unique built-in functions that offer pedagogical, social and technological affordances. In this study, the Facebook group was used as a learning management system (LMS) in two courses for putting up announcements, sharing resources, organizing weekly tutorials and conducting online discussions at a teacher education institute in Singapore. This study explores using the Facebook group as an LMS and the students' perceptions of using it in their courses. Results showed that students were basically satisfied with the affordances of Facebook as the fundamental functions of an LMS could be easily implemented in the Facebook group. However, using the Facebook group as an LMS has certain limitations. It did not support other format files to be uploaded directly, and the discussion was not organized in a threaded structure. Also, the students did not feel safe and comfortable as their privacy might be revealed. (Wang, Lit Woo, Lang Quek, Yang, & Liu, 2012, p. 428)

Nevertheless, useful attributes of broader social media platforms do not appear to have been integrated into LMSs (e.g., Blackboard), despite the opportunity that such integration presents in helping solve the "consistency" problem. Rather, in what seems like an attempt to accommodate the desire among users to leverage such features, LMS producers have recently appeared to show interest in imitating elements and some functionality of social media.

However, despite mimicking attributes of popular social media like *Facebook* and *LinkedIn*, these proprietary implementations are ultimately and unfortunately "closed" within their respective systems (whereas much of the benefit of the social integration which they achieve should in fact occur *without* the academic environment). As such, they do not integrate into the broader, popular and publicly available social media platforms. This appears to be happening in spite of the abundance of fluid APIs and technology support for integrating popular extant social media platform functionality into existing, proprietary systems.

Integrated Single Platform (Gateway)

Attempts to leverage technology in distance education entrepreneurship programs have resulted in deployment of a wide cross-section of tools. Namely, students and faculty typically must enter one system for email, another system for discussion board/forum type activities, perhaps even another for a repository of course-related, server based files, and yet another for grade and instructor-student feedback. Moreover, many of these systems used for discrete activities have begun to afford cross-functionality, such that the Learning Management System used by a university might provide (duplicate) private messaging services, akin to email. As well, there are many competitors in the virtual web conferencing software (e.g., *Skype*, *GoToMeeting*), which often stands alone and apart from other systems (e.g., LMSs). As mentioned, of importance is the "portal" or gateway effect of having a single, outward-facing interface to end users and, even more conveniently, a single sign-on. Currently, LMSs or similar providers have offered neither a single platform nor a single gateway that aggregates platforms.

Interpersonal Networking Capabilities

While availability of and constant improvements on virtual meeting spaces and community tools have been a mainstay of popular social networks such as *Facebook* and *LinkedIn*, LMSs still find themselves woefully behind in this regard. Of note, while LMSs certainly offer such functionality, they do not do so in an easy-to-use fashion. Witness the difference between the relatively seamless and user-friendly "status update" mechanisms of popular social media "news feeds" and "life streams" (which by design invite users to post information, comment on one another's posts, quickly add media and attachments, take conversations public or privately quickly, etc.) versus the "average" entry page for LMSs, which typically require awkward navigation to "deep linked" interpersonal networking tools. Akin to social media news feeds, additional tools like *Twitter* (Domizi, 2013) and other widely used messaging services are more robust than the mass email, private discussion forums and similar functionalities that are built in to most LMSs.

Perhaps owing to the majority demand of broader academic constituents (e.g., history, literature, science departments), who may or may not need to value interpersonal networking (O'Donnell, 2004) to the same degree as students of entrepreneurship, LMSs have generally exhibited a "nice to have" or "tack on" philosophy toward such tools. While meeting the demands of the "student and instructor masses" (JarmÉUs et al., 2012; Ralph & Stahr, 2010; Sánchez, Salinas, Contreras, & Meyer, 2011) which do, naturally, tend toward the average, such platforms again fail to meet the unique needs of distance education entrepreneurship programs in that they cannot be adequately likened to tools that would be used as students embark upon their future entrepreneurial pursuits.

That is, in this latter context, as entrepreneurs they very likely will need to leverage blogs, *LinkedIn*, *Facebook*, *Twitter*, virtual meeting tools, and myriad other technologies that without instructor intervention or students' own personal initiative, would not be part of their academic experience. In other words, their entrepreneurship education would exclude exposure to the tools that these students will probably use, need to use, or benefit from using in the real world.

Longevity and Legacy

The ultimate expiration of valuable learning assets, conversation threads, user profiles and other records that are artifacts of student work and interaction poses a hindrance to the long-term potential benefit of a distance education entrepreneurship experience. Typically upon completion of a program or degree, students are no longer able to access LMSs and the materials, people and opportunities contained therein. This short "shelf life" also has implications for previously mentioned career networking and publicly-facing marketing opportunities. For example, an excellent "virtual" business plan (perhaps for a venture that was imagined, but never realized by a team) created several semesters ago is, unless overt action is taken by participants, lost forever.

At minimum, it is accessible probably only to administrators or professors. To transfer the information to a usable platform, while certainly possible under these conditions, is not at all easy to do, as earlier mentioned. The abbreviation of the life of these materials and associated interactions ultimately detracts from the broader sense of identity and community that could be

created in an imagined different situation: one where an accretion of prior work and community serves as the "base camp" for an entire program, cohort or community.

Promotion

Achieving integration into the "ideal" platform as described here would likely present considerable marketing opportunities not only for students, as has been described vis-à-vis enhanced networking capabilities, but also for program administrators, departments, colleges, and universities. At issue is the ability to not only present to publics (including potential students) a largely superficial website replete with proper branding ("ASK? NAJ," 2006) and carefully written ad copy, but also a properly controlled (but easy-to-use) portal into learning assets, appropriate parts of professor and student profiles, and conversation threads identified as appropriate for public consumption.

Currently, tools like blogs (Lahm Jr, 2006)—which by nature are intended to be publicly facing instruments and it has been argued an almost indispensible tool for entrepreneurial firms—while often resident as a function inside LMSs, are not readily "exportable." Under the current regime of LMSs, it could be argued that few students, especially entrepreneurship students who are likely steeped in modern, flat and flexible, cloud-based integrated systems (Lawrence & Chang, 2010) such as *Basecamp* and *Zoho*, would necessarily be impressed by the offerings.

Many features that would lead to a well-supported, highly visible, consistently presented, single platform that easily integrates secure areas with public facing areas for professional networking, all while staying accessible for the long haul, is something that readily exists in the realm of many areas of productivity software, not the least of which includes social media (Hsiu-Ting & Steve Chi-Yin, 2010). But, to date, the availability of such in the market of LMSs has not been realized, thus nor has the opportunity to leverage such a platform to tout the efficiency and effectiveness of a distance education entrepreneurship program.

BARRIERS TO IMPLEMENTATION OF EIGHT-POINT FRAMEWORK FOR BEST PRACTICE

Our suggested eight-point framework portends several opportunities for improving distance entrepreneurship education, but barriers to implementation clearly exist. These barriers generally fall under three areas, which include limitations of the following: LMSs, instructors, and institutions (see Table 1). Each of these categories will be discussed in turn, with attention given to the individual barriers.

Table 1:
Suggested Barriers to Implementation by Category

LMSs	Instructors	Institutions
Lack of usability testing	Underdeveloped appreciation of "open source" model of pedagogy and research	Lack of funding
Lack of integration in keeping with current trends in technology	Aversion to change due to issues of workload, burnout	Lack of adequate training resources
Long-term contracts and negotiated service levels	Curricula that do not take advantage of existing or potential LMS technology	Legacy of focus on brick and mortar infrastructure as compared to "virtual infrastructure"

Difference in revenue models vs. mainstream Social Network Systems (SNSs)	Lack of intrinsic motivation to adopt new systems	
Natural tensions between design complexity and user simplicity	Lack of extrinsic rewards to adopt new systems	

LMSs

Popular Learning Management Systems have developed organically over time, as much software does. As such, original functional requirements which drove the initial incept of these systems have predictably blossomed as producers of LMS software continue to attempt to meet the needs of educators and the users to whom courses are disseminated with these LMSs as the means of distribution. However, as per our given framework for best practice in this manuscript, much progress is still necessary. Also, the world does not stand still relative to these systems' operating environments. For example, bandwidth capacity increases on the part of ISPs (Internet Service Providers) at large have enabled more video and audio streaming. Changes in browsers, introduction of new browsers, a proliferation of browser add-ons (and their potential security and compatibility issues), the advent of mobile computing with tablets, smartphones and other devices, and numerous other changes in an extremely dynamic operating environment do present a constant set of challenges and opportunities.

Owing to a need to keep up, it appears that usability testing, a common procedure in mainstream software development, could be lacking on the part of most LMSs. From the perspective of the authors, usability testing of LMSs appears limited to nonexistent as evidenced by our regular documentation of a significant number of awkward and often prohibitive limitations of some of the most popular LMSs. While this process of documentation has entailed an informal approach including screen recordings, screenshot captures, and the collection of qualitative data, these are not "bugs" inasmuch as they are often egregious and glaring oversights in functionality and user interface—issues which have typically already been resolved in mainstream groupware and communication software packages. As a shining example, a current edition of Blackboard fails to allow users to copy and paste from even plain text source files and the popular word processor Microsoft Word without suffering an array of formatting issues, whereas many other platforms have solved or significantly mitigated such problems with smart paste functionality.

To this end, by all appearances few lessons are being learned from current trends in modern communications technologies like social media, which have continuously improved in terms of the means by which they have increasingly allowed users to easily collaborate, communicate, coordinate, and network interpersonally. By all means, the "trappings" or outer appearances of social media have started to make their way into the interfaces of some LMSs. However, the core and highly useful functionality (and reason social media are so popular) such as the "Newsfeed" update (familiar to users of *Facebook*, *Myspace*, *LinkedIn*, etc.), is still nowhere to be found among LMSs.

From an administrative standpoint, long-term contracts and all of the limitations that accompany such arrangements, including service level provisions or the lack thereof in terms of their adequacy, are also a barrier. As it stands, schools are at the mercy of the tools they sign on to use. Similar to long-term cellular phone contracts which lock users in despite potentially poor service (or lack of ability to upgrade their phones), this results in much dissatisfaction and, importantly, a dis-incentive on the part of the producer to make headway in terms of listening to

customers' wants and needs. In order to provide internal and external support for existing LMSs, typically universities—for the sake of efficiency—adopt a given system (i.e., brand) of LMS. Providers of these systems may offer the system itself, support, upgrades, hosting, training, and other benefits to university clients, and to ensure the continuity of such services contractual arrangements would also be typical. Hence, it is mutually desirable for both providers and universities to obligate themselves to one another for a sustained period of time.

Ultimately, the barrier to steadfast innovation (that emulates mainstream software development in terms of testing and functionality) could be attributed to the significant differences in revenue models between education-oriented LMSs and popular, mainstream market communication tools and collaborative systems. As most social media work toward deeper and more effective integration into the communication and lifestyle arcs of their constituent consumers, they do so in effect to sell ads in a more clever fashion. No such incentive exists on the part of LMS producers and, as such, nor does the incentive to innovate in a similar fashion.

We also acknowledge a natural tension between the design complexity of any technology and a need to create user simplicity. It is a constant that human beings are in need of systems that are easy enough to use while also sometimes delivering performances in the background that are massively complex. Speech recognition is one such example of a very complex technology that has evolved over the years and is still evolving. Users merely want to talk while these systems do the typing. Users measure success by virtue of accuracy (despite accents, changes in the user's voice pattern based on an illness, for instance). Yet, the programming underneath such speech recognition relies on extremely complex algorithms. LMSs are already difficult to use as students report, and as instructors may quickly discover upon adopting them (or being told to use them) for the delivery of instruction. Nevertheless, they are sorely in need of further development.

Instructors

Barriers exist as well in terms of instructors' adoption and deployment of LMSs. Even under the best conditions (i.e., a system that adheres to the "ideal" outlined in this paper, as per the eight-point framework), many instructors are, quite simply, reluctant to change. Understandably, people are often averse to constantly adopting new systems and undergoing the training and re-training necessary in order to prepare to use such systems. As well, germane to the argument made in this paper, entrepreneurship professors may not cohesively agree on the importance of learning communities and the short- and long-term benefits that come with such a network. In the end, due to this aversion to change, which could be a result of burnout, extensive workload, other priorities, or just obstinacy in general, "internal" barriers are at play as much as the largely "external" ones explicated in the previous section.

Moving from individual instructors to instructors as a constituency, namely as part of programs, departments, colleges and universities, may not be in a "culture of change" with regard to curriculum overhaul. To be sure, the "ideal" LMS outlined in this paper has endemic implications. As such, it is not an "additive" supplement to an extant curriculum, but might be viewed as an "ecological" or systemic force for change. Whether or not colleagues, program directors, department heads/chairs, support personnel and administration are "on board" with adopting such a profound juggernaut of disruption have a direct impact on success and, therefore, serve as individual and collective barriers.

Institutions

Other external barriers exist at the level of the institution. As has been mentioned earlier in this paper, a plain and simple lack of funds could serve as a barrier, even in light of being presented with the "ideal" (and, we admit, likely expensive) LMS. Even where funds exist, unless at an institutional level an "audit" and deep-dive investigation into the needs of faculty for an LMS, including potentially idiosyncratic ones like those outlined here for an entrepreneurship program, there might simply be no awareness, no agreement on needs, nor the base justification for the need for a better system. Where these needs are defined, it is often at the level of faculty support groups or "teaching centers." A less than optimal or lack of institutional cohesion and collaboration between these groups and ultimate end users (i.e., faculty and instructors) could stand as a significant barrier.

From a marketing point of view, and relative to some public-facing ramifications of the socially networked constituencies with which institutions interact, there appears to be tremendous conflict at a policy level. This is true in the private sector world as well. Many organizations still seek to control social media conversation by limiting access or otherwise governing what participants—in particular employees—might say. Yet, as most faculty acknowledge, smart phones, tablets, and other devices are a constant in terms of classroom ubiquity in the brick and mortar environment, as students are actively engaging in all manner of social media interactions. In other words, there is a conversation out there that institutions may wish they could control, but they cannot. Thus, institutions may need to recognize that "control" means joining the conversation, conveying a reasonable point of view, and being perceived as worthwhile value-creators by a majority of discussants.

Institutions must also, at a broad and more abstract level, have an understanding of the impact of the need for change in infrastructure from legacy brick and mortar orientation to that which would facilitate distance delivery of courses and programs. Despite the rapidly changing face of education and a spoken acknowledgement of distance education as being very much associated with the future of education, facilities planners, for instance, may only acknowledge hardware infrastructure needs such as pulling cable, routers, and so forth. However, new "virtual infrastructure," including that of an "ideal" LMS, has resounding and replete ramifications on other infrastructure, course preps, pedagogical philosophy at large, intensity, mode and quality of course delivery, etc. Public institutions are doing a poor job at changing business processes. It is well-known that teaching distance courses can be significantly different in terms of imposing a greater workload on faculty (yet we see little evidence of accommodation relative to standard 3-3 to 4-4 loads for undergraduate teaching). As we write this, to bring an example of a process not ready for "distance delivery," a student has just messaged, needing our original signature for a paper form in connection with an online, distance course. As we have pointed out to administrators, we are working at a distance, too.

CONCLUSION

The distance education landscape at present is comprised of a cobbled-together approach as institutions and their respective programs adopt and learn to utilize both front facing (i.e., public) and student–facing (i.e., private) technologies. Further, new ones are evolving at a rate that often outstrips the ability of faculty ("Course Quality and Instructor Workload: Pt. 1," 2005;

Finney, 2004) and institutions as a whole to keep up. Yet, because entrepreneurship programs must pursue the development of holistic learning communities that enable the cultivation of not only traditional skills and knowledge within the discipline, but perhaps just as importantly the social capital necessary to succeed as new venture leaders, they should leverage technologies and push for the development of platforms that blend the functionality of social networking sites as well as learning management systems. Research to date in this regard is limited, as is the case with the tools for doing so. The current work hopes to serve as a springboard for such research, providing a framework for consideration and modification, and, at minimum, an exhortation to discuss what could be "a better world" for entrepreneurship pedagogy.

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CULTIVATING BLACK TECHNOLOGY ENTREPRENEURS THROUGH HBCU ENGINEERING & BUSINESS PROGRAMS

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ABSTRACT

In today's society, the black community is suffering from high unemployment rates and low levels of entrepreneurial activity. The phenomenon of technology entrepreneurship has dominated the discussion as a solution to business creation and job growth. As a result, many top-tier academic institutions have incorporated a focus on entrepreneurship within their engineering programs, in addition to a technology-oriented focus on entrepreneurship in business programs. To assess the involvement of historically black colleges and universities HBCUs in the promotion of entrepreneurship, a review of accredited engineering and business programs was conducted to identify the existence of an entrepreneurship focus. Based on the findings, it was concluded that entrepreneurship education is relatively nonexistent within HBCU engineering programs. However, the majority of HBCU business school programs offer entrepreneurship courses in varying forms. Suggestions to increase the entrepreneurship focus in HBCU engineering programs are offered as a means to address elevated unemployment and diminished technology entrepreneurship in the black community. Practical implications and considerations for future research are also discussed.

***Key Words**: HBCU, engineering, entrepreneurship, education, job growth, black unemployment*

INTRODUCTION

Entrepreneurs, new venture creation, and the small business sector significantly contribute to the U.S. economy (Reynolds, Carter, Gartner, & Greene, 2004; Schumpeter, 1934), with some estimates crediting entrepreneurial activity being responsible for half of U.S. GDP (Cornwall, 2008). To this end, new ventures and small businesses have created most of the net new jobs in the U.S. economy over the last several decades (Birch, 1987; Kirchoff & Phillips, 1988; Scarborough, Wilson, & Zimmerer, 2009; Van Stel & Storey, 2004). Last year was no different. In 2012, businesses with less than 500 employees hired more workers than businesses with 500 or more employees. The highest number of total jobs was found within the group of businesses with less than 20 employees (U.S. Census Bureau, 2013).

While the unemployment rate remains high among all Americans as a result of ongoing global economic weakness, it is particularly high within the black community. In 2012, among

all racial groups, the highest total rate of unemployment was found in the black population (13.8 percent). This was far higher than the unemployment rates within the white (7 percent) and Hispanic (9.7 percent) populations (U.S. Department of Labor, 2013). Improving the rate of entrepreneurship within the African American community is particularly important when one considers that over the last five decades, the unemployment rate within the black population has consistently remained about double that of white Americans (Badgett, 1994; Hoynes, 2000; Spriggs & Williams, 2000).

Given the high rates of unemployment and the lower labor participation rate of blacks, scholars such as Bates (2006) argue that the formation and expansion of black-owned ventures is a viable strategy to address the persistently high black unemployment rate. However, research has consistently found that the new venture creation and self-employment rates of blacks are lower than those of other racial groups in the U.S. (Bradford, 2003; Butler, 1991; Ede, Panigrahi, & Calcich, 1998; Fairlie, 1999; Fairlie & Meyer, 2000). Research has also found that blacks exit out of entrepreneurship at higher rates than entrepreneurs of other races in the general population (Fairlie 1999). So, not only are there fewer African American entrepreneurs per capita, but these entrepreneurs are less likely to be successful than their white counterparts.

To understand the reasons for the disparities in black and white entrepreneurship, research has focused on such things as household income (Fairlie, 1999), educational achievement (Hisrich, Peters & Shepherd, 2005; Singh & McDonald, 2004), and family structures (Dunn & Holtz-Eakin, 2000; Lentz & Laband 1990). Obviously, exploring the unique social characteristics, economic factors, and entrepreneurial processes of black entrepreneurs (see Crump, 2008; Ogbolu, 2011; Singh, Crump, & Zu, 2007) is important; however, in this paper, we go beyond these issues that have been explored and focus on technology entrepreneurship and the role that HBCUs can play in spurring entrepreneurship through engineering programs.

While future economic growth is expected from a wide array of sectors, the technology sector is expected to account for one quarter of high-growth firms (Motoyama & Danley, 2012). The anticipated increase of high-growth firms in the technology sector will create a significant portion of new jobs moving forward (Stangler, 2010). Given the disproportionate rates of black unemployment and successful entrepreneurship discussed above, a remedy for this issue can be found by increasing the level of entrepreneurial activity among blacks within the technology sector, especially given the anticipated growth in the number of technology-based firms.

In order to encourage technology entrepreneurship within the black population, we argue that emphasis can be placed on the education of black engineering students. Researchers have identified relationships between entrepreneurship education, entrepreneurial intentions, and new venture creation (Sanchez, 2011; Souitaris, Zerbinati & Al-Laham, 2007). For example, in their study on the impact of entrepreneurship education within a group of engineering and science students, Souitaris, Zerbinati and Al-Laham (2007) found that entrepreneurship courses inspired students to become business owners, leading to increased entrepreneurial intentions. Also, according to a study conducted by Sanchez (2011), participation in an entrepreneurship course was found to exert positive influence on students' entrepreneurial intentions.

Many universities currently offer entrepreneurship education, primarily through schools

of business, and as observed by Singh (2008), there is a growing prevalence of programs and courses focused on entrepreneurship at the collegiate-level. Additionally, students pursuing technical degrees are being exposed to entrepreneurship, as many top-tier academic institutions have incorporated a focus on entrepreneurship within their engineering programs (Standish-Kuon & Rice, 2002). Although several academic institutions provide some degree of entrepreneurship education to engineering students, many institutions have yet to introduce an entrepreneurship focus in their engineering programs (Waters, 2010). Minority serving institutions, specifically historically black colleges and universities (HBCUs), have also been cited as lacking a focus in technology entrepreneurship (Holifield, 2011; Lesesne, 2013).

In order to promote technology venture creation within the black community, courses in entrepreneurship should be available at the institutions serving this demographic group. Recognizing that 40 percent of black engineering graduates hail from HBCUs (U.S. Commission on Civil Rights, 2010), ensuring access to entrepreneurship education for these students may positively impact the rates of black technology entrepreneurship. Knowing that black business owners are inclined to employ workers of the same race (Bates, 1994; Bates, 2006; Walstad & Kourilsky, 1998), the progression of black technology entrepreneurs has the potential to significantly influence and reduce future unemployment rates.

In light of the discussion above, we discuss the role of HBCUs in promoting entrepreneurship. More specifically, we focus our attention on black technology entrepreneurship and the efforts of HBCUs to provide entrepreneurship education to engineering students. HBCU engineering programs are investigated to assess the presence of course offerings in entrepreneurship and some evaluation of these programs is made. Following the discussion of our findings, practical implications and broad suggestions for improving access to entrepreneurship education at HBCU engineering schools are provided, and considerations for future research are offered.

THE CURRENT STATE OF BLACK TECHNOLOGY ENTREPRENEURSHIP

Unlike some industries that may be dominated by white males, new firm creation in the technology sector has occurred from various demographic groups, and immigrant entrepreneurs primarily descending from India and China have maintained a strong entrepreneurial presence, especially in Silicon Valley (Saxenian, 1999). From 1995 to 2005, immigrant entrepreneurs were involved in founding more than one quarter of the nation's engineering and technology firms, and accounted for 450,000 jobs (Wadhwa, Gereffi, Rissing, & Ong, 2007). Since 2006, immigrant entrepreneurs from India founded more than one third of the nation's technology firms, followed by other Asian immigrant groups (Wadhwa, Saxenian, & Siciliano, 2012). Even though some minority groups are actively involved in creating technology ventures, black Americans maintain a disproportionately low rate of involvement in technology sector entrepreneurship. Data from a CB Insights (2010) research report highlights the racial background of founders whose firms received venture capital support. In the first half of 2010, whites owned 87 percent of these firms, followed by Asians (12 percent) and blacks (1 percent). The problem is likely due to the fact that there are so few technology-based new ventures that are

being created by black entrepreneurs.

Recent popular press articles discuss the lagging rates of black technology entrepreneurship in spite of several efforts to remedy the issue and spur minority business growth (Gage, 2012; Klein, 2013). Further evidence of the low participation rates of blacks in technology entrepreneurship is presented through to data obtained from the U.S. Census Bureau Survey of Business Owners, which is published every five years and highlights various characteristics of U.S. businesses. In the 2007 survey, the percentages of black-owned firms in the healthcare (15.4%) and transportation (13.4%) sectors where shown to be much higher than the ownership rates in the information (6.2%) and technical services (4.3%) sectors (U.S. Census Bureau, 2012). The survey findings align with the overall perception that the involvement of blacks in technology firm ownership is disproportionately low, but not surprising given that blacks maintained a seven percent ownership rate among all U.S. businesses (U.S. Census Bureau, 2012).

Due to the high expectations for growth in the technology sector, there are obviously significant benefits to forming technology-based ventures. Perhaps most notably, there is significant funding available. Data from the National Venture Capital Association (2012) shows more than $28.7 billion in funds were invested by venture capitalists in 2011. While venture capital expenditures were spread across various industries, the most attractive avenue for venture capital investment lies within the technology sector (Ernst & Young, 2012). If black entrepreneurs engage in entrepreneurship within the technology sector, they may benefit from the heightened flow of venture capital funds; especially considering that access to financing is often cited as a barrier for black entrepreneurs (Lucas, 2006; Robb & Fairlie, 2007).

Research has shown support for the role of education in black nascent entrepreneurship (Reynolds *et al*., 2004; Singh & Crump, 2007). Improving the current state of technology business ownership within the black population may be possible through effective education about entrepreneurship and entrepreneurial processes to this demographic, and HBCUs are positioned to be primary drivers of this change. The importance of education and the role that HBCUs can play in promoting technology entrepreneurship are discussed below.

ENTREPRENEURSHIP EDUCATION AND ENGINEERING PROGRAMS

Historically, academic institutions have played an important role in providing entrepreneurship education to the next generation of entrepreneurs. The late 1800s formed the beginning of U.S. entrepreneurship education (Katz, 2003), and tremendous growth in the number of entrepreneurship course offerings has occurred since the 1980s (Katz, 2003; Kuratko, 2005; Singh, 2008).

Results from the Panel Study of Entrepreneurial Dynamics (PSED) suggest that the education of nascent entrepreneurs impacted their involvement in new venture creation (Reynolds *et al*., 2004). Nascent entrepreneurs with higher levels of formal education engaged in startup activity at higher rates. From an ethnicity perspective, education had a more pronounced effect on the startup activity of minority groups (African Americans, Hispanics) when compared to Caucasians (Singh & Crump, 2007).

Education is not only limited to influencing entrepreneurial intentions and activity, it has been linked to firm performance. According to Wadhwa, Freeman, and Rissing (2008), entrepreneurs with a college education achieved higher firm revenues than entrepreneurs without a college education. This has been especially true of education specifically focused on entrepreneurship (Sanchez, 2011). Elmuti, Khoury, and Omran (2012) identified a positive link between entrepreneurship education and the performance of business ventures, through a survey of existing business owners and nascent entrepreneurs. Further, Colombo and Grilli (2005) determined that entrepreneurs with education related to business and technology experienced higher growth in technology-based firms.

Traditional engineering education has primarily focused on preparing students to obtain careers in their respective fields. Upon completing their degree, students are equipped with the technical background necessary to achieve success in various engineering-related industries. Well-educated engineering students may even find themselves gainfully employed during times of economic recession. In addition to pursuing engineering careers, engineering graduates are pursuing opportunities outside of the engineering field, such as small firms and startup ventures (Creed, Suuberg, & Crawford, 2002). For these students, the traditional engineering education may not provide them with all of the skills necessary to accomplish this goal, and education in entrepreneurship may help to fill this void (Dabbagh & Menascé, 2006). After surveying over 600 executives of U.S.-based technology firms, Wadhwa *et al*. (2008) found that nearly half of the survey respondents held degrees in engineering and technology. Furthermore, Walker (2012) suggested that universities should offer entrepreneurship courses, as they can encourage the identification and exploitation of entrepreneurial opportunities, potentially leading to commercializable technology. These findings suggest a link between the possession of a technology-related degree and future involvement in technology entrepreneurship, and also highlight the potential ability to create an entrepreneurial culture in academic environments.

Entrepreneurship education has been infused into many of the nation's colleges and universities (Duval-Couetil, Reed-Rhoads, & Haghighi, 2011), including leading engineering schools (Standish-Kuon & Rice, 2002). For example, the Technology Ventures Program at Stanford University (2013) is the institution's business incubation center located in the engineering school. The program focuses on providing technology-driven entrepreneurship education to students, hosts a lecture series with the purpose of exposing students to leaders in technology entrepreneurship, and provides students with actual work experience at Silicon Valley technology ventures through a residency program. Although Stanford's proximity to Silicon Valley may afford certain competitive advantages, there is no debating the university's impact on technology sector entrepreneurship. In 2010, Stanford ranked as one of the top two academic institutions in producing entrepreneurs who received venture capital funding (CB Insights, 2010). From 2007 to 2011, entrepreneurs educated at Stanford raised $4.1 billion in venture capital and angel funds, with nearly 65% of the investments directed towards technology sector firms (CB Insights, 2012).

While some institutions offer entrepreneurship programs similar to Stanford through engineering schools, others take an alternate approach to encouraging entrepreneurship among engineering students. The Technological Innovation: Generating Economic Results (TI:GER)

program at Georgia Institute of Technology (2013) is an example of a program not based in an engineering school. Operating out of the business school, the TI:GER program combines students from diverse backgrounds to form teams focused on technology commercialization. The two-year program is centered on a technological idea identified by a science or engineering doctoral student who is teamed up with students pursuing MBA and JD degrees. This interdisciplinary approach combines expertise from the diverse student backgrounds, with the goal of learning the various steps of taking a product to market. After completing an application process, participants admitted to the program receive a certificate in technological innovation by completing four required courses. Involvement in the TI:GER program has also led some participants to create technology ventures centered on their developed technological innovations.

U.S. News and World Report provides an annual ranking of the top American academic institutions. In their 2012 ranking of top engineering schools, Massachusetts Institute of Technology, Stanford University, and University of California at Berkeley were listed in the top three (U.S. News, 2013). These institutions were also ranked of the top six U.S. schools in terms of the combined amount of venture capital funds raised by alumni in 2011 (CB Insights, 2012). Each of these institutions provides education in entrepreneurship to some degree, and the benefits of entrepreneurship education can be seen in the number of startup firms whose founders are linked to these top engineering schools. Despite the number of institutions where entrepreneurship is encouraged, research shows a small number of engineering schools offering entrepreneurship courses, and nationwide, engineering schools in general are lacking a focus on entrepreneurship education (Waters, 2010). In their review of the entrepreneurship programs at 160 U.S. academic institutions, Streeter, Kher, and Jaquette (2011) found entrepreneurship courses in nearly 90 percent of the undergraduate business programs, but less than half of the engineering programs offered courses in entrepreneurship. This may suggest an opportunity for more institutions to initiate formal efforts aimed at exposing engineering students to aspects of entrepreneurship. If successful, their efforts can potentially increase the number of technology firms created by engineering students educated at these institutions.

HBCUS: THEIR ROLE AND PROGRAMS OF ENGINEERING AND ENTREPRENEURSHIP

According to the United Negro College Fund (2013), the existence of HBCUs dates back to the 1800s, but the formal classification of these institutions, created to serve the needs of black Americans, was defined in the Higher Education Act of 1965. Prior to the desegregation of higher education institutions, HBCUs were the primary avenue for blacks seeking college degrees (Cantey, Bland, Mack, & Davis, 2012). Since desegregation, HBCUs have been in competition with traditionally white institutions, but still remain a significant provider of higher education opportunities to black students (Palmer, Maramba, & Lee, 2010). Approximately 20 percent of undergraduate degrees conferred to black students in the U.S. are conferred by HBCUs (Palmer *et al*., 2010), and they also account for about 30 percent of black science, technology, engineering and math (STEM) graduates (Perna *et al*., 2009). In addition, HBCUs are credited with producing most of the black graduate and doctorate degree-seeking students

(Gallo & Davis, 2009).

The societal contribution of these institutions can be seen through data provided by Fryer and Greenstone (2007), which states that "among blacks, 40 percent of all congressmen, 12.5 percent of CEOs, 50 percent of professors at non-HBCUs, 50% of lawyers, and 80% of judges are HBCU graduates" (p. 1). However, in recent years, HBCUs have been plagued with a myriad of issues, including financial troubles due to declining enrollment and reduced revenues (Gasman, 2009), and fundraising challenges due to the low levels of alumni giving (Williams, 2010; Williams & Kritsonis, 2007). These issues have resulted in researchers and media pundits suggesting the mission of HBCUs is irrelevant, and that they are no longer necessary (Goode, 2013; Turner, 2011). In fact, the value proposition of HBCUs has been the subject of increased scrutiny (Cantey *et al*., 2012).

In light of the challenges faced by HBCUs, and concerns regarding their purpose, an opportunity to quell the questioning of their relevance exists in championing efforts to reduce black unemployment through business creation. Leaders of these institutions can enact measures to create a culture of entrepreneurship and increase student engagement in new venture creation, leading to a potential escalation in the number of students engaging in business ownership. To assist the development of minority businesses, Adebayo, Adekoya, & Ayadi (2001) propose that HBCUs embrace entrepreneurship education, create centers for business incubation, and facilitate networking between business owners and potential investors.

Given that the rates of black entrepreneurship lag behind the rates of entrepreneurship among whites (Köllinger & Minniti, 2006), the residual effects of an entrepreneurship culture at HBCUs may lead to an increase in the number black-owned firms and jobs available to black workers. In addition, research has shown that student-led startups tend to be physically located in the communities surrounding academic institutions, and these firms positively influence local economic development (Astebro & Bazzazian, 2010). By encouraging entrepreneurship across the university, HBCUs may also improve the economic standing of the local communities in which they serve. Over time, if HBCUs are able to positively impact economic development in the black community, skeptics may refrain from debating the value of these institutions.

For 2011, data from the American Society for Engineering Education showed that blacks received 4.2 percent of the 83,000 awarded bachelor's degrees, 4.9 percent of the 46,940 awarded master's degrees, and 3.5 percent of the 9,582 awarded doctorate degrees (Yoder, 2011). Also, of the top 20 institutions graduating black engineers at the undergraduate level, HBCUs accounted for 45 percent of these schools. As they account for a significant proportion of blacks in engineering and technology, HBCUs have the potential to improve the involvement of this group in technology entrepreneurship. Through education focused on teaching entrepreneurial skills and processes, research supports the resulting effects of increased entrepreneurial intentions and firm creation (Mueller, 2011; Sanchez, 2011; Walker, 2012). Support also exists for the relationship between earning a technical degree and business ownership, as Wadhwa *et al*. (2008) revealed 92 percent of technology firm founders held at least a bachelor's degree, and a third of the degrees were in engineering.

Given the prior discussions on the role of HBCUs in black education and employment, the importance of education in entrepreneurship, and the lack of black technology entrepreneurs,

our focus now shifts to examining the current involvement of HBCUs in providing access to entrepreneurship education.

The White House Initiative on HBCUs maintains a list of 101 accredited HBCUs (U.S. Department of Education, 2013a), and the National Center for Education Statistics also identifies 101 academic institutions that maintain the specialized mission of HBCUs (U.S. Department of Education, 2013b). Both lists included four-year colleges and universities, as well as two-year community colleges and other specialty schools. Our comparison of the two lists found that Hinds Community College in Utica, MS was missing from the NCES list, and Shorter College was not included in the White House listing. Based on these lists, we found that there are a total of 102 HBCU institutions.

With the focus of this paper directed towards engineering schools, a list of bachelor's degree granting HBCUs recognized by the Accreditation Board for Engineering and Technology (ABET) in 2012 was obtained. ABET (2013) is regarded as the premier global accrediting body for engineering, technology and computer science programs in the U.S. The engineering programs of 526 academic institutions were found to maintain ABET accreditation. Cross-referencing the ABET schools with the list of accredited HBCUs resulted in the identification of 22 ABET-accredited HBCUs, which was approximately 21.6 percent of all HBCUs and 4.2 percent of the total ABET-accredited population (see Table 1).

Table 1
LISTING OF HBCUS WITH ABET ACCREDITATION
ABET Accreditation (n = 22)

Alabama A & M University	North Carolina A & T State University
Central State University	Prairie View A & M University
Fayetteville State University	Savannah State University
Florida A&M University	South Carolina State University
Grambling State University	Southern University and A & M College
Hampton University	Tennessee State University
Howard University	Texas Southern University
Jackson State University	Tuskegee University
Mississippi Valley State University	University of the District of Columbia
Morgan State University	Virginia State University
Norfolk State University	Winston-Salem State University

The potential for partnerships between engineering and business schools within HBCUs led to the inclusion of business schools in our review. A list of U.S. schools that have attained accreditation from the Association to Advance Collegiate Schools of Business (AACSB) was also obtained (AACSB, 2013). AACSB is an international organization responsible for granting accreditation to business schools. The list included 494 schools with AACSB accredited business programs. A comparison was made between the list of HBCUs and AACSB accredited schools. The comparison revealed 23 AACBS-accredited HBCUs, accounting for 4.7 percent of the AACSB-accredited population and 22.5 percent of all HBCUs (see Table 2).

Table 2 LISTING OF HBCUS WITH AACSB ACCREDITATION AACSB Accreditation (n = 23)	
Clark Atlanta University	Prairie View A & M University
Delaware State University	Savannah State University
Elizabeth City State University	South Carolina State University
Fayetteville State University	Southern University and A & M College
Grambling State University	Southern University at New Orleans
Howard University	Tennessee State University
Jackson State University	Texas Southern University
Morehouse College	Tuskegee University
Morgan State University	University of Maryland Eastern Shore
Norfolk State University	Virginia State University
North Carolina A & T State University	Winston-Salem State University
North Carolina Central University	

Out of the total number of HBCUs, 10 schools offering bachelor's degrees in engineering maintained ABET-accredited and AACSB-accredited programs (see Table 3). These schools form the basis of our review, as the focus is placed on current involvement in entrepreneurship education across HBCU engineering and business schools. Even though courses in engineering and business are provided at many HBCUs, our review focused exclusively on accredited programs to establish a baseline for comparing each of the selected institutions.

Table 3 JOINT LISTING OF HBCUS WITH AACSB AND ABET ACCREDITATION HBCU AACSB / ABET Accreditation (n = 10)
Howard University
Jackson State University
Morgan State University
Norfolk State University
North Carolina A & T State University
Prairie View A & M University
Southern University and A & M College
Tennessee State University
Tuskegee University
Virginia State University

REVIEW OF HBCU ENTREPRENEURSHIP OFFERINGS WITHIN ENGINEERING PROGRAMS

The curricula for the engineering and business programs at each HBCU were evaluated to determine if a focus on entrepreneurship currently exists at the undergraduate level. For the engineering programs, emphasis was placed on the core courses required for all engineering

majors, regardless of discipline. In the assessment of business programs, emphasis was placed on the offering of courses related to entrepreneurship, and whether a formal system was in place that allowed engineering students to gain degree credit for these courses. The review of HBCU engineering and business programs was conducted to assess the current efforts of these institutions, and categorize them into one of three groups. The categories defined in our review were adopted from the classification scheme used by Standish-Kuon and Rice (2002) and Waters (2010). Category A HBCUs offered entrepreneurship courses as a major academic requirement or degree concentration. Category B HBCUs offered entrepreneurship education primarily as a minor academic requirement, or as an elective course. Category C HBCUs did not possess an academic requirement (major or minor) or elective course in entrepreneurship. Additional research was conducted to determine if any entrepreneurship or business incubation centers were in operation at each institution.

A review of the current programmatic offerings of the 10 HBCUs revealed interesting findings about their involvement in promoting entrepreneurship (see Table 4). As a starting point, none of the HBCU engineering programs offer a required or elective course in entrepreneurship. However, half of the engineering schools offer a required course in engineering economics, and one school listed engineering management as a requirement. All but one of the institutions reviewed offer coursework in entrepreneurship.

Table 4
Listing of HBCUs with Entrepreneurship Focus

HBCU	Category	Entrepreneurship Course Offering	School (Bus. or Engr.)	Entrepreneurship Center / Business Incubator
Howard University	B	Mgmt. Conc. (1 Entr. Required, 1 Small Bus. Mgmt. Elective)	Business	Small Business Development Center Intellectual Property Center
Jackson State University	A	Entr. Major (8 Required, 2 Elective)	Business	Small Business Development Center Technology Transfer & Commercialization
Morgan State University	A	Entr. Major (4 Required) Entr. Minor (4 Required)	Business	Entrepreneurial Development and Assistance Center
Norfolk State University	A	Entr. Major (8 Required) Business Minor (1 Entr. Elective)	Business	Ernest M. Hodge Institute for Entrepreneurship
North Carolina A & T State University	A	Entr. Conc. (5 Required) Entr. Certificate	Business	Interdisciplinary Center for Entrepreneurship and E-Business
Prairie View A & M University	B	Mgmt. Entr. Minor (4 Required) Bus. Entr. Minor (3 Required) Non-Bus. Entr. Cert. (3 Required)	Business	Small Business Development Center

Table 4
Listing of HBCUs with Entrepreneurship Focus

HBCU	Category	Entrepreneurship Course Offering	School (Bus. or Engr.)	Entrepreneurship Center / Business Incubator
Southern University and A & M College	A	Entr. Conc. (4 Required)	Business	N/A
Tennessee State University	B	Entr. Minor (4 Required)	Business	N/A
Tuskegee University	C	None	N/A	Youth Entrepreneurial Initiatives
Virginia State University	B	Mgmt. Conc. (1 Entr. Elective)	Business	N/A

Category A: Five HBCUs met the criteria for Category A (Jackson State University, Morgan State University, Norfolk State University, North Carolina A & T State University, Southern University). Each of these institutions offers a major degree program or concentration in entrepreneurship, accompanied by a number of related courses available to business students. Jackson State offers the highest number of entrepreneurship courses, with eight required courses in the entrepreneurship major and two electives. Morgan State is the only Category A school to provide an entrepreneurship minor (four required courses) to students outside of the business school. North Carolina A & T provides non-business students with a certificate option in entrepreneurship through the university entrepreneurship center.

Category B: Four HBCUs were placed in Category B (Howard University, Prairie View A & M University, Tennessee State University, and Virginia State University). This group of schools includes entrepreneurship courses in program curricula as a minor or elective. Prairie View A & M offers a minor degree option with four required courses in entrepreneurship for management students. The completion of three entrepreneurship courses leads to a minor degree for non-management students, and a certificate degree for non-business students. Tennessee State also offers an entrepreneurship minor degree. Open to all majors, the minor requires the completion of four out of six offered courses in entrepreneurship. Howard and Virginia State are the only Category B institutions not offering a minor in entrepreneurship. At Howard, students that select the management concentration are required to complete an entrepreneurship course and have the option to complete an entrepreneurship elective. For students seeking the bachelor's degree in business management, Virginia State offers an elective entrepreneurship course.

Category C: Tuskegee University was the sole HBCU that does not offer courses in entrepreneurship as a major, concentration, minor, or elective.

Entrepreneurship / Business Incubation Centers: The presence of an entrepreneurship center or business incubator exists at nearly all of the HBCUs. In Category A, Southern University is the only institution lacking a center or business incubator for entrepreneurs. Small business development centers are maintained at Howard and Prairie View A & M, two of the four Category B schools. Howard and Jackson State also host centers for technology

commercialization. Although courses in entrepreneurship are not available, Tuskegee (Category C) conducts youth outreach programs directed towards entrepreneurial engagement.

DISCUSSION

Given the lower rate of participation in technology entrepreneurship within the black community (see CB Insights, 2010), additional research is needed to understand how blacks can be encouraged to form technology ventures. The results of our review contribute to the study of entrepreneurship education by highlighting existing programmatic offerings at HBCUs. In general, there is a need for an entrepreneurship focus within engineering schools. This is particularly true for engineering students who attend HBCUs, given the need for job creation in the black community, the rapid growth of the technology sector, and the apparent link between successful entrepreneurship and engineering graduates that was discussed earlier.

A review of the current state of ABET accredited HBCU engineering programs revealed a relatively nonexistent focus on entrepreneurship. However, HBCU business programs exhibited a well-developed focus on entrepreneurship education. Most business schools offered a major and/or minor degree option in entrepreneurship, and provided opportunities for non-business students to earn degree credits through entrepreneurship courses. The review also revealed a number of established entrepreneurship centers and business incubators across each of the HBCUs. Although some traditionally white institutions have embraced entrepreneurship education and business incubation within their engineering and business schools (Standish-Kuon and Rice, 2002), most schools have not (Waters, 2010). Thus, the lack of entrepreneurship courses in HBCU engineering programs is not necessarily surprising; in fact it appears that most schools do not offer entrepreneurship education to engineering students. However, the unique focus, mission, and importance of HBCUs to improving black communities make them an ideal place for promoting and offering educational programs that can spur black entrepreneurship in general, and black technology entrepreneurship more specifically. We believe that such efforts would increase new venture creation, which would help address critics of HBCUs who question their ongoing need by allowing HBCUs to demonstrate their relevance.

Reviewing the ABET educational outcomes reveals accreditation standards that do not require any focus on entrepreneurship (see ABET General Criteria 3: Student Outcomes). Because of this, some may say that since entrepreneurship is not required of engineering students, its inclusion in an academic program would diminish the quality of the education and run afoul of accreditation standards. In stark contrast to the engineering school course offerings, the vast majority of HBCU business schools offer courses in entrepreneurship. It should be noted that AACSB does not require business schools to offer courses in entrepreneurship (see AACSB Accreditation Standards). These courses are often included in curricula due to each member institution's perception about the importance of entrepreneurship education. The point is that ABET accreditation standards which do not require entrepreneurship training for engineering schools should not prevent the inclusion of entrepreneurship courses within engineering schools, because it has not stopped AACSB-accredited schools from doing the same.

Creating an environment in which entrepreneurship education is made available to engineering students may require resources currently not available to HBCUs, especially given the financial hardships faced by some schools. In light of resource constraints, engineering schools at HBCUs can address the lack of an entrepreneurship focus in various ways. Programs offering a course in engineering economics can alter course objectives to reflect learning outcomes related to entrepreneurship. HBCUs that offer entrepreneurship education to business students can allow engineering students to participate in these courses for degree credit. In addition, minor and/or dual degree programs geared toward entrepreneurship can be provided to engineering students. In place of requiring engineering students to take a course in entrepreneurship, such a course could be promoted as an elective, or perhaps a series of entrepreneurship-related courses that constitute an approved minor could be established. Again, this could be done in concert with business programs already at the university. For those HBCUs that do not offer entrepreneurship courses and who may not have entrepreneurship faculty already, engineering programs may be able to recruit resident experts in entrepreneurship to serve as course instructors.

For schools that require students to complete a senior design project, a unique opportunity exists to emphasize entrepreneurship. Taking cues from Georgia Tech's TI:GER program, engineering students can be partnered with business students to form teams tasked with analyzing the technical and entrepreneurial potential of their design project. Combining students from engineering and business backgrounds into courses may even provide unintended benefits in terms of promoting a culture of entrepreneurship. For instance, through their survey of engineering and business students that were enrolled in graduate-level entrepreneurship programs, Berglund and Wennberg (2006) observed that both groups responded differently to tests on creativity. As a result, the authors suggested that entrepreneurship programs containing a mix of business and engineering students would be beneficial to both groups by leveraging their creative differences. The current availability of business incubation and technology transfer programs at select HBCUs can also assist students who desire to use their design to start a business.

In conjunction with educating entrepreneurs, HBCUs can also provide connections to private/public sector entities that are interested in funding student-led startup efforts. Technology startups gain access to financing critical to early firm development through strategic alliances with existing technology firms (Carayannis, Kassicieh, & Radosevich, 2000). Recognizing this benefit, organizations, such as the Google-sponsored NewMe Accelerator based in Silicon Valley, are addressing the low number of black-owned technology startups by assisting black entrepreneurs in forming these critical alliances. NewMe provides a collaborative working environment for minority-owned startups, housing the entrepreneurs in the same facility over a 12-week period. In addition, the entrepreneurs are assigned mentors, and exposed to established Silicon Valley entrepreneurs during their time in the program. This example presents another opportunity for HBCUs to lead the charge in changing the current state of black technology entrepreneurship. HBCUs can utilize their existing business incubators and entrepreneurship centers, or establish partnerships with those within their local areas, to offer a similar program to the NewMe program described above. Beyond helping individual students

grow and learn, such collaboration can build links to the local community that can have many different positive outcomes for HBCUs. These may include access to donors, positive press, and developing goodwill within the local community surrounding the university.

Facilitating the accumulation of entrepreneurial knowledge through work experience serves as another way to encourage technology entrepreneurship among HBCU engineering students, especially considering the link identified by researchers between experience and entrepreneurship. Kourilsky and Walstad (2002) studied the factors motivating high-technology entrepreneurs and found that 75 percent of those surveyed were influenced by prior technology-related work experiences. Given this finding, HBCUs can utilize internship programs to supplement coursework and provide students with opportunities to gain additional education in entrepreneurship through real world experiences. Similar programs exist, such as the Mayfield Fellows Program at Stanford that offers selected students opportunities to intern for technology startup firms.

Professional and technical organizations within engineering schools can also assist in creating an entrepreneurial culture. The National Society of Black Engineers (NSBE), a professional organization supporting students seeking engineering careers, maintains student-led affiliate chapters at many HBCUs. At the national-level, NSBE sponsors various activities related to business ownership through its NSBEpreneur initiative. During regional and national conferences, NSBE hosts a business plan competition, business training workshops and an entrepreneur showcase. By partnering with NSBE, HBCU engineering schools can encourage support of the NSBEpreneur initiative by supporting students to attend NSBE conferences, or hosting NSBEpreneur activities within the university.

Advancing Minorities Interest in Engineering (AMIE), a technical organization based at Morgan State University, also encourages minority participation in engineering careers. Housed within the engineering school, AMIE achieves its goals through a partnership with 14 HBCU engineering programs that maintain ABET accreditation. Given the organization's mission to encourage collaboration among accredited HBCU engineering programs, the group of AMIE-affiliated engineering schools can collaborate to drive the discussion on entrepreneurship education in an effort to cultivate interest in technology entrepreneurship among their students.

Implications

There are significant potential implications of the discussion in this paper. Considering that HBCUs produce a significant percentage of black engineers, providing entrepreneurship education to engineering students within these institutions may be an important way of increasing the number of black-owned technology firms. This can help address the disproportionately low rate of black entrepreneurship. Due to expected technology sector growth, black entrepreneurs can focus their startup efforts on technology-related businesses and better position themselves to secure venture capital funding.

Implications also exist for unemployment and job creation among black Americans. According to Benedict, McClough and Hoag (2012), business owners with a degree in one of the STEM fields were found to be associated with larger-sized firms, employing at least 100

workers. This finding suggests that the firms founded by engineering and technology graduates have the potential to contribute economically through job creation. If HBCU engineering programs are able to influence black technology entrepreneurship rates, the resulting effects may lead to economic improvements in the form of reduced unemployment and job availability, as well as the creation of much needed wealth in the black community (Pinkett & Robinson, 2011) through business ownership.

Limitations and Future Research

Before offering directions for future research, we want to mention several limitations of this paper. First, of the 102 HBCUs, we only studied a small subset of these schools in our review. The requirement that schools maintain ABET and AACSB accreditation led to the exclusion of most of the HBCUs. While our review covered 10 institutions, we identified a total of 22 ABET-accredited engineering programs and 23 AACSB-accredited business programs. Many HBCUs that do not offer a bachelor's degree in engineering do offer some type of technology-related courses. We chose to focus on the 10 schools because they represent premier programs that meet strong accreditation requirements in both engineering and business (i.e., entrepreneurship). Future research exploring the technology and business programs at HBCUs may find unique programs and best practices that could be emulated at schools that do not have accredited engineering and/or business schools, but who do wish to promote entrepreneurship.

The scope of our analysis was limited to the examination of HBCU undergraduate degree programs in engineering and business. Future studies may consider alternate undergraduate degree programs related to the STEM fields, such as computer science or industrial technology, given that entrepreneurship education in these areas may also influence overall black entrepreneurship rates within advanced technology fields. Consideration may also be given to graduate level programs in engineering and business at HBCUs. According to Winter (2002), schools offering the master of business administration (MBA) degree have also recognized the need to infuse engineering/technology with business. Data on the education of technology firm founders shows a large percentage of founders possessing graduate degrees in business and engineering (CB Insights, 2010; Wadhwa *et al*., 2008). To assess the role of graduate education on technology entrepreneurship, future research should examine graduate degree programs in these fields to gauge their focus on entrepreneurship.

Additional studies on entrepreneurship education within engineering schools can look beyond HBCUs to consider other mission-specific schools. Hispanic-serving institutions (HSIs), similar to HBCUs, are focused on serving the educational needs Hispanic students. Given the elevated rates of unemployment in the Hispanic community, a similar study focused on HSIs may highlight opportunities to encourage entrepreneurship among this demographic group. As this demographic group is expected reach one-third of the U. S. population by 2050 (Greenhalgh & Lowry, 2011), findings from a study on entrepreneurship education at HSIs may have wide-reaching implications.

CONCLUSION

The review of HBCU engineering education revealed HBCUs to be lacking in their support of educating the next generation of technology entrepreneurs. While the results do not depart from current efforts at most engineering schools, the argument can be made that HBCUs should provide opportunities for engineering students to engage in learning about entrepreneurship mainly as a way to support their relevance and encourage black technology entrepreneurship. With HBCU business schools largely engaged in providing entrepreneurship education, opportunities for collaboration across business and engineering programs currently exist to ensure that engineering students gain much-needed exposure to entrepreneurship.

There is a link between technology venture creation and unemployment reduction, and with the expected growth of the technology sector, it is likely that technology-related businesses will continue to attract a significant portion of investor funding. By encouraging blacks to engage in technology entrepreneurship, they may be able to take advantage of a fast growing field and attain funding for potential business ventures. If they are successful in creating a sustainable business or enterprise, they can then seek to bring other blacks into their firms, thereby providing a source of additional job creation that the black community can utilize to decrease elevated unemployment rates.

As the relevance of HBCUs continues to be questioned, leading the reversal of current trends in black unemployment and technology entrepreneurship is an area in which these institutions can show their value. Achieving these goals would result in HBCUs serving as a national model for addressing similar issues in other underrepresented groups, through minority-serving higher education institutions.

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MARKET DEMAND ANALYSIS ON BUSINESS SUPPORT TRAINING FOR THE MSME SECTOR IN JAMAICA

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ABSTRACT

Business support training is crucial for bolstering performance of Jamaican MSMEs; and consequently, a demand analysis of training needs is required for a targeted determination of training demanded by this market. Moreover, the training/firm-size literature has presented a few studies that have diagnosed training needs of this group, albeit to a very limited extent. Nowhere to be found however, within the related literature, is a demand analysis of training needs of this sector or a comparative assessment of training demanded by firm-size. This study has addressed this gap; and argues that training demanded by this very important sector must be met if Jamaican MSMEs are to deliver on the herculean tasks of economic growth, employment generation and poverty alleviation. Utilizing telephone survey and final sample of 200 Jamaican firms, the study found that customer service, managing your business for success and marketing your business were the top three courses demanded by the MSME market. More detailed findings revealed that, in all instances, where demand for training was delineated by firm-size, micro firms had less demand for training courses than small and medium. Implications for training providers, limitations and opportunities for further research are also discussed.

INTRODUCTION

The Global Entrepreneurship Monitor Jamaica 2010 Report noted that in 2008, 26% of Jamaican with potential to do business indicated that fear of failure would prevent them from starting any such venture. This proportion declined to 24% in 2009 but again increased to 33% in 2010. It is believed that, business support training is necessary for bolstering entrepreneurial confidence and for developing the human capital required for success of firms (Waddoups, 2011). Despite recognizing the importance of business support training to firm's success, many MSME owner/managers do not access training courses largely because of constraints with their time, financial constraints, along with perceived lack of relevance of these courses to the needs of the business (de Vries & Dana, 2009).

Research has shown that business failures among younger firm are associated with deficiencies in managerial knowledge and financial management capabilities; while in older firms, these failures are attributed to inability to adapt to changes in the business environment (Thornhill & Amit, 2003). Moreover, "firms are at greater risk of failure when they are young and small" (p. 497).

The relationship between a skilled workforce, increased competitiveness and sustainable growth is fully established in the small business literature (Lee & McGuiggan, 2008). However, much of the previous research in this area has focused on reasons for failure among MSMEs (Edmister, 1972; Gaskill, et. al 1993; Thornhill & Amit, 2003); and so, little is known about the training behavior of very small firms (Waddoups, 2011) or the business support training that is demanded by the MSME sector for mitigating failure. Waddoups asserts that " training behavior differs in very small firms compared to their larger counterparts", and consequently, "research using [incomplete data] will fail to fully capture the economy's training experience, and thus, will not observe a potential source of training deficit that may exist" (p.391).

The purpose of this study is twofold: first, to determine market demand for training by the Jamaican MSMEs; and second, to ascertain differences, if any, between firm-size and training demanded. In carrying out this undertaken, a focus group was initially conducted for a preliminary identification of training courses that are needed by the sector (Table 1).

Table 1: MSME Business Training Needs generated through Focus Group Discussions

Management of Financial Records	Putting your Business Online
Costing and Pricing	Managing your Business for Success
Getting a Boost in your Business	Financial Statement Analysis
Taxation	Product Development
Marketing your Business	Cash Flow Management
Growing your Business	Customer Service

This was followed by a telephone survey where data was collected for computing market demand along with differences between micro, small and medium firms on training demanded. Notably, training needs in this study were captured through focus group backed by survey question on 'intention to do course'. However, in determining training demanded

by the market, the analysis was taken a step further where training needs identified were matched against the dollar value that the market is 'willing to pay' for the courses. See section on Methodology for more details on determining market demand.

CAPABILITIES REQUIRED BY THE MSME SECTOR

Small business failure is largely attributed to two main factors; namely, managerial and planning functions and working capital management (Gaskill, et. al 1993). Further, "inadequate knowledge of pricing strategy" and "ineffective advertising/promotional strategy" were found to be the most dominant attribute of the first factor; while "inadequate financial accounting record keeping" was seen as central to the second (p.25). In addition, analysing and forecasting cash flows, doing business online and pricing of goods and services were recognised among the top competencies required by owner/managers of small and medium entities (Lee & McGuiggan, 2008). Similarly, de Vries (2004) reported cash-flow management, compliance, managerial inexperience and limited marketing capability as the chief bugbear of the MSME. On other areas of capabilities required within the sector, Allee and Yohn (2009) highlighted the importance of financial statement analysis to small firms and concluded that audited financial statements benefited firms through greater access to credit and effectively done accrual based statements are associated with lower cost of credit.

Following on their 2008 findings, Lee and McGuiggan (2009) studied 32 indicators of owner-managers' perceptions on types of skills and knowledge needed by small businesses personnel; and found that marketing related competencies namely, marketing research, store promotions, advertising, knowledge on positioning of firm, loyalty program management and cross selling skills were identified among the top 10 skill-sets required by these entities. Based on the foregoing literature along with preliminary identification of business training needs uncovered through focus group, this study will first address:

RQ1: What are the training courses demanded by the MSME sector?

FIRM SIZE AND DIFFERENCES IN TRAINING BEHAVIOR

An IDB (2006) study on MSMEs in Jamaica found a positive relationship between size of enterprise and education level of owner-managers; thus indicating that larger firm are outfitted with better trained managers. Similarly, a number of studies have found a positive correlation between the likelihood of training and firm-size (Green et al. 1999; Lynch & Black, 1998; Waddoups, 2011); and it has been shown that much less training occurs in firms with fewer than 10 employees (Waddoups, 2011). Further, within industries, the size of business is influential in demand for training and consequently no single approach to training is ideal with industries of differing requirements and needs (Gray & Lawless, 2000). Based on the firm-size/training dynamics explored in the literature therefore, this study will seek to address the follow-up question:

RQ2: Is training demanded different among micro, small and medium firms?

METHODOLOGY

The methodology for determining demand for business training among MSMEs[1] in Jamaica is discussed in three stages: First, a focus group was conducted for identifying training needs among participants. The decision to use focus groups for the preliminary identification of training needs was based on the notion that focus groups would provide a better alternative than the MSME literature since Jamaica's recent classification of MSMEs is country specific (MSME and Entrepreneurship Policy,13th draft, 2012); and the MSME literature tends to be confounding, as, in the main, it treats with MSMEs in the collective, when there are so many different definitions of micro, small and medium entities used by multilateral agencies and departments both within and across countries. See Smith and Deslandes (in press). Further, the sample for the focus group was drawn from the 2013 Jamaica RedBook[2]telephone directory with 12 individuals participating in the sessions; four informants from each of the three groups. These individuals were either business owners, managers of MSMEs or representatives who were in leadership positions within these entities. Business training needs arising from the manuscript of the focus group were analysed for convergence on training required; and 12 courses considered relevant across all three entity types were identified and used as items for a survey instrument that was developed in the second phase of this undertaking. This survey instrument is constituted by demographics, industry type (agriculture, manufacturing, construction, etc.), entity type (micro, small and medium) and other general attributes related to the entity and respondent.

Second, a telephone mode of administration was used for conducting the survey. This method of triangulation was chosen for following up on the focus group as survey allows for generalizing and more wide-scale assessment on focus group findings. The 2013 Jamaica Online Yellow Pages was adopted as the sample frame. This frame constitutes the wide cross-section of businesses across all 14 parishes in Jamaica; and a representative sample of over 600 firms, stratified by industry type and parish was drawn from the frame. Further, the entity type designated as micro, small and medium was determined during the administration of the survey based on a classification question on number of employees within the entity; and a brief scripted description of each course was read to respondents so as to allow for informed choices. Notably, the scripted description is aimed at addressing the gap in the literature where most of the studies in this area "do not observe the substance of training courses" (Waddoups, 2011, p. 391). The final sample consisted of 200 firms that were distributed as follows: micro (39%), small (44%) and medium (18%). These firms were also spread across industry types with real estate & professional services (25%), wholesale & retail trade (16%), transportation & communication (16%) and manufacturing (15%). The large majority of respondents surveyed (78%) were either owners or managers, with the remaining (22%) being supervisors or individuals who were in senior positions with the company. These respondents were evenly divided across gender: male (50%) and female (50%); with a total of 80% reporting tertiary education as the last level of attainment: 17%

[1] In this study the MSME is defined in accordance with the Jamaican MSME & Entrepreneurship Draft Policy of 2012; where micro firms consist of ≤ 5 employees, small: 6-20 and medium: 21-50.

[2]The Red Book utilized comprised three of the 14 parishes in Jamaica (Kingston, St. Andrew and St. Catherine); and the sample selected was representative although not including MSMEs from all parishes.

with secondary/high school education; and less than 4% with primary education as the final level.

Third, the analysis of the survey data was undertaken with SPSS version 16. In order to determine market demand for business training, descriptive statistics were generated for distributing the likelihood of taking these courses captured by 5-point Likert scales; and labelled from 'definitely do it' thru 'definitely not do it'. The maximum 5-points on the scale (definitely do it) was treated as a proxy for *indicative demand* and was juxtaposed by amount willing to pay, per person, per day, for deriving market demand. In addition, parametric testing via One-Way Anova was used to determine significant difference between means in relation to the three categories of firm types. This was followed up with the Post Hoc test using Scheffe for determining the magnitude of the differences in market demand for business training based on firm size.

RESULTS

The results from analysis of the survey data indicate that customer service (46.7%), managing your business for success (27.5%) and marketing your business (26.9%) are the top three courses demanded by the MSME sector. Each of these courses is demanded at approximately US$50 per person, per day, for a 3-day course. In contrast, getting a boost in your business (8.6%), costing and pricing (10.3%) and financial statement analysis (10.4%) are least demanded. Notably, the lowest demanded course; getting a boost in your business is demanded at approximately US$10 per person, per day for a 3-day course; while the other lower demanded courses, namely, costing and pricing and financial statement analysis are each demanded at approximately US$50 per person, per day, for a 3-day course (Table 2).

Table 2: Market Demand for Business Training Courses

Courses	Definitely do it (%)	Probably do it (%)	Uncertain to do it (%)	Probably not do it (%)	Definitely not do it (%)	Quantity Demand (# of firms)[3]	Pay/Person/Day mean; mode; median (3-day course) [J$[4]]
Management of Financial Records	14.1	27.6	7.6	16.5	34.1	7,050	3083;1500;2500
Costing and Pricing	10.3	19.6	9.2	20.1	40.8	5,150	4350;5000;5000
Getting a Boost in your Business	8.6	12.4	3.2	21.6	54.1	4,300	1000;1000;1000
Taxation	15.7	25.8	3.9	20.8	33.7	7,850	3974;5000;4000
Marketing your Business	26.9	32.1	5.1	12.8	23.1	13,450	4198;5000;4500
Growing your Business	25.5	35.0	6.4	14.0	19.1	12,750	4229;5000;4000
Putting your Business Online	22.6	17.3	7.7	14.3	38.1	11,300	4251;5000;3500
Managing your Business for Success	27.5	24.6	5.4	18.0	24.6	13,750	4496;5000;5000
Financial Statement Analysis	10.4	23.7	3.5	18.5	43.9	5,200	4933;5000;5000
Product Development	13.3	20.8	2.9	17.9	45.1	6,650	4073;5000;4000
Cash Flow Management	20.6	21.2	4.7	15.3	38.2	10,300	4149;5000;3300
Customer Service	46.7	16.4	2.6	13.2	21.1	23,350	4904;5000;5000

Courses in costing and pricing, getting a boost in your business, putting your business online, managing your business for success and customer service were less demanded by micro firms than their small and medium counterparts. However, there were no significant differences between firm types on demand for courses such as management of financial records, taxation, marketing your business, product development and cash flow management. Similarly, there was no evidence to suggest that market demand for business training courses was any different between medium and small firms (Table 3).

[3]The popular estimate is that there are approximately 50,000 MSMEs in Jamaica
[4]Exchange Rate: US$1 to J$100

Table 3: Market Demand for Training by Firm Type

Courses	Min	Max	ANOVA Results Micro (MI), Small (SM), Medium (ME)
Management of Financial Records	1	5	F (2,167) =3.191; p =. 044; eta squared=.04; n/s between means on Post Hoc
Costing and Pricing	1	5	F (2,181) =4.09; p =. 018; eta squared= .04; MI:[M=2.01, SD=1.316]; SM:[M=2.61, SD=1.455]; ME:[M=2.67, SD=1.539] MI < SM*; (*p<.05)
Getting a Boost in your Business	1	5	F (2,182) =7.119; p =. 001; eta squared= .07; MI:[M=1.60, SD=1.083]; SM:[M=2.11, SD=1.331]; ME:[M=2.61, SD=1.713] MI <ME*; (*p<.05)
Taxation	1	5	n/s
Marketing your Business	1	5	n/s
Growing your Business	1	5	n/s
Putting your Business Online	1	5	F (2,165) =4.182; p =. 017; eta squared= .05; MI:[M=2.28, SD=1.565]; SM:[M=2.97, SD=1.6181]; ME:[M=3.10, SD=1.676] MI <SM*; (*p<.05)
Managing your Business for Success	1	5	F (2,164) =3.550; p =. 031; eta squared= .04; MI:[M=2.78, SD=1.608]; SM:[M=3.49, SD=1.432]; ME:[M=3.07, SD=1.741] MI < SM*; (*p<.05)
Financial Statement Analysis	1	5	F (2,170) =3.781; p =. 025; eta squared=.04; n/s between means on Post Hoc
Product Development	1	5	n/s
Cash Flow Management	1	5	n/s
Customer Service	1	5	F (2,149) =7.831; p =. 001; eta squared= .10; MI:[M=3.00, SD=1.780]; SM:[M=3.82, SD=1.479]; ME:[M=4.31, SD=1.225] MI < SM* & MI < ME*; (*p<.05)

DISCUSSION

A thorough search of the training/firm-size literature has uncovered very few studies that have diagnose training needs of the MSME sector; and those that have done so, have focused largely on small and medium entities. Nowhere to be found, prior to this undertaking, has there been a comprehensive and empirical assessment of training demanded by a representative sample of MSMEs; or has there been any such comparison on training demanded by firm-size. Indeed, this is required as with the important role that the MSMEs continue to play, a targeted approach to training is necessary for bolstering performance of this sector. Consequently, this study has addressed this gap; and found the top three courses

demanded by the MSME market in Jamaica were customer service, managing your business for success and marketing your business. In contrast, getting a boost in your business, costing and pricing and financial statement analysis were least demanded among 12 courses identified. Of note is that courses in customer service were demanded by almost one half of the MSME firms while marketing and managing your business for success were each demanded equally by approximately 27% of the market.

This inordinately high level of customer service training demanded by Jamaican firms is indicative of a growing trend of dissatisfied customers where smaller firms, in particular, do not spend on customer service due to dwindling cash flows. Owner/managers within these entities however, while may not be able to afford the reengineering of firms for improving customer service are more than willing to pay for courses in this area as need for customer service competence within the firms is becoming more tangible with the fiercely competitive marketplace.

Consistent with expectation (de Vries, 2004; Gaskill, et. al 1993; Lee & McGuiggan, 2009) is the very high demand among MSMEs in Jamaica for training in marketing. This can be explained by difficulties expressed by owner/managers to maintain sales in a climate characterized by shrinking disposable income; and so there is great need for marketing competencies which can somewhat be facilitated through these courses; even though this may not be enough. However, owner/managers have indicated that there are no funds available to carry-out the much needed advertising and promotion campaigns; and so business support training in marketing is seen as a consolation.

Managing your business for success which was also found to be highly demanded, is a course described to participants as having a management consultative component, where each firm would be individually diagnosed on its management problems; and solutions prescribed for providing that proverbial *shot in the arm* for improving business. The high magnitude of this demand is believed to be due to the consultation that would be provided to these firms for the price of a training course; as consultancy charges are prohibitive within the sector; and so this would be interpreted as value for money. Further, although the Government provides highly subsidized management and business support for MSMEs through its agencies, the records have shown that larger-type MSMEs do not access these facilities; perhaps because of the stigma associated where these agencies are for start-ups and do not have the capabilities required for handling the problems of larger firms. In substantiating this point on lack of access of Government agencies by larger MSMEs, the findings of this study showed that small firms (6-20 employees) would significantly demand courses in managing your business for success much more than would micro firms.

Other courses, such as costing and pricing and financial statement analysis generated low levels of demand, contrary to expectation. See Lee and McGuiggan (2008) and Allee and Yohn (2009). Reasons for these findings are clearly not obvious. However, it is believed that these courses may be viewed as a bit academic by the targeted participants, many of whom would have already taken them at university (80% respondents reported tertiary education as the last level of attainment); and so there was nothing new or thought provoking about these courses; as costing and pricing was described to include topics such as costing methods, breakeven analysis and pricing of services; while financial statement analysis would provide coverage on the financial tools and methods for evaluating firm's performance.

The findings revealed that for some courses (such as customer service, managing your business for success and putting your business online) demand was delineated by firm-size; while for others (such as marketing your business, taxation and cash flow management) there were no differences between the size of firm and the number of courses demanded. Further, it must be highlighted that in all instances where there were differences between the size of firm and the number of course demanded, micro firms recorded less demand than the other two firm types. The demand/firm-size dynamics on these latter findings would require qualitative assessment for in-depth understanding and explanation. However, the finding related to the lowest demand recorded by micro firms compared with its counterparts, across all courses, is very likely an issue of lack of funding which has become a bugbear, particularly among the micro business firm.

Although the study design is robust and constitutes a representative sample of MSMEs that spans the gamut of Jamaica, hence providing generalizable findings, the modus operandi of telephone survey is limiting, not only with over- and under reporting that characterises surveys but also in terms of the scripted and succinct descriptions of courses that were articulated via the survey, leaving questions as to whether more in-depth descriptions would lead to different findings.

CONCLUSION

The training/ firm-size literature is void in its treatment of business support training required by the MSME sector; and while there may be few studies that have attempted to identify training needs of this sector, the literature search has revealed that there are little or no scholarly work, before this undertaking, that has determined the support training demanded by this group. Indeed, the identification of training needs which has previously been done, albeit to a limited extent, cannot be equated with a study of this magnitude where a fulsome analysis of training demanded was undertaken from a sample, suitably representative of the MSME market. Further, previous studies on training needs assessment in this area, seem to lack rigor and could arguably be viewed as a *wish list*, while demand derived (i.e. taking the analysis a step further), as in the case of this project, tantamount to a scientific determination of 'intention to take courses' augmented by 'willingness to pay' for the intended offering.

The top three courses demanded namely, customer service, marketing your business and managing your business for success provide a *quick-win* for MSME training providers. These providers should respond to this demand and develop these and related courses at present value US$50 per person per course for 3-day courses. In addition, micro firms, despite registering very low demand for courses, should not be ignored owing to the important role that they continue to play in Jamaica's development. In this case, the Government should provide these offerings through its agencies and subsidizing courses for increasing *take-up*. Further research, particularly within developing economies, both similar and different to Jamaica, should replicate this project, utilizing the business support courses identified in this study as a starting point towards generalizing and providing wider applicability of the study's findings.

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ENABLING ENTREPRENEURIAL MINDS: USING APPRECIATIVE INQUIRY AS A PEDAGOGICAL TOOL FOR UNCOVERING SELF- AWARENESS AND FOR GENERATING CONSTRUCTIVIST LEARNING

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ABSTRACT

Constructivist learning is one of the stepping stones to developing an entrepreneurial mind. In this paper, we explore the use of appreciative inquiry as a pedagogical tool for constructive learning and suggest that an individual's form and identity construction is, at least partially, dependent and connected to the larger social structure. We provide directions on creating constructivist learning platform to enable students' schemata to re-configure and be redefined, enabling them to develop an entrepreneurial mindset. Further, this paper calls for shifts in policies in our schools, classroom environments, assessment tools, and course contents to reflect the social nature of entrepreneurship and innovation and to create the imperative skills and broad competencies such as the ability to solve ill-defined problems, to be creative, and to be adaptable (Hilton, 2008) in our workforce.

Keywords: appreciative inquiry, entrepreneurial mind set, pedagogical shifts, constructivist learning.

INTRODUCTION

The focus on entrepreneurship (small business and corporate) in university curricula is gaining traction. The need for such curricula is compelling since 'labor market requires graduates with enhance skills who can think on their feet and be innovative in a global economic environment' (UK Quality Code for Higher Education, 2012: 2). Increasingly, universities are offering courses that stress entrepreneurial behavior and skills. The underlying assumption in offering such courses seems to lie in their ability to better equip students for entrepreneurship efforts. One of the core skill sets of a potential entrepreneur lies in his/her (entrepreneurial) mindset – entrepreneurship literature identifies skills such as creative problem solving, comfort with ambiguity and uncertainty, resilience, and calculated risk-taking for the success of an entrepreneur (Human, Clark & Baucus, 2005; Morris, Kuratko & Covin, 2008). Therefore, one of the objectives of entrepreneurship courses is to help students discover the skill sets they possess as well as their potential areas for improvement.

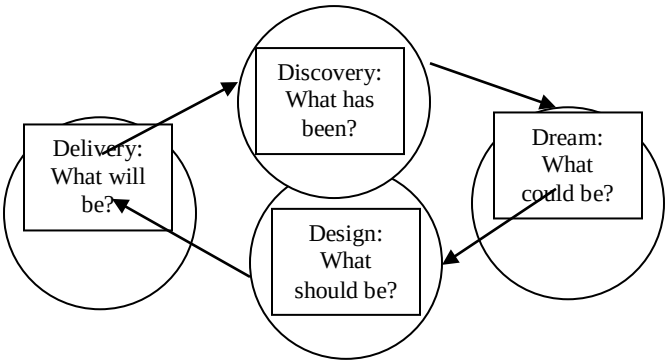
In this paper, we examine the process used in a core course for entrepreneurship students at a university in the Midwest United States. One section of this course is designed expressly to help students explore their entrepreneurial ability and mindsets. While self-discovery is important, what's equally important is for students to recognize the assumptions upon which their self-realizations rest. We further explore the source of students' assumptions about the

skills they possess and do not possess. While traditional pedagogy follows a technical-functional approach, what is required for the journey towards self-realization is a conversational, dialogical approach (Neville, 2008). This course, therefore, uses appreciative inquiry as a pedagogical tool as students embark upon their journey towards self-realization.

In this article, we outline the appreciative inquiry approach in general and then explain how this approach is applied in an entrepreneurship class for the undergraduate business students. Along the journey, students realize their selves and uncover the underlying assumptions for their self-realization. In this paper, we discuss how an individual's form and identity construction is, at least partially, dependent upon and connected to the larger social structure. On this basis, we discuss the challenges we face as faculty in managing the subtleties of enabling an entrepreneurial mindset and examine how current classroom practices for educating students for entrepreneurship may not be adequate.

APPRECIATIVE INQUIRY

The principles: Appreciative inquiry (AI) is a positive philosophy and methodology to change organizations whereby members of whole systems convene to inquire for change (Cooperrider & Srivastava, 1987). AI recognizes the power of the whole and builds on conversational learning that emerges out of the whole. It is a social constructionist approach based on the assumption that human systems move in the direction of their members' shared image and idea of the future (Cummings & Worley, 2008). It was developed to shift the traditional mindset about change from one of fixing what is broken (i.e., problem solving) to one of embracing strengths and developing greater capability for the system by building on a shared understanding of and appreciation for the positive attributes of the whole. Change, therefore, is based on intentional examination of what has worked best in the past and what could be grown from that past for the future. In this sense, AI suggests that human organizing and change is a relational process of inquiry that is grounded in affirmation and appreciation (Whitney & Trosten-Bloom, 2003). Advocates of this philosophy have used it to create change in diverse settings. For example, Vuuren & Crrous (2005) have used AI to create a shared meaning of ethics in organizations, and Finegold et al. (2002) have used this methodology to generate a systems change in a midwestern university. Typically, the process involves having participants work through the four phases: Discovery, Dream, Design and Delivery (Conklin, 2009).



(Adapted from Conklin, 2009)

Discovery (*What has been*?). In this phase, participants inquire into and discover the positive capacity of the group, organization or community. People are encouraged to use stories to describe their strengths, assets, peak experiences and successes to understand the unique conditions that made their moments of excellence possible. This process builds connections and develops a psychological comfort among the participants.

Dream (What could be?). Building on the moments of excellence of the participants, this phase encourages the participants to imagine what would happen if their moments of excellence were to become a norm. Participants dream for the ideal conditions and build hope and possibility of an ideal future.

Design (What should be?). In this phase, design principles are used to help the participants realize their dream. Participants are encouraged to stretch their imagination to move the system from where it currently is to where the participants want it to be.

Delivery (What will be?). At this phase, participants are encouraged to think of the various sub-systems that are needed to 'sustain the design from the dream that it discovered' (Cooperrider et al, 2003, pg. 182). Participants are encouraged to decide what they will commit themselves to do.

We now discuss how this process is used as the foundation for enabling students in a course to become creative and develop entrepreneurial mindsets.

COURSE DESIGN

Creativity is considered to be the soul of entrepreneurship (Morris, Kuratko & Covin, 2008) – it is vital for spotting trends and patterns that define an opportunity. The AI approach is applied in a course called 'Creativity & Innovation' for undergraduate students at a midwestern university. This course is the first core course for entrepreneurship majors or minors. Students majoring in other disciplines such as Management, Human Resources, and Communication Arts also take this course as an elective.

A primary objective in this course is to develop students' courage to create, and to risk making mistakes in the quest for ideas that lead to a true innovation of a product, service or process. The content of this course, therefore, has two components. First, the students in this course learn the process of how they can generate capitalist creativity – i.e. generating ideas that have a potential to reflect profitability and bottom-line practicality. This process includes problem finding, generating multiple creative solutions, assessing opportunities and implementing creative solutions.

Since research has suggested that various factors such as personal characteristics (personality, cognitive style) and contextual characteristics (job complexity, spatial configuration, etc.) have a potential to enhance and/or stifle creativity (Shalley, Zhou & Oldham, 2004), the second component of the course examines the attitudes and behaviors that the students will need to establish themselves as entrepreneurs or intrapreneurs. These attitudes and behaviors include a propensity to take risks, an ability to deal with ambiguity and exercise initiative. For example, individuals with high confidence and high tolerance for ambiguity are able to recognize divergent information and opinions and therefore score higher on a test of their creative potential (Oldham & Cummings, 1996). Upon completion of this course, the expectation is that students should (1) become familiar with the creative process, and (2) should be able to recognize their own innate creative ability and, therefore, entrepreneurial potential. For the purpose of this paper, we focus on the second component of the course, i.e., the mindset of an entrepreneur.

In order for students to determine their own mindsets, they use a diagnostic self assessment tool called the 'Do you have what it takes to be an entrepreneur' test (Human et al., 2005) since diagnostic self-assessment is a well established pedagogical tool for helping individuals examine their own selves and accept the need for change (Human, Kilbourne, Shriberg & Cunningham, 1999). Some of the questions in this tool include questions such as 'Do you have unbridled enthusiasm, for example, for your business idea?; Do you believe you control events in your life?; Do you take risks and enjoy the excitement associated with taking risks?; Can you view uncertainty and ambiguity in a neutral way, not letting it create fear or frustration?; Can you bounce back from setbacks or failures?; Do you like to experiment with new and different approaches to problems?

Students work on this self assessment tool prior to coming into the class. They are asked not only to fill up the dimensions in the tool, but also to reflect upon their experiences to provide substantiation to what they are saying. For example, if the students say that they rate themselves high in their risk taking ability, they are required to provide examples that substantiate their claim. On the day of the discussion, the students are required to bring in the completed self assessment tool.

The steps for classroom discussion and use of the self-assessment are:

1. The instructor sets a common context for the class, explaining to them why we are doing what we are doing.
2. The instructor further sets the context by creating a hospitable space for the students. Some studies in the creativity literature have examined the effect of adequate physical environment (overall density of the setting and noise levels) on individuals' creativity (Oldham, Cummings & Zhou, 1995). In addition to the physical space, psychological space (in terms of team-member relations) may also impact team member engagement and their creative outputs (Amabile et al, 1996). Therefore, the intent is to develop a hospitable space – a hospitable physical space and a hospitable psychological space - in the class. Using flipcharts, minimizing use of PowerPoint slides, and staggering the tables so students face each other rather than just facing the instructor (indicates egalitarian and promotes conversations) are some measures useful in creating a hospitable physical space. In an attempt to build a hospitable psychological space, the instructor also attempts to develop psychological safety (Edmondson, 1999) in the class, so students are comfortable speaking their minds without any fear and hesitation. Psychological safety is defined as a shared belief held by the group that the group is safe for interpersonal risk-taking. A climate of psychological safety is positively related to learning (Edmondson, 1999) and innovation initiatives (Baer & Frease, 2003). Therefore, in order to engage in constructive learning in the course, developing such a hospitable space is important.
3. The instructor encourages the students to respect ground rules that maintain the positive context. This ensures that the process proceeds in an affirming way. Since the answers depend upon the type of questions that we ask, as a starting point, the instructor encourages students to explore their peak/positive characteristics. Included as prompts for this processing are questions such as:
    i. What positive characteristics do you consider yourself to possess?
    ii. Can you provide support/substantiation to (i)?
    iii. Please recall the conditions that made these experiences possible. For example, if a student says that he/she is comfortable with ambiguity, the student is asked to share examples of why he/she thinks that he/she is comfortable with

ambiguity. Further, the student is asked to try to recall what made her/him comfortable dealing with ambiguity.

By the nature of inquiry, some characteristics may not necessarily become a part of the conversation. Therefore, students are also encouraged to explore the other questions that matter to them.

4. The instructor encourages the students to listen to everyone's perspectives, emphasizing that divergent perspectives are equally important as convergent ones and that an open mind and an appreciation of divergence are necessary to have fruitful discussion. The students are encouraged to listen to each other and to notice patterns of similarities and differences.

During class time, the role of instructor evolves from being an instructor to being a facilitator and a co-explorer in the class. This shift in role allows the instructor to assist students in exploring the content of their conversations, identifying where students resonate similar patterns and where students experience paradoxes. Using appreciative inquiry, students engage in an emergent dialogue to self explore themselves. Students use positive imagery to unleash their potential and the potential of others through affirmation.

In class, students work in groups of 4-5 members. An appropriate group size is essential for allowing the design principles to unfold. To establish the groups, at the beginning of the exercise, the instructor asks the students to pick and choose the people they would like to have on their first team. This tactic is deliberately employed to maximize their comfort level within their groups. They choose to be with people with whom the students associate and already have relationships. This process is useful to generate a comfort level and psychological safety for the students. The instructor reminds the students of the basic parameters that they need to keep in mind as they begin their journey.

Once the teams are in place, and the initial discussion of each person's test results has been completed, the class moves to specific application of the AI process.

THE PROCESS

Discovery (What has been?). In this step, students reflect on the past to recollect instances when they believed they showed entrepreneurial ability. They are asked to reflect upon those peak moments of greatness and ask them to map the characteristics they believe they possessed during those instances. In this step, the students' discussions are guided by instructions to do the following:

1. Share instances when you believe you demonstrated entrepreneurial ability.
2. What did you do to make that happen (your characteristics)?
3. What did others do to make that happen (context)?

As students discuss, they start generating a dense web of understanding – an understanding and an appreciation of their strengths, assets, peak experiences and the unique conditions that made their moments of excellence possible. These discussions last about 15 minutes, after which the groups share their findings with the entire class. Representative examples of common themes and characteristics of entrepreneurial mindset have included the following:

1. When I am passionate and enthusiastic;

2. When I possess an internal locus of control: a belief that that he/she controls the events in his/her success and/or failure;
3. When I possess a high need for achievement.
4. When there is no serious reprimand for failing – a non-threatening environment
5. When the situation/context has allowed for viewing uncertainty and ambiguity in a neutral way and for not letting it create fear or frustration
6. When the situation has allowed me to bounce back from failures – e.g., teacher has allowed me to experiment

Dreaming (What could be?). The next step in applying AI is to begin the process of dreaming. In this step, students use the budding notions about what characteristics make an entrepreneurial mindset that they generated in the previous step. As students share their stories, the focus of the process shifts to their dreaming a perfect desirable state for themselves. As they make this journey, the goal is to enable the students to build positive energy around their strengths as also to dream about the direction in which they feel comfortable moving.

In this step, the discussion with the students specifically coalesces around topics such as:

1. What characteristics of an entrepreneurial mindset are desirable?
2. What do they dream of when they think about an entrepreneurial mindset?

After spending about 15 minutes discussing those points, students are shifted to discuss the entrepreneurial skills that they believe are desirable for the success of entrepreneurship, innovation and creativity and the specific expectations for the class. Examples from their dream list include:

1. increased ability to take risks
2. build resilience
3. increased ability to tolerate ambiguity

Designing (What should be?). For this step in applying the AI process, the students reform into small groups and discuss what changes they envision so that characteristics such as risk-taking propensity, tolerance of ambiguity and resilience were to become a norm in the mindset of our students. At this stage, students are encouraged to imagine a perfect world without any constraints. Students suggest that their risk-taking propensity, tolerance towards ambiguity, and resilience are likely going to be promoted if classes are structured such that improvisation, more than perfection, is desired and encouraged.

Students are, in essence, asked what they think would have to happen for this class to help develop an entrepreneurial mindset for themselves?

Typical responses from the students about a perfect world of entrepreneurial training include:

1. There is no fear of failure – no embarrassment
2. Failures may be seen as ‘lessons learnt’
3. Encourage the speed with which learning happens and is put into practice
4. There is less structure provided to the questions – questions are ill-defined and carry with them some bit of ambiguity to mirror real world situations.
5. There is no such thing as only one right answer.
6. Improvisation, not perfection – there is no negative attribution of grades for not getting the ‘one perfect right answer’.

Delivery (What will be?). As noted in Conklin (2009) 'this step involves [moving] from the nominal list that reflects the grand desires of the class to something that reflects the will of the class' (pg. 11). In this phase, students are encouraged to discuss how their dream design can be sustained over the semester. In doing so, students inadvertently articulate the various sub-systems (of the complex inter-connected system) that they believe could potentially help realize their dream. The method of education, by far, appears the most important sub-system where students would like to see some changes. Students articulate that all along in their education journey, 'we have been trained to find one right answer', 'we have been told that there is just one right answer – therefore if you get it wrong, you are graded negatively', and 'deviance from the one right answer is discouraged'. It is natural, then, that 'we are unable to initiate' – therefore, 'don't ask us to create questions – if you give us one, we can provide you with right answers'.
At this step, students articulate that developing an entrepreneurial mindset is influenced by various factors at various stages of their life. The one common thread all along has been their 'education journey'. For our students to deliver on a truly entrepreneurial spirit and ability, the task for faculty members seems to be to provide students with a system where their entrepreneurial mindsets can be reared and harnessed. As academics, it requires us to reconsider a social structural shift towards building constructivist thinking, not just in one course but all along our education curriculum.

DISCUSSION

After using self-discovery as a conversational, dialogical approach in multiple semesters with a varied set of students, anecdotal evidence points to the fact that an individual's thoughts, behaviors and actions are, at least partially, dependent upon and connected to the larger social structure. The way individuals think – their schemata - have an effect on their behaviors and actions (Weick, 1995). While individually held, schemata are powerfully influenced and shaped by the surroundings of the individuals, thus reflecting the duality of structuration of Giddens (1979, 1984). Therefore, if our structures continue to emphasize the fear of failure, negative attributions of grade for any deviance from the 'one perfect right answer' approach, then we are likely to see regurgitation and replication of risk-averse schemata and behavior. Over time, such risk-averse schemata is likely to become auto-referential and could become the main obstacle to any change (Leonard-Barton, 1992). If we believe that 'people achieve their knowing through culturally located systems' (Blackler, 1995, p.1021), then we need to identify the changes that are occurring within such systems, and the processes through which new knowledge may be generated.

Academic as well as practitioner discourse suggests that we have shifted from an industrial to a knowledge economy that is based on the creation of knowledge and innovation (Sawyer, 2006). The social nature of an entrepreneurial mindset in today's economy is the need of the day. But question arises whether structured, overly directed education is helping create an entrepreneurial and an innovative mindset in our future generations. As educators, the question for us is to examine how we could identify systems that could help break these vicious cycles and enable our schemata to be re-configured and redefined for the development of an entrepreneurial mindset.

The evidence from the classes discussed here demonstrates the need for us to advance from viewing students as passive receptors of knowledge to considering them as co-creators of knowledge. This paradigm shift would require a shift in the mindset of educators in the way we

build the content for our classes, our method for instruction, and the context we create for our students. While creative collaboration in the classroom aligns with the social nature of innovation in today's economy, we need to address the question whether our schools, our education system, our curricula and method of instruction truly reflect the disciplined improvisation approach (Sawyer, 2006)? Applying the AI process seems to achieve that end.

Specifically, evidence from this class points us to two pedagogical pillars for entrepreneurship education: critical thinking and experiential learning. Considering that analysis, skepticism and judgment are fundamental to an entrepreneurial mindset, entrepreneurship education requires for us to embrace critical thinking much more than, perhaps, any other academic discipline. Therefore, design of entrepreneurship requires for us to build exercises to enhance levels of critical thinking as students progress through their courses in entrepreneurship education, thereby steering students from being passive receptors to active co-creators.

The second pillar relates to infusing experiential learning in entrepreneurship education. As students engage with their own social context in an experiential manner (e.g. guest speakers, field visits, live case studies, consulting assignments, etc.), a process of self-discovery relative to the social structure around them, will shift students from being merely passive receptors.

This paper suggests some important implications for entrepreneurship education, for the design of course content, instructional delivery and the student-context relationship. We now present suggestions based upon experiences from the application of AI in a core entrepreneurship class.

Course content: Deliberate open-ended structure should be built into the course. Initially, students will feel uncomfortable building their own interpretations and will have trouble jump starting and initiating on their journey to constructivist learning. The discomfort is natural – students will need to push their mental models to adjust from the rigid scripted curriculum to one that is evolutionary and constructivist. Naturally, such course content thrives on not referring to the 'one right answer'- students are likely to arrive at different destinations depending upon their willingness to explore, tolerate and consider new and unfamiliar experiences. This has the potential to raise their 'openness to experience' (McCrae, 1987) trait which is a desirable trait for entrepreneurs.

Instructional delivery: Designing the course content as described above has significant implications on instructional delivery. One of the most important implications is that, since the course is likely to evolve differently in different classes, the instructor is likely to feel overworked and stressed managing such unpredictability. Further, the instructor's ability to relinquish control to serve as a facilitator encouraging dialogical inquiry rather than as an instructor conducting a monologue is another significant change in the instructional delivery. As we train future faculty members in PhD programs for academic posts, our pedagogies should, therefore, start to include facilitation and mediation techniques as well as conventional pedagogical techniques.

Designing the student-context relationship: The primary exigency in designing the student-context relationship is to eliminate the fear of students have about knowing or getting the "right answer." Creating psychological safety in the class is instrumental. Demonstrating tolerance of failure is also critical – tolerating failure in terms of trial-and-error in a productive manner is necessary to communicate and "live by" in the class. The implication for the instructor is to (1) clearly communicate expectations, (2) closely monitor students' diligence on the tasks, and (3) focus on the constructive learning from failures by the students. In that sense, the intent

is for the instructors to emulate such practices at companies like 3M, Nokia (where 'failure' is celebrated) and IDEO (where the motto is 'to fail often to succeed sooner').

While our focus in the discussion section has been on the structure of classes in the universities, we would also point out a caveat – such attempts are likely to have the most impact if all our schools, instructors, classroom environment, assessment tools, textbooks and curricula are re-designed to emulate and reflect the social nature of innovation. However, it will still not be enough to stop here. The work environment that our students graduate into needs to enable the perpetuation and encouragement of the entrepreneurial mindset of individuals. In that respect, we are in a complex web of interaction and system. Using a systems theory approach, all these various parts of the broader social system have an influence to generate and maintain a system of continued entrepreneurial activity. Otherwise, the entrepreneurial mindset nurtured in academia will be redeveloped into the "follow orders" mindset we are trying to overcome!

Early evidence points to the fact that the most imperative skills for our workforce are broad competencies that include the ability to solve ill-defined problems, to be creative, to be adaptable and to work in teams (Hilton, 2008). The National Research Foundation promotes the discussions about the demands for future skills. This paper has argued for the social structural shift towards constructivist learning away from rote memorization and towards dialogical inquiry away from passive reception of education in an attempt to build these desirable future skills.

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ON THE VARIABILITY AND RISK OF EVALUATING THE COMMERCIAL POTENTIAL OF TECHNOLOGIES: AN ENTREPRENEURSHIP COURSE EVALUATING REAL INVENTIONS FOR COMMERCIAL POTENTIAL

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ABSTRACT

This paper presents the results of a course offered at a Midwestern university. The course involved having students evaluate the commercial potential of inventions disclosed to the university. The aim of the course was to identify and select the most promising inventions for inclusion in an internship designed to create business plans and ultimately commercialize the technologies for profit. The results show the inherent risk involved in using a gated approach to evaluating and selecting technologies for commercialization. Consequences technology commercialization programs are discussed.

INTRODUCTION

With millions of dollars of research undertaken each year, many colleges and universities have researchers who develop innovative new products with commercial potential. Over time, many universities have implemented technology commercialization programs (also often referred to as technology transfer offices) designed to convert these inventions into money-making ventures that generate funds for the university and the researcher who developed them. The Association of University Technology Managers (AUTM) reports that between 1996 and 2007, university patent licensing had an impact of $187 billion dollars on the gross domestic product of the U.S., and 279,000 new jobs (AUTM, 2010). Over the past thirty years, university technology transfer programs have also led to the creation of more than 6,000 new companies (AUTM, 2010).

One of the key problems facing technology commercialization programs is how to evaluate the commercial potential of an invention or technology disclosure. With limited resources and often far more technologies disclosed by inventors that for which there are resources to commercialize, university technology transfer offices must find a way to evaluate the commercial potential of a given invention so that scarce resources can be efficiently allocated.

This paper looks at the process of evaluating technologies at a Midwestern university in a technology commercialization program. The central purpose of this paper is to examine the

effectiveness of two different techniques used to ensure accurate measurement of technologies: the use of multiple raters and the use of multiple ratings. The remainder of the paper is divided into four sections. In the Theory and Hypotheses section, we describe the evaluation process and develop two hypotheses that we used to guide us in the development of the program. In the Data and Methods section, we describe the data collected and the methods used to evaluate the technologies and test our hypotheses. The results of this hypothesis tests are present in the Results section, and in the Discussion section, we discuss the implications of our findings for the evaluation of the commercial potential of technologies, and we discuss the benefits obtained by student and inventor participation in the program.

THEORY AND HYPOTHESES

Technologies as Opportunities

A widely accepted theory of entrepreneurship today describes entrepreneurship as the nexus between an individual and an opportunity (Shane and Venkataraman, 2000; Shane, 2003). Although the process of starting and running a business is fairly well explored at this point, far less is known about the processes leading up to the formation of a new firm. One of those required processes is for an entrepreneur to determine which opportunity to exploit through the formation of a new firm, a phenomenon referred to as opportunity recognition and exploitation (Ardichvili, et al, 2003; Choi & Shepherd, 2004). Potential entrepreneurs often consider many different opportunities before choosing one and moving ahead with forming a new firm. As a would-be entrepreneur, an important consideration is how to evaluate and select those opportunities that have the highest chances of success (Human et al, 2004). Institutions such as universities and other organizations also face these same choices.

In the case of university technology transfer offices (henceforth, TTOs), these opportunities present themselves in the form of technology disclosures. A technology disclosure contains details about the technology, including specifications, perhaps a prototype, and associated literature, such as scientific papers outlining the creation and use of the product. Many technology disclosures have little or no commercial potential. For technologies with commercial potential, these present an economic opportunity for the university. The two most common methods of exploiting these opportunities are licensing and the establishment of a new firm. In the former case, the technology is licensed to an existing firm, which then works to exploit the opportunity presented by the technology (O'Connor & Rice, 2001).

Most commonly, technologies with commercial potential are licensed by TTOs to outside companies. The Association of University Technology Managers tracks statistics on the commercialization of technologies by universities and reported that in 2009, 596 companies were formed around university-developed technologies, but there were 5,328 licensing deals (AUTM, 2009), which means that licensing is roughly nine times more commonly undertaken as a means of commercializing technologies.

Although universities can reap economic and other benefits from successfully commercializing a technology, not all technology disclosures are created equal. Some

technologies may have no commercial potential at all, while other technologies may need further development before they can be commercialized. For example, in a study of 62 university TTOs by Jensen and Thursby (2001), only 31% of technology disclosures were licensed. When presented with a technology disclosure, a TTO must be able to evaluate its commercial potential in order to determine whether or not to commit further resources to commercialize the technology. Commercializing a technology can be quite expensive, including the associated costs of prototyping, marketing, and obtaining patents and trademarks. Being able to effectively evaluate technologies can help assure the effective use of limited university resources. At the same time, when evaluating technologies, TTOs do not want to inadvertently eliminate technologies that may have true commercial potential. In other words, we want to reduce measurement error so that we maximize the number of true positives, while at the same time minimizing the number of false negatives when deciding which technologies should be pushed forward for commercialization.

Multiple Ratings to Reduce Errors

Two techniques often employed to reduce measurement errors are: multiple raters and repeated measures. Using multiple raters is actually a specific form of repeated measures where a given construct is measured by more than one person (Stevens, 1996). By having multiple raters evaluate a given construct, it is possible to reduce measurement error by combining the results of all raters and obtaining a more reliable measure than can be achieved with only a single rater (Stevens, 1996; Barcikowski & Robey, 1984), as well as increasing the statistical power of the test in question (Minke, 1997). This multiple rater technique is widely used in human resources as a means of assuring fair and accurate evaluations of employees, and is a key feature 360-degree feedback (London & Beatty, 1993; Nowack, 2009). In the case of evaluating the commercial potential of a given technology, we may be able to avoid false positives and false negatives by having more than one person evaluate the technology.

In the case of multiple people rating the same construct over time, learning and familiarity with subject matter should lead to more agreement over time as the raters gain experience with their task (Murphy & Wright, 1984) and learn how to make finer distinctions between different categories (Rosch et al, 1976; Johnson et al, 1981). This should be particularly true when the raters are able to share their ratings with each other. A study of group members' reactions to differing opinions found that individuals with outlying opinions tended to be denigrated by other members, and individuals who advocated for consensus tended to be viewed positively (Kruglanski & Webster, 1991). In the case of multiple raters evaluating the same technology multiple times, we expect these various forces to combine such that the variability of ratings to decline over time, leading to our first hypothesis:

H1: Interrater agreement of technology evaluations will increase from Round 1 to Round 2.

The literature of group decision making has had mixed results as it relates to determining the overall impact of information sharing in the case of teams and information sharing (Gigone & Hastie, 1993). Despite the studies outlined in the preceding section, there are few empirical

studies that show empirical improvement in the overall quality of the decision made (Gigone & Hastie, 1993). One apparent cause for this lack of improvement in decision making is that groups tend to pool shared information and not to share unique information that might lead to a superior decision (Stasser & Titus, 1985; Stasser & Titus, 1987). In the process of sharing ratings, raters are able to compare their judgments against those of other judges, because the ratings represent pooled information. However, the sharing of idiosyncratic information about individual technologies that may improve the accuracy of a given technology is less likely because this is not pooled information. Without the sharing of this idiosyncratic information, raters should have little incentive to make drastic changes in their overall ratings of a technology. So, although we expect to find in Hypothesis 1 that the ratings will converge on a consensus, we do not expect material changes in the relative rankings of the technologies, since little idiosyncratic information will be shared, leading to Hypothesis 2, below.

H2: The relative rankings of technologies will remain stable from Round 1 to Round 2.

DATA AND METHODS

The instrument used to evaluate the technology was adapted a standardized technology evaluation template adapted from work by Professor Pat Dickson at Georgia Institute of Technology and Jeffrey Timmons (Timmons and Spinelli, 2003), students evaluated the technologies for their commercial potential. The instrument contains 40 items and 5 dimensions. Each item in the instrument has five levels, so the overall score from a technology could range from a minimum of 40 to a maximum of 200. The dimensions of the instrument included Market Potential (8 items; $\alpha = 0.72$), Technology Potential (6 items; $\alpha = 0.41$), Existing Competition (10 items; $\alpha = 0.71$), Potential Value (9 items; $\alpha = 0.84$), and Venture Development (7 items; $\alpha = 0.64$). Variations of the instrument had been used previously to evaluate technologies. For the purposes of this paper, we have focused on the aggregate score of the instrument, which should reflect the overall commercial potential of the technology.

The technologies represent a wide array of disciplines and were at various stages of development. All of the technologies were developed by both faculty and student inventors from across the campus. Later, in the Discussion section of the paper, we will talk about the tremendous benefits that both inventors and students derived from participation in the program. The inventions ranged from finite element analysis software (a technology often used to predict heat and wear properties of tools), to a new high-speed camera technology, to friction stir welding (a low-temperature technology wherein metals are joined together by actually stirring the two pieces together where they meet).

The data was collected in a summer course that had 21 students and 12 technologies to be evaluated. 19 of the students were in the MBA program, while two others were seniors at the undergraduate level. There were two rounds of evaluations, with the ultimate goal of identifying the top five technologies, which would then be passed on to a group of student interns who would set about writing business plans to commercialize the technologies as part of a paid internship funded through a Coleman Foundation grant. It should be noted that commercialization could include both the formation of a new firm or the licensing of a

technology to an existing firm. For the first round, each student was randomly assigned two technologies to evaluate. Although students were expected to do their own evaluation, they were encouraged to be collaborative in sharing data sources and other information in order to facilitate evaluations that were as deep and rich as possible.

After the first round, the results of the technologies were tabulated and the students were broken into five separate groups. At that point, all groups had access to all of the research and ratings done by all of the other students. The groups were not randomly assigned, but rather chosen so as to ensure a multi-disciplinary group that included, among other things, skills in financial analysis.

Under ideal conditions, interrater agreement is best measured in a tightly-controlled experiment with randomized assignments and stable groups of equal size. There are a variety of formulae designed to measure interrater agreement, including measures developed by Cohen (1960) for two raters; Fleiss (Fleiss) for many raters; and within-group agreement of raters of a single target (James et al, 1993). Unfortunately, none of these traditional measures of interrater agreement is appropriate for our study. Instead, we tested Hypothesis 1 by comparing the standard deviations of Round 1 ratings with those of Round 2 and doing an F-test to determine if there was a significant difference in the variances of the two rounds. Hypothesis 2 was tested by comparing means of the technology rankings.

RESULTS

Table 1 (below) shows the results of our test of Hypothesis 1. We predicted that the combination of multiple ratings, combined with increased familiarity of technologies, would lead to increased agreement among the ratings of technologies as we moved from Round 1 to Round 2. If such a phenomenon were to occur, we could feel more confident not only in our general ratings in the technologies, but also in our selection of the technologies that would be pushed forward for commercialization. As the two right-hand columns of Table 1 show, Hypothesis 1 was not supported and was in fact contradicted for six of the twelve technologies, indicating that the variability of ratings did not decrease when technologies were evaluated a second time.

Table 1 – Results of our test of Hypothesis 1. Each of twelve technologies was rated multiple times in two rounds of evaluation. Each time, the instrument used for evaluation was the same. The right-hand column shows that of the 11 technologies for which we obtained a standard deviation, only 5 had a lower standard deviation and 6 had a higher standard deviation in Round 2. Of the three changes in variance that reached significance in our F-tests, two of the three were actually increases in variance. Hypothesis 1 was not supported, and in some cases contradicted.

Technology	Evaluation Round	N	Minimum	Maximum	Mean	Std. Dev'n	Change in Std. Dev'n?	F-test of significance (p-value)
1	1	3	100.00	131.00	117.00	15.716	Decrease	13.72 (0.188)
	2	2	106.00	112.00	109.00	4.243		
2	1	3	136.00	139.00	137.33	1.528	Increase	0.023 (0.023)
	2	2	119.00	133.00	126.00	9.899		
3	1	12	110.00	157.00	131.42	17.804	Decrease	1.40 (0.489)
	2	3	134.00	164.00	149.67	15.044		
4	1	2	109.00	111.00	110.00	1.414	N/A	N/A

Table 1 – Results of our test of Hypothesis 1. Each of twelve technologies was rated multiple times in two rounds of evaluation. Each time, the instrument used for evaluation was the same. The right-hand column shows that of the 11 technologies for which we obtained a standard deviation, only 5 had a lower standard deviation and 6 had a higher standard deviation in Round 2. Of the three changes in variance that reached significance in our F-tests, two of the three were actually increases in variance. Hypothesis 1 was not supported, and in some cases contradicted.

Technology	Evaluation Round	N	Minimum	Maximum	Mean	Std. Dev'n	Change in Std. Dev'n?	F-test of significance (p-value)
	2	1	159.00	159.00	159.00	N/A		
5	1	3	119.00	128.00	123.00	4.583	Increase	0.067 (0.061)
	2	2	102.00	127.00	114.50	17.678		
6	1	2	143.00	151.00	147.00	5.657	Increase	0.444 (0.374)
	2	2	108.00	120.00	114.00	8.485		
7	1	3	127.00	175.00	144.67	26.388	Decrease	1392.67 (0.019)
	2	2	154.00	155.00	154.50	.707		
8	1	3	86.00	155.00	115.00	35.791	Decrease	1.684 (0.478)
	2	2	96.00	135.00	115.50	27.577		
9	1	3	131.00	152.00	142.33	10.599	Increase	0.308 (0.213)
	2	2	132.00	159.00	145.50	19.092		
10	1	3	123.00	133.00	126.67	5.508	Increase	0.029 (0.027)
	2	2	118.00	164.00	141.00	32.527		
11	1	3	99.00	136.00	116.00	18.682	Decrease	27.92 (0.132)
	2	2	117.00	122.00	119.50	3.536		
12	1	2	145.00	164.00	154.50	13.435	Increase	0.571 (0.471)
	2	3	121.00	156.00	136.67	17.786		

Table 2 (below) shows the results of our tests of Hypothesis 2. We predicted that the rankings of the various technologies would remain stable from one round to the next, but this hypothesis was strongly contradicted. Of the 36 different sets of rankings, fully one third of technologies moved up or down 4 or more places in the rankings. In a surprising five cases, technologies changed ranks by 8 or more places! These fluctuations in rankings occurred regardless of whether we used the minimum, maximum, or mean scores of each technology's ratings to determine rankings.

Table 2 – Results of our test of Hypothesis 2. Each of twelve technologies was rated multiple times in two rounds of evaluation. Each time, the instrument used for evaluation was the same. The table contains rankings of each technology for each of two rounds of evaluation. To further highlight the variability of rankings, we ranked technologies based on their minimum, maximum, and mean scores. Hypothesis 2 predicted that rankings would remain stable from one round to the next, but this was strongly contradicted. Of the 36 difference sets of rankings, there were only four that stayed the same from one round to the next, and fully one third of technologies changed rankings by four or more spots.

Technology	Round	Rank of Minimum	Change in Rank	Rank of Maximum	Change in Rank	Rank of Mean	Change in Rank
1	1	10	0	10	-2	9	-3
	2	10		12		12	
2	1	3	-3	7	-1	5	-2
	2	6		8		7	
3	1	8	+5	3	+2	6	+3
	2	3		1		3	

Table 2 – Results of our test of Hypothesis 2. Each of twelve technologies was rated multiple times in two rounds of evaluation. Each time, the instrument used for evaluation was the same. The table contains rankings of each technology for each of two rounds of evaluation. To further highlight the variability of rankings, we ranked technologies based on their minimum, maximum, and mean scores. Hypothesis 2 predicted that rankings would remain stable from one round to the next, but this was strongly contradicted. Of the 36 difference sets of rankings, there were only four that stayed the same from one round to the next, and fully one third of technologies changed rankings by four or more spots.

Technology	Round	Rank of Minimum	Change in Rank	Rank of Maximum	Change in Rank	Rank of Mean	Change in Rank
4	1	9	+8	12	+9	12	+11
	2	1		3		1	
5	1	7	-4	11	+2	8	-2
	2	11		9		10	
6	1	2	-7	6	-5	2	-9
	2	9		11		11	
7	1	5	+3	1	-5	3	+1
	2	2		6		2	
8	1	12	0	4	-3	11	+2
	2	12		7		9	
9	1	4	0	5	+2	4	0
	2	4		3		4	
10	1	6	-1	9	+8	7	+2
	2	7		1		5	
11	1	11	+3	8	-2	10	+2
	2	8		10		8	
12	1	1	-4	2	-3	1	-5
	2	5		5		6	

DISCUSSION

In the Results section above, both of our hypotheses were contradicted, indicating that two rounds of evaluation by multiple raters did not become more reliable after a second round of testing (Hypothesis 1) and did not remain consistent from one round to the next or appear to converge on a consensus (Hypothesis 2). Why these results occurred is unclear, especially given that the raters, technologies, and the instrument were the same from one round to the next.

One possible explanation for the variability and lack of inter-rater agreement is that these students were evaluating technologies for the first time, at least in the first round of ratings. In one case of a large change in the rankings, the technology in question dropped near the bottom of the group because of the discovery of a fatal flaw. Perhaps with time and experience, these students would start to deliver more reliable ratings of new technologies.

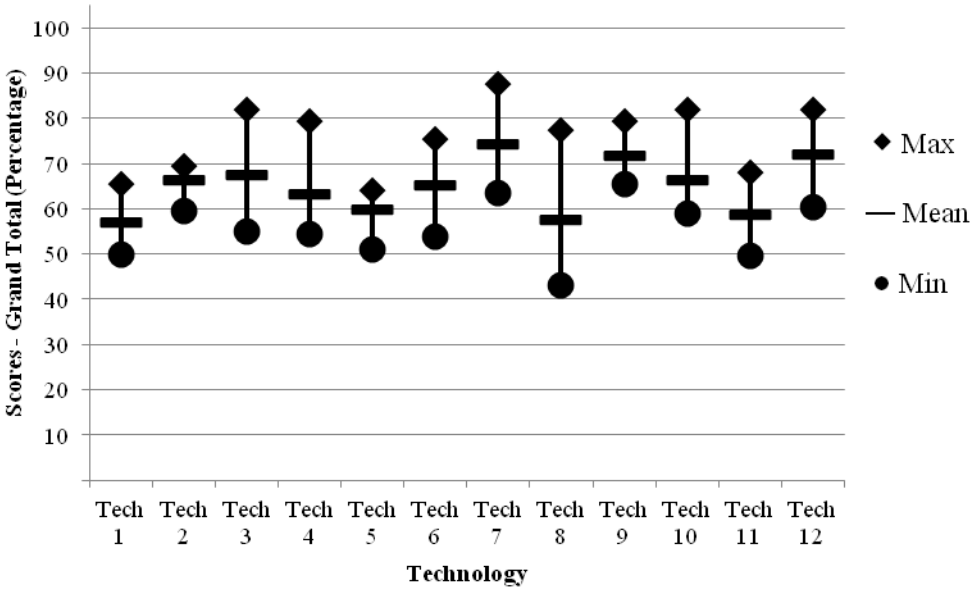
Implications for the Evaluation of Technologies

In addition to the results presented, Figure 1 (below) demonstrates visually just how challenging it is to draw conclusions about the commercial viability of technologies in our study. Despite the fact that our hypotheses were contradicted, we think that our results have important

implications for all organizations that evaluate technologies for their commercial potential and further development. Although the students were highly motivated and were given intensive and identical training on the technologies and the evaluation instrument, their ratings were highly variable and changed drastically from one round to the next. Ultimately, we do not know what the true commercial potential is of these technologies is, as this value will be revealed in the years to come as the technologies are further developed. It will be interesting in the coming years to compare the ratings of the technologies with the ultimate value generated by the technologies.

We believe that the variability of ratings could be improved through more extensive training and experience. This group of technologies was the first ever evaluated by the technology commercialization program at this university. The goal is to create a self-sustaining program where some of the most talented students from one year end up staying with the program to evaluate technologies and provide further training and mentorship as new students enter the program each year.

Figure 1 - Graph displaying the variability of ratings of commerical potential for the study's twelve technologies



Inventor, Student, and Faculty Learning Experiences

Although the paper to this point has focused on the measurement side of technology evaluation, the benefits of the program went far beyond the evaluation of the technologies. There were three different groups participating in the program that benefited immensely from their involvement: the students in the program, the inventors that supplied the technology disclosures, and the faculty teaching the course.

All of the inventions evaluated were developed across campus by faculty, students, and graduate students. None of the inventors were from the business school so, for most, this was

their first time viewing the technology from a commercial as opposed to a scientific point of view. Since the program was the first of its kind for the university, the inventors were extremely enthusiastic to see their inventions being evaluated and pushed closer to commercialization. Initially, we had asked the inventors for minimal involvement in the program, so as not to interrupt their work. For most inventors, though, the excitement of the program had them giving students tours of their lab, having formal meetings, and communicating via phone and email when students had questions about the technology they were evaluating.

At the end of the course, students presented commercialization plans for the most promising technologies, and many of the inventors, as well as senior university officials attended the presentations. Perhaps most exciting of all, when word spread about the success of the program, dozens of new technologies were submitted for possible commercialization. In fact, far more technology disclosures were submitted in the months following the start of the program than had been disclosed in the entire time the school had been collecting disclosures prior to the establishment of this program.

The course in which these evaluations took place was held in the summer. Consensus among the students was that this was by far the most work they had ever done for a course, but also found it the most rewarding. During the program, students got to meet personally with inventors, venture capitalists, entrepreneurs, as well as experts in intellectual property law. The students seemed to take real ownership of their assigned technologies, in part because the technologies were actual inventions that could lead to tremendous opportunities, not only for themselves, but for the inventor, and for the university. The top twelve students in the class were granted a $3,000 stipend to begin the process of commercializing the technologies, which undoubtedly contributed their dedication to the course. Although the results of the technology evaluations were somewhat mixed, students learned a tremendous amount about such things as determining market size, the management of intellectual property, and the importance of the assembly of an entrepreneurial team in order to push technologies forward to the market.

From a faculty standpoint, this course was team-taught by two faculty members. The course was a tremendous amount of work, but was also arguably the most rewarding course that either faculty member had taught. The coordination and timing of inventors, lining up of guest speakers, and balancing concerns about confidentiality and patentability made full use of both faculty members' time. It is hoped that the process can be streamlined over the years so that a single faculty member can balance all of the demands of the course. The potential to generate new jobs and interesting educational opportunities for students attracted considerable support from both university administration and the business community. As such, the faculty members were able to build ties across campus with other departments and build a stronger relationship between the university and the surrounding business community. Because the program generated so much interest from other inventors and the business community as a whole, the larger plan is to run the course multiple times per year and develop a self-sustaining office that can quickly and effectively evaluate new technologies as they are disclosed. The goal is to have the students who enroll in the course act not only as a source of evaluative power, but more importantly, that some of them will go on to become staff members in the technology commercialization office, or

perhaps even become part of an entrepreneurial team that decides to create a startup firm based on one or more technologies introduced in the program.

The Cautionary Tale of Measurement Error

The variability of the results suggests a very large probability of both false negatives and false positives when evaluating technologies. Assuming that some percentage of these technologies is truly valuable from a commercial standpoint and some other percentage are not valuable, the initial evaluation of commercial potential was highly unreliable. Depending on an organization's priorities, this suggests two possible strategies for handling new technologies. Firms most concerned with maximizing the chances of identifying commercial potential should consider further analysis of as many technologies as possible so as not to accidentally kill a viable technology. On the other hand, firms with limited resources where success is the primary goal and there is very limited ability to develop new technologies, it seems that these firms should perhaps look to include other methods of evaluation to supplement the one used here, since the results presented here are too variable with which to make any strong conclusions about any one of the technologies studied.

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INVOLVING THE ENTREPRENEURIAL ROLE MODEL: A POSSIBLE DEVELOPMENT FOR ENTREPRENEURSHIP EDUCATION

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ABSTRACT

This paper offers and discusses an alternative way to delivering entrepreneurship education to students in higher education institutions through the involvement of a role model(s) in entrepreneurship teaching and learning. A previous study with students in an Indonesian university showed that the role model is in position to give positive influence to their entrepreneurial motivation, and furthermore, the choice for a future career as an entrepreneur.

As a further development, this paper outlines a model whereby the appropriate role of the dominant entrepreneurial role models (who are parents, entrepreneurs and teachers/lecturers) are integrated one with the other and can be used as a source of an entrepreneurial learning process. The lecturer can take on the major task as the facilitator to encourage students to seek the appropriate knowledge about entrepreneurship in this integration whilst the other two constructs can take on their major tasks to act as sources of informal entrepreneurial learning (through social and active learning). Entrepreneurs in particular, can act as a 'business father or mother' to whom students can talk and with whom they can establish a longer informal relationship.

This paper argues that whilst this model can be implemented successfully it is critical that a suitable and proper institutional setting -in terms of curriculum arrangement -alongside the availability of supporting facilities and infrastructures be arranged and addressed to support it.

Keywords: entrepreneurship education, entrepreneurial role models, institutional setting

INTRODUCTION

Entrepreneurship has become an economic panacea seen as both generating employment and economic prosperity in developed and developing countries (Kuratko, 2005; Matlay, 2006). The growing interest in entrepreneurship teaching and research (Jones and English, 2004) simultaneously increased the enthusiasm of students for taking part in an entrepreneurship course. They have become the most popular course in the USA for college and university students, followed by small business management and new venture creation (Solomon, 2007). Entrepreneurship is offered as a specific subject of education to be delivered as it is believed that

education plays an important role in the process of entrepreneurial capacity (Hannon, 2006). This importance can be seen in the 2008 Global Entrepreneurship Monitor (GEM) which devoted their 2008 special topic to Entrepreneurship Education and Training.

Rae (2010) argued that universities and their provision of education and learning for entrepreneurship must respond to the new economic era and the subsequent global recession. To respond to this, entrepreneurship education should be prepared for all university students regardless of their majors in order to improve their competitive advantage, not only for themselves but also for the nations and societies in which they involved (Lee, Chang and Lim, 2005). Unfortunately, entrepreneurship is often delivered through a normative theory-based approach rather than the pragmatic approach that is more contextual, experiential and reflexive. So students are only equipped with knowledge *about* entrepreneurship to stand alongside their traditional business-management skills and knowledge (Taatila, 2010). Although scholars have developed and offered some contemporary ways for entrepreneurship teaching and learning, they also have realized that several factors (such as teaching and learning facilities and infrastructures, social and cultural influences, and curriculum) matter equally much in entrepreneurship education (see the studies of Higgins and Mirza, 2012, Carver, et al., 1996, Souitaris et al., 2007, Aronsson, 2004, Fiet, 2000, Jones-Evans et al, 2000, Jack and Anderson, 1999, Gorman et al, 1997,). One thing in principle is that entrepreneurship education should be better schemed, and therefore, it needs a proper and suitable institutional setting to foster delivery.

This paper offers an alternative for delivering entrepreneurship as a part of the education for students in higher education institutions by arguing that the role model can be involved in entrepreneurship education – as it relates positively to students' entrepreneurial motivation and the choice of a future career as an entrepreneur.

THEORETICAL OVERVIEW

Despite the problem of a lack of consensus over the definition of entrepreneurship which has resulted in a lack of a suitable pedagogical paradigm for entrepreneurship education, some scholars have tried to define what is entrepreneurship education, for example, Heinonen and Poikkijoki (2005): "e*ntrepreneurship education is the activities aimed at developing enterprising or entrepreneurial people and increasing their understanding and knowledge about entrepreneurship and enterprise"*.

Unfortunately, even this definition cannot resolve the question and debate about how entrepreneurship education should be carried out. In addition, Jones and Iredale (2010) also identified another problem that relates to entrepreneurship education. They identified the problem of terminology within the continuums of enterprise and entrepreneurship education by arguing that there should be a clear separation between 'entrepreneurship' education and 'enterprise' education as both of these display differences in their focus and objectives. In a research regarding the learning process in entrepreneurship education, Fayolle and Gailly (2007) have mapped the key dimensions of learning processes in entrepreneurship education and the alternative teaching models that can be chosen which are summarized in Table One. Combining these two approaches we conclude on the distinction between the entrepreneurship education and enterprise education continuum in Figure One.

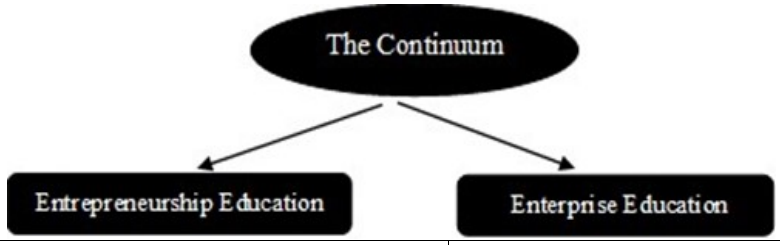
Although Figure One has clearly demonstrates the distinction, one thing the scholars have in common is the principle that the entrepreneurship education should rely on the adequacy regarding the objectives, characteristics of the audience and the existence of the institutional context that can influence contents and the constraints of entrepreneurship education. The tension

to be resolved should not be to find which terminology is the most suitable for use – but rather to explore and to focus on what are those suitable teaching and learning methods that will be effective in delivering the course(s), be it either entrepreneurship or enterprise education. Related to this, there does seem to be an informal understanding between scholars that the 'learning' approach which accommodates the formal and informal learning possibilities will be more successful in entrepreneurship education rather than the 'teaching' approach. Rae (1999) when considering a basic approach to entrepreneurship education and entrepreneurial learning for university students argued that the sources of entrepreneurial learning should be active, social and formal. He further proposed that there should be changes to the content of the courses from ordinary business skills-knowledge and understanding to the development of the students' entrepreneurial skills, attributes and behaviours. This is also supported by Gibb (1996) who said that the process of learning should also be shifted from the traditional learning processes into an "*entrepreneurial learning processes*". Thus, the challenge for entrepreneurship education is to establish, develop and maintain a system of learning (and assessment) that can add to the traditional ways of learning and developing its students with the skills, personality attributes and behavioural characteristic of the enterprising, or entrepreneurial, individual (Kirby, 2002).

Table 1
Key Dimensions of the Learning Processes in Entrepreneurship Education *(Adapted from Fayolle and Gailly, 2007)*

Learning process	**Key dimensions of the teaching model**
Learning to become an enterprising individual	•Entrepreneurship as a broad concept •Focus on spiritual dimensions (know why and know when) •Expected changes in attitude, perceptions and intention toward entrepreneurship •Large diversity of audiences: students in business & non-business fields •High importance of entrepreneurs as role models in the classroom
Learning to become an entrepreneur	•Entrepreneurship as a specific concept and professional situation (independent entrepreneurship, corporate entrepreneurship) •Focus on professional/practical dimensions (know what, know how, know who). •Learning by doing pedagogies. •Expected acquisition of skills, practical knowledge, techniques to act and succeed as an entrepreneur. •Expected development of entrepreneurial competencies •Main audiences: would-be entrepreneurs working or having a real and concrete entrepreneurial project
Learning to become an academic	•Academic conception of entrepreneurship •Focus on theoretical dimension •Didactical educational model •Discussion in the classroom of research issues •Main audiences: PhD students, teachers and researchers •Expected acquisition of theoretical and scientific knowledge

Figure 1
The Continuum of Entrepreneurship and Enterprise Education
(Adapted from; Jones and Iredale, 2010 and Fayolle and Gailly, 2008)



Orientation	New venture creation, growing and managing a business, self-employment acquisition of skills and knowledge to start and manage a business.	Development of skills & knowledge as an enterprising individual, the use of enterprising skills, behaviors and attributes in life and business
Focus	Starting, growing, managing business. Professional/practical dimensions in different contexts of life	Acquisition and development of personal skills, abilities and attributes to be used. Spiritual dimensions.
Learning process	Learning to become an entrepreneur.	Learning to become an enterprising individual
Key dimension of teaching models	Entrepreneurship as a specific concept and professional situation. Learning by doing pedagogies. Expected acquisition of skills, practical knowledge, techniques to act and succeed as an entrepreneur. Expected development of entrepreneurial competencies.	Entrepreneurship as a broad concept. Expected changes in attitude, perceptions and intentions towards entrepreneurship.

From the bundle of studies and research regarding entrepreneurship education amongst countries, Mwasalwiba (2010) summarised the general objectives of entrepreneurship education in various countries as comprising of: (a) increasing entrepreneurial spirit/culture/attitudes (34% amongst the recorded studies and research); (b) start-up and job creation (27%); (c) making a contribution to the society (24%); and, (d) stimulating entrepreneurial skills (15%). These objectives led to the possible choice of teaching methods, which can be categorized into traditional methods (comprising normal lectures) and innovative methods which are more action-based (Arasti, Falavarjani and Imanipour, 2012), or in another terminology, passive and active methods (Mwasalwiba, 2010). To name some detail teaching and learning methods in entrepreneurship, Pittaway and Cope (2007) through a Systematic Literature Review identified: the use of the classic approach (Benson, 1992); action learning (Leitch and Harrison, 1999); new venture simulations (Clouse, 1990; Kelmar, 1992); technology based simulations (Low, Venkataraman and Srivatsan, 1994; Hindle, 2002); the development of actual ventures (Haines, 1988); skill based courses (Ullijn, Duill and Robertson, 2004); video role plays (Robertson and Collins, 2003); experiential learning (Sexton and Upton, 1987; Daly, 2001); and mentoring (Stewart and Knowles, 2003). Lourenco and Jones (2006) further strengthen that mixture and collaboration of traditional approaches (lectures and seminars) by discussing transmissive

methodologies (Sterling, 2001:36) associated with the transfer of information through more enterprising and interactive approaches (company visits, in-depth discussions with real entrepreneurs, activities) which use transformative methodologies – so engaging learners in constructing and owning their learning – and so possibly providing the best learning style for nascent entrepreneurs. Arasti, Falavarjani and Imanipour (2012) found that case study and projects, (either group or individual), problem solving and a project for establishing new venture creation are the most appropriate methods for engaging students in entrepreneurship. Furthermore, reflecting on interactive approaches which use transformative methodologies, Kuckertz (2013) emphasized two possible prominent learning methodologies that may raise the entrepreneurial attitudes of students. They are firstly: the exposure of students in class to specific role models such as successful entrepreneurs (Aronsson, 2004, Souitaris et. al., 2007 and Carver, et. al., 2010). Related to the choice of role model entrepreneurs for students, Kuckertz (2011) further suggested that they are better to be: (a) younger entrepreneurs who are two or three years ahead of the student, and (b) those to whom students can easily relate. Secondly, project based learning (Gorman, et al., 1997) and learning by doing (Fiet, 2000), for instance, the involvement of students in actual start-ups or student consulting to entrepreneurs. As a possible further development in entrepreneurship education, Higgins and Mirza (2012) for example, suggested that entrepreneurial education should consider a more reflexive practice-oriented education agenda and approach that involve self-conception of what does it mean to be an entrepreneur.

THE CONSTRUCT OF ROLE MODELS, ENTREPRENEURIAL MOTIVATION AND A FUTURE CAREER AS AN ENTREPRENEUR

The concept of the entrepreneurial role model introduced by Gibson (2004) defined the role model, identified the dimensional approach of the role model, discussed characteristics that differentiate a role model from a mentor model or a behavioural model; and the reason why an individual is appointed to become a role model by other individuals. The definition of the role model as suggested by Gibson (2004) is *"a cognitive construction based on the attributes of people in social roles an individual perceives to be similar to him or herself to some extent and desires to increase perceived similarity by emulating those attributes"*.

However, Gibson (2004) did not further clarify the impact and relationship between the existence of role models and individuals, especially to individuals' entrepreneurial motivation and their possible future career to become an entrepreneur. The rationale and relationship between the construct of role model, entrepreneurial motivation (in particular students in higher education institutions) and possible future career as an entrepreneur was introduced by Rahman (2013). He identified several possible constructs of role model and found that some role models, indeed, have a positive relationship to entrepreneurial motivation and the future career choice to become an entrepreneur. This is shown in Table Two. In all matters, parents and entrepreneurs are the perfect people on whom the students can rely on for their future career and entrepreneurial motivation. The constructs of siblings, uncles/aunties and friends are in a moderate position to influence the future career of the student (meaning that siblings, uncles-aunties and friends can only give insights on entrepreneurial career but they have no 'personality power' to encourage the students to take any further actions into an entrepreneurial career). This circumstance has further led to the fact that these three constructs of the role model have no significant correlation to student entrepreneurial motivation. The '*ambiguous*' position is shown by the teacher/lecturer as a construct of role model. On the one hand, the students think their teacher/lecturer is one of the people who can influence their future career but on the contrary, they think their teacher/lecturer have no correlation to their entrepreneurial motivation. This indicates one thing: reputation of the

teachers/lecturers and their formal interrelationship with the students can only give insights to the future career of the students but not markedly influence their entrepreneurial motivation.

THE INVOLVEMENT OF ROLE MODELS IN ENTREPRENEURSHIP EDUCATION

The previous study by Rahman and Day (2012) implied that there is a possibility to use the role model construct in the social environment of an individual. Strengthening entrepreneurial motivation will further lead to strengthening the traits and personality of aspirant entrepreneurs.

Table 2
The Influence of the Construct of Role Models to Student Future Career Choice and Their Relationship to Student Entrepreneurial Motivation

No	Possible Degree of Influence for Future Career	Construct of role models according to their proximity to students						
		Very Close		Close				Not Known Personally
		Parents	Siblings	Uncles / Aunties	Friends	Boyfriends / Girlfriends	Teachers / Lecturers	Successful Entrepreneurs
1	Positive	√					√	√
2	Moderate		√	√	√			
3	Negative					√		

No	Correlation to Entrepreneurial Motivation	Construct of role models according to their proximity to students						
		Very Close		Close				Not Known Personally
		Parents	Siblings	Uncles / Aunties	Friends	Boyfriends / Girlfriends	Teachers / Lecturers	Successful Entrepreneurs
1	Positive	√						√
2	No correlation		√	√	√	√	√	

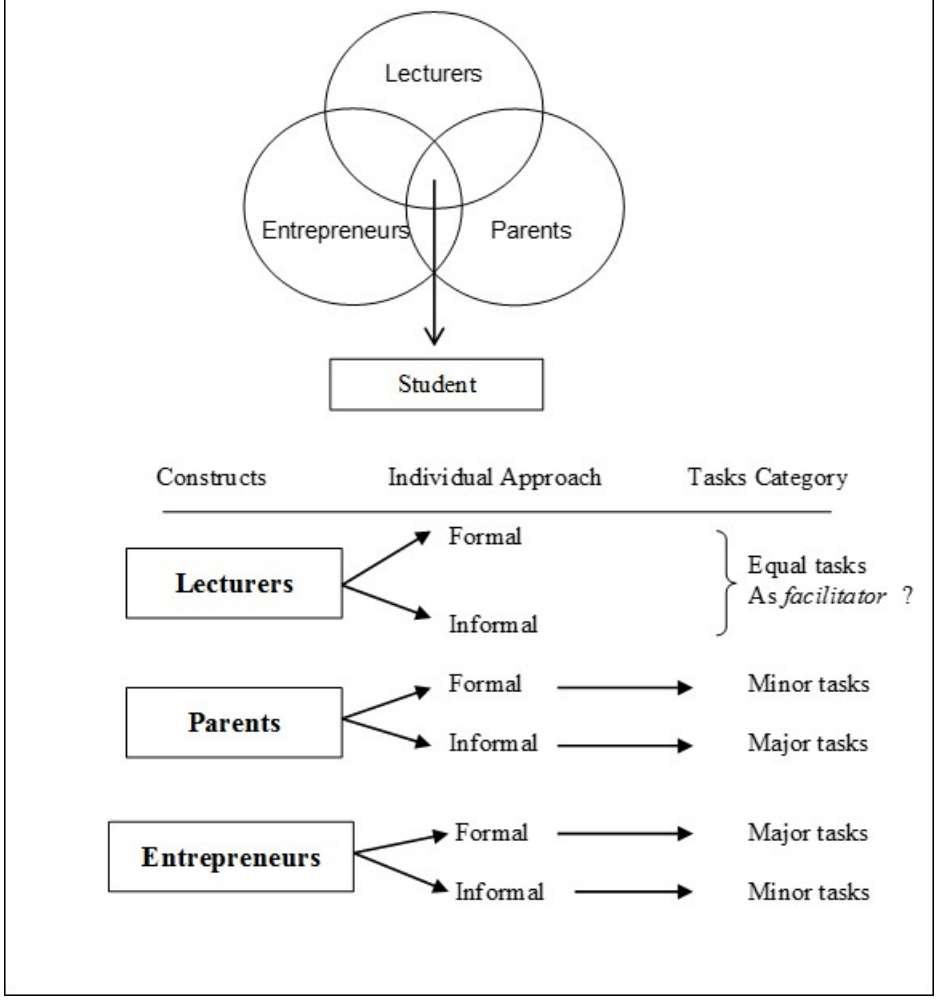
Consequently, the use of role model constructs in strengthening traits and personality of the aspirant entrepreneur should also be better *schemed* in suitable arrangements either in formal or informal ways. In a formal way, this will relate to the involvement of the role model construct in entrepreneurship education (teaching & learning, training, workshops and seminars), whilst in an informal way this relates to the consideration of the social culture in which norms, values and wisdoms are taking place. As argued by Kirby (2002), the challenge of entrepreneurship education is to develop a system of learning (and assessment) that complements the traditional ways of learning and developing students with the skills, attributes and behaviours characteristic of the enterprising or entrepreneurial individual. Edwards and Muir, (2004) further strengthened Kirby (2002). Therefore, an arrangement and possible scheme to involve and integrate roles of dominant entrepreneurial role models consisting of: (1) parents, (2) entrepreneurs, and (3) lecturers in entrepreneurship education can be identified. The roles can be seen as a possible *specific task* that can be carried out by each role model. Using *individual approaches* as the consideration, the integration of roles of the dominant role models with students can be viewed in the following figure.

Figure Two shows that students are positioned in the centre of integration between the three dominant role models and they can take benefits from this integration. Tasks that should be

done by each of the dominant role model are categorized into two categories: (1) *major tasks* and (2) *minor tasks*. The lecturer in this integration is in an important position as a *facilitator* who can facilitate the involvement of the two other dominant role models (parents and entrepreneurs). They may have a major task to encourage students to seek the appropriate knowledge in entrepreneurship and to become aware of entrepreneurship as a possible choice for their future career, and further, identifying and appointing possible and suitable role models who can share their experience in the classroom and establish a longer informal communication and interaction with students. As Aronsson, (2004), the role of educators is to foster entrepreneurial attitudes of their students, and so is less about changing them directly, but rather increasing awareness of entrepreneurship as an alternative career choice and creating an environment that can foster entrepreneurial behaviour. As a general qualification, the lecturer is better being a person who engages in business and management practice, or at least, who is aware of it. Most importantly, the lecturer needs to show and express a willingness to explore new frameworks of knowledge transfer and development. The major task of entrepreneurs is to expose the real world scenarios of becoming an entrepreneur, offer continuous practical assistance and advice and be ready to be a '*business' father or mother*' with whom students can establish a longer and an informal relationship.

The entrepreneur is appointed by the students as their role model through their recognising and considering that they have a solid reputation as an entrepreneur and possibly, charisma. Therefore, it becomes important that this entrepreneur would be better to be an educationally empathetic person; still relatively young; has had the business since establishment; and has a strong commitment to give their time and share their experience to guide the student. It is hoped that parents who are entrepreneurs get involved in this model as they are the most influential role model for students. The major task of parents can be related to developing and improving student awareness regarding entrepreneurship as a possible future career, to give insights about other work and jobs (apart from just being an employee) and to support the choice of the future career by students. As students appointed parents as their role model based on the reason of charisma, it would be important for them to offer an informal approach (communication and interaction) and in a longer timeframe to raise student awareness. Parents should be wise in their counsel and communicate and interact with students with respect for their plans for their future life. Therefore, parents who can act as friends would be needed in this task.

Figure 2
Role Integration of Dominant Entrepreneurial Role Models in Entrepreneurship Education



Interesting issues are raised for managing role models within the classroom. We have to manage a complex selection of role models; some of them will exert a physical and contemporary influence, (the guest entrepreneur). Others will have played a role in an environment outside of the classroom and their influence may be both now and in the past, for example, parents. So the educator needs to not only draw upon contemporary and previous influences but also to manage a range of internal and external influences whilst taking into account their relative impact on the student. Of course, an entrepreneurship (education) orientation has already made common the bringing of entrepreneurs into the classroom, however this is usually only for a limited and contained period of time. This paper implies that there should be more frequent interaction between students and entrepreneurs in the classroom. Such will allow the creation of the *closure mechanism* between students and entrepreneurs, whereby students will adopt and appoint entrepreneurs as their role model. There should also be a tripartite and close interpersonal relationship between teachers/lecturers-parents-entrepreneurs in guiding those students who have entrepreneurial projects, interests and motivation. Close cooperation between universities and actors (role models) would be a sensible route to choose, including actors outside of the traditional

classroom network both in reach and time. If parents are a large pre-university influence then should we reach out to them, and incorporate them, prior to their children attending university?

CONCLUSION

As our previous study, we found that students react positively towards the existence of role models for their entrepreneurial motivation and their future career to become an entrepreneur. We found that the constructs of parents, entrepreneur and teacher/lecturer are the most likely persons who can influence their entrepreneurial motivation and a future career in entrepreneurship. We believe that this could be used as an alternative way in entrepreneurship education and an associated entrepreneurial learning process by arguing that the involvement of role models will also be effective in entrepreneurship education. We offer a model where the role of dominant entrepreneurial role models is integrated in entrepreneurship education for students in higher education institutions – in which every role model has its own specific major and minor tasks. However, arrangements should be made for a proper, and suitable, institutional framework and setting to support its implementation, particularly in terms of curriculum arrangement alongside the availability of supporting facilities and infrastructures be arranged and addressed to support it.

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USING FORMAL INTERNSHIPS TO IMPROVE ENTREPRENEURSHIP EDUCATION PROGRAMS

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ABSTRACT

Student internships have the potential to benefit the student, the school, and the employer. While internships are sometimes offered within business curricula, more often than not they are simply an option and not a requirement. In this paper, we argue that internships should be incorporated into formal entrepreneurship education programs. Requiring internships can enhance student experiences and the chances for entrepreneurial success. We discuss the advantages and present a framework for differing internship programs in various types of universities. The end result can help strengthen entrepreneurship curricula and heighten the potential for successful new venture creation by post-graduates.

Keywords: Confidence, Entrepreneurship, Internship, Opportunity Recognition, Social Networking

INTRODUCTION

It has been suggested that internships should be a requirement for entrepreneurship students (Hiltebeitel, Leauby, & Larkin, 2000; Knemeyer & Murphy, 2001) because they allow students to better understand the connection between their studies and real world experiences, as well as provide benefits to the institution and the employer (Mello, 2006). An internship allows an employer to see the work ethic of the student without having to fully hire them into the company (Coco, 2000; Gault, Redington, & Schlager, 2000; Knemeyer & Murphy, 2001). Further, it can also benefit the institution by allowing them to build relationships with firms in the surrounding community (Divine, Linrud, Miller, & Wilson, 2007).

It may be especially important for entrepreneurship students, where there is a need to try to strengthen students in their alertness to opportunities, and ability to utilize their intuition (Hulbert, Brown & Adams, 1997). In many cases, entrepreneurship classes are taught by adjunct faculty members or instructors who specialize in other disciplines and who have not been fully exposed to entrepreneurship theory (Katz, 2003; Singh, 2008a). This may hinder the quality of entrepreneurship education that the student receives. Requiring internships can help strengthen the classroom discussion and lead to higher levels of new venture creation. In a study done by Weible (2010), almost 35% of entrepreneurship students that had an internship were more inspired to pursue a new venture after graduation, and over 85% of faculty who supervised internships felt that they were more a part of their business community.

While there would appear to be significant benefits to internships – particularly with respect to entrepreneurship students – very few business schools make internships a requirement prior to graduation (Weible, 2010). This is unusual because students understand the value of partaking in an internship (Hergert, 2009). In fact, about 82% of high school students are more

likely to attend a university that offers internship programs as opposed to those that do not offer one (Weible, 2010). Being aware of the need is not enough to make it truly beneficial for all parties involved. A structure needs to be created in order to ensure the optimal benefits are being gained (Hergert, 2009). In this paper, we discuss how internships add value to all parties involved, paying particular attention to students with an entrepreneurial focus, and the connection between internships and entrepreneurship theory. We conclude with a broad framework for effective internship programs within entrepreneurship education programs in differing types of universities.

THE VALUE OF AN INTERNSHIP PROGRAM

The first internship program can be traced back to 1906 at the University of Cincinnati (Gault, *et al.,* 2000; Thiel & Hartley, 1997). It was drawn from teaching practicums in the education field (Gault, *et al.,* 2000). Research has shown that students learn the difficulty in trying to differentiate themselves when they try to find a job after college, and often use internship experience to do just that (Cannon & Arnold, 1998). While some internships are for education credit, they are offered as an option in 90% of all colleges (Cook, Parker, & Pettijohn, 2000; Divine, *et al.,* 2007; Gault, *et al.,* 2000). However, not all students choose to work through an internship. A study by Coco (2000) showed that of the schools offering an internship program, less than 50% of students actually completed one. Faculty members understand the benefits that can be gained from internships (Divine, *et al.,* 2007), but only 6% make it a requirement (Weible, 2010). When it is offered as an elective, it is often up to the student to find the company to work for. This can present a challenge, which may be a reason why students often choose not to do an internship (Divine, *et al.,* 2007).

The Association to Advance Collegiate Schools of Business (AACSB) recognizes internships as one of the ways that business schools can and should connect with the real world (Hergert, 2009). An undergraduate degree is seen more and more as a bare minimum requirement for the vast majority of entry-level positions (Cannon & Arnold, 1998). Employers demand proficiency in teamwork with culturally diverse individuals, expertise in information technology, and outstanding communication abilities (Wood, Farmer, & Smith, 2000). Schools should not assume that students have the capability to understand how to apply theory in practice (Hergert, 2009). While there is still reluctance among some university administrators to fully support internship programs (Gault, *et al.,* 2000), it is one of the best ways to provide synergy in benefits for both the student intern and the employer (Coco, 2000).

There is a cost advantage to both students and employers through experience gained and opportunity to assess the likelihood of fit without the long-term commitment (Divine, *et al.,* 2007). It is not only a trial period for the employer, but also the student, without having to fully become an employee (Coco, 2000). It allows employers to utilize students as resources during busy periods (Divine, *et al.,* 2007). Internships can also be a useful strategic tool to fill human resource needs during weaker economic periods (Gault, *et al.,* 2000). For students who work through an internship, they gain valuable "real world" experience and can reduce the adjustment period that occurs when going from the classroom to the work environment (Joseph, 2003; Taylor, 1988). It also makes students more marketable by providing exposure and allowing them to gain experience with specific job related skills (Garavan & Murphy, 2001). Internships have even been known to increase ambition, lead to more job satisfaction, and more stability (Gault, *et al.,* 2000; Hergert, 2009). Offering optional internships results in the more academically

ambitious students being the main ones that pursue it, when in reality the less ambitious, academically, would probably benefit the most (Devine, *et al.*, 2007). It also aids in securing a post-graduation position in more selective career choices and options (Hergert, 2009). On average 30% of graduates receive job offers prior to graduating, but the percentage rises to 58% if the student has participated in an internship (Coco, 2000). Internships often complement a student's coursework and in-class discussions can benefit as students discuss their internship experiences within a class setting (Coco, 2000; Divine, *et al*., 2007).

Colleges can also benefit by being the recipient of scholarship and grant money, as well as equipment donations from the companies that establish a relationship with the school through internships (Thiel & Hartley, 1997). An internship program can help with job placement of graduates, which also helps the school with ratings (Coco, 2000). It essentially provides a connection with the community that could lead to employers becoming a part of a school's advisory board (Divine, *et al.*, 2007), or reduction in class sizes by allowing students to utilize local resources (Thiel & Hartley, 1997). It can even extend to finding potential guest speakers and funding for research (Divine, *et al.*, 2007; Gault, *et al.*, 2000). This can, in turn, provide good word-of-mouth for the company (Pianko, 1996). The potential benefits of internship programs do not stop there. Table 1 provides a summary of the benefits for students, universities, and employers.

TABLE 1: BENEFITS OF INTERNSHIPS

To the Student	To the Institution	To the Employer
1. Potentially earn money while receiving a learning experience (Thiel & Hartley, 1997)	1. Enhance the qualifications of professors (Divine, *et al.*, 2007; Thiel & Hartley, 1997)	1. reduce turnover (Crumbley & Sumners, 1998; Knemeyer & Murphy, 2001)
2. Better interpersonal skills (Beard & Morton, 1999 *from Divine, et al., 2007)* (Thiel & Hartley, 1997) (Gault, Redington & Schlager, 2000)	2. Keeping faculty up-to-date on the community (Divine, *et al.*, 2007)	2. Ability to evaluate potential employers prior to full-hire (Divine *et al.*, 2007; Gault, Redington, & Schlager, 2000)
3. Faster job placement and advancement (Coco, 2000; Taylor, 1988)	3. Assists in fundraising potential (Coco, 2000; Gault, Redington, & Schlager, 2000)	3. Showing social responsibility to the community (Thiel & Hartley, 1997)
4. Higher personal as well as social skills (Beinstein, 1976 *from Hall et al. 1995 p. 41*) (Page, Geck & Wiseman, 1999)	4. Can lead to company donations (Thiel & Hartley, 1997)	4. Strengthens relationships with universities (Divine *et al.*, 1996)
5. Greater satisfaction (Taylor, 1988)	5. Enriched classroom conversation from student interns (Swift & Kent, 1999)	5. Highly motivated workers (Coco, 2000; Gault, Redington, & Schlager, 2000)
6. More assured career path (Hall, Stiles, Kuzma, & Elliot, 1995; Page, Geck & Wiseman, 1999)	6. Potentially increase enrollment through the attraction of the required offering (Divine, *et al.*, 2007)	6. Commitment to the profession (Crumbley & Summers, 1998)
7. Improved industry knowledge (Coco, 2000; Divine, *et al.*, 2007)	7. Employers utilized as a source of knowledge for classroom discussion (Thiel & Hartley, 1997)	7. "Cross fertilization of ideas" (Thiel & Hartley, 1997, p. 20)
8. Professional development (Page, Geck, & Wiseman, 1999)	8. Attract nontraditional students (Thiel & Hartley, 1997)	8. Ability to create brand loyalty among those involved (Thiel & Hartley, 1997)
9. More maturity and confidence (Thiel & Hartley, 1997)		9. Inexpensive resources of student interns (Coco, 2000)
10. More job offers "(Coco, 2000; Swift & Kent, 1999; Taylor, 1988)" *from Divine et al., 2007* (Thiel & Hartley, 1997)		

11. leadership skills (Cook, Parker, and Pettijohn, 2000 *from divine 2007)* (Gault, Redington & Schlager, 2000 12. job acquisition skills (Divine, 2007) (Gault, Redington & Schlager, 2000 13. Better equipped and more qualified (Divine *et al.*, 2007; Taylor, 1988) 14. Higher starting salaries (Taylor, 1988)		

Entrepreneurship-Focused Internships

As discussed above, internships offer a wide range of benefits, but these benefits may be of particular importance to students who focus on entrepreneurship. Entrepreneurship entails aspects that are seen as laying the groundwork for economic advancement. These aspects include things "such as an innovative approach to problem solving, high readiness for change, self-confidence and creativity" (Heinonen, 2007, p. 310). With the interest in new venture creation and entrepreneurship growing (Katz, 2003; Singh, 2008a), there is a shift toward more periods of freelance, contractual, self-employment, and project-specific work (Heinonen, 2007). As the importance and relevance of the entrepreneurship field increases, the need for an applicable structure within the field has never been greater (Heinonen, 2007).

We believe that an entrepreneurship-focused internship can be broadly defined. One may work in a family-owned business, a non-profit business, a franchise, an innovative firm, or an imitative firm. However, for all such internships, the university should focus on setting up internship opportunities with small business owners to allow direct contact with the owners of the company. In fact, universities should work with firms who allow student interns to work with the owner or top management rather than the lower level employees. This would provide first-hand experience in the way the company is run on a daily basis, allowing for interns to better comprehend the complex environment (Plumly, Marshall, Eastman, Iyer, Stanley, & Boatwright, 2008).

In order to be successful, entrepreneurship students must grasp, as well as accept, the challenges that will present themselves within an atmosphere that focuses on risk-taking and creativity (Plumly, *et al.*, 2008). This has led some to call for a more non-traditional approach to educating entrepreneurship students (Plaschka & Welsch, 1990; Plumly, *et al.*, 2008); one which allows students to experience entrepreneurship (Plumly, *et al.*, 2008). The environment within entrepreneurship is highly unstructured and unsure. Thus, extensive first-hand experience within the community is more beneficial for students to be able to add value to real endeavors (Plumly, *et al.*, 2008).

These types of internships can also enhance student learning. Many entrepreneurship faculty members have been formally trained in the broad management fields (i.e., organizational behavior, organization theory, HR), marketing, and finance, and did not receive formal training in entrepreneurship theory during their doctoral program (Singh, 2008a). This is likely to change as the number of entrepreneurship courses being offered at the university level continues to increase, and there are increasing numbers of outlets for journal publications (Heinonen, 2007;

Katz, 2003; Singh, 2008a); however, the number of academically trained faculty with knowledge of entrepreneurship theory – while growing – is not keeping up with growth in academic programs (Singh, 2008a). This presents an educational challenge that can be partially addressed through internships. More specifically, students who may not be exposed to faculty well-grounded in entrepreneurship theory, can benefit from the practical education and experience that comes from internships.

Any successful entrepreneurship internship program needs to be "geared toward creativity, multidisciplinary and process-oriented approaches, and theory-based practical applications. It should focus on being more proactive, problem-solving, and flexible in its approach rather than . . . . [a] functional approach" (Plaschka & Welsch, 1990, p. 61). A more interactive and experiential method will allow students to better comprehend the various situations and issues faced by entrepreneurs (Plaschka & Welsch, 1990; Plumly, *et al.*, 2008). It can provide a connection for the student between theory and practice, and strengthen the quality of class discussion (Divine, *et al*., 2007; Fender & Watson, 2005). This can help bring outside experience into the classroom. The professor could then function as a facilitator at times by making connections with textbook material and/or their knowledge of the academic literature. Internships can also allow students to assess whether or not an entrepreneurial venture is something they actually want to pursue after graduation (Divine, *et al.,* 2007; Fender & Watson 2005; Gault, *et al.*, 2000; Taylor, 1988). As a result, the student may learn more about the entrepreneurial process prior to going through new venture creation on their own.

An internship allows students to set up contacts prior to graduation within a certain industry, and have better knowledge of the market (Divine, *et al*., 2007; Gault, *et al.*, 2000). Even if a student does not decide to pursue a new venture after graduation, he or she will still have the ability to think entrepreneurially (Ulrich, 2009). Entrepreneurially minded, or "champions" as they are termed in corporate entrepreneurship, are those individuals that facilitate connections, embrace ideas, and encourage individuals during the entrepreneurial process (Dess & Lumpkin, 2005; Lumpkin & Dess, 1996; Ulrich, 2009). With the more decentralized, rapidly innovative and ever changing society of today, there is also a need for firms to develop corporate entrepreneurship within their own companies, and entrepreneurial graduates are often pursued because of their cross-functional capabilities (Singh, 2008a). An entrepreneurship-focused internship can also help with interview skills, social networking, and the creative thinking process as a whole (Gault, *et al.*, 2000). In no other program are these skills more essential than in the field of entrepreneurship (Ulrich, 2009).

LINKING INTERNSHIPS AND ENTREPRENEURSHIP THEORY

We described the elements and some of the potential benefits of entrepreneurship-focused internships in the previous section; we expand on the discussion by linking such internships to entrepreneurship theory concepts. While there are many potential benefits, we focus our attention on four additional areas that could be significantly impacted by entrepreneurship internships – new venture creation by minority and women, opportunity recognition, social networks, and entrepreneurial confidence. These are not the only benefits that could be derived from entrepreneurially-focused internships, but we use them to illustrate the broader implications and how it may be possible to increase new venture creation and improve the potential success rate of future entrepreneurs who have experienced an entrepreneurship-focused internship.

Minority And Female Entrepreneurship

Every year in the United States there are over 500,000 new ventures started (Reynolds, 2000). However, Singh (2008b) points out that over 50% of all new ventures fail within the first five years of operation. Approximately 12% of whites are self-employed compared to just 4% of blacks, and the depressed rate of entrepreneurship within the black community has been fairly constant for decades (Bates, 1995; Fairlie, 1999; Fairlie & Meyer, 2000). Improving the rate of entrepreneurship within the African American community is particularly important when one considers that over the last 50 years, the African American unemployment rate has consistently remained about double that of white Americans (Badgett, 1994; Hoynes, 2000; Spriggs & Williams, 2000). Last year, U.S. Census Bureau (2012) statistics showed that, again, among all self-employed people, 86% were white and just 5% were black. It also showed that just 35% of self-employed people were women. With women and the African American community showing a lack of established self-employed businesses consistent with the percentages they makeup within the American population, a closer look into why these difference are so significant is needed.

The lower self-employment rate of black people and women can be explained, in part, by the fact that there are so few entrepreneurs who can serve as role models or mentors (Singh, Crump & Zu, 2009). There is a vicious cycle in which there are so few models of black and female entrepreneurs who can mentor younger individuals like themselves that it limits the number of future black and female entrepreneurs. By its nature, entrepreneurship is an unstructured activity that requires a wide range of skills and abilities. One needs everything from passion to knowledge of markets to industry experience to financial resources to be successful as a business owner. Entrepreneurial role models and mentors can help serve as informal sources of information that be tapped to overcome the challenges and difficulties faced by entrepreneurs. For black and female individuals who may not have access to entrepreneurs like themselves within their social networks, an entrepreneurship-related internship may be the answer. Although not necessarily critical, they may even be able to find a demographically similar entrepreneur who can provide them with guidance that may shepherd them through the pre-founding stage of their business.

Opportunity Recognition

Opportunity recognition has been identified as a key component of entrepreneurship (Baron, 2006; Lehner & Kaniskas, 2012; Shane & Venkataraman, 2000). The process of venture creation focuses on taking potential ideas, and having the ability to enhance them into a profit-seeking potential business opportunity (Singh & Hills, 2003). Entrepreneurs are constantly scanning for changes in the environment, and look for ways to exploit these changes (Gaglio & Katz, 2001). They have often gained the information necessary to identify these opportunities from prior experience and comprehend the potential future value (Shane & Venkataraman, 2000). From this perspective, entrepreneurial opportunities are discovered, not because entrepreneurs have special characteristics, but because prior knowledge allows certain people to discover them over others (Shane, 2000). This would suggest that experience within an industry is critical to successful opportunity recognition.

With industry experience, one can gain information and specialized knowledge about the industry that can lead to more successful entrepreneurship. Obviously an entrepreneurship-related internship can provide useful information to would-be entrepreneurs, it is an individual's

knowledge base and available information that allows for the possibility to make a risky or more conservative decision, not their individual traits (Shaver & Scott, 1991). Bhave (1994) pointed out that this whole process of recognizing an opportunity does not occur in a linear way. Opportunity recognition is a relational and collectively formed process (Fletcher, 2006). People create meaning and establish value through their understanding of reality through social construction (Fletcher, 2006; Gaglio & Katz, 2001). In fact, one of the most important resources that a company can have is the personal social network of the founding entrepreneur (Singh, Hills, Lumpkin, & Hybels, 1999).

Social Networks

We touched on the importance of mentors who may be a part of an entrepreneur's social network earlier, but social networks provide much more than just mentors. A social network is comprised of people or firms that are connected through a social relationship that can provide information and knowledge (Sequeira, Mueller, & McGee, 2007). We all have limits to what we can know. No economic actor has perfect information with which to make rational choices and decisions; individuals are limited in their ability to process and store information which results from bounded rationality (Simon, 1976). Nonetheless, one's social network can help expand the boundaries of rationality by allowing access to knowledge from which to assess and determine a course of action. Through one's network ties, a solid business idea/opportunity can be identified, screened and assessed, and then, if appropriate, acted upon (Singh, *et al.*, 1999). The more people within someone's social network the more opportunities that can be recognized (Singh, *et al.*, 1999). Additionally, a person's social network allows for a recognized opportunity to be evaluated and potentially refined during the formulation process (Hills, Lumpkin, & Singh, 1997).

The ability to recognize an opportunity is the ability to identify a profit-oriented possibility that involves either starting a new venture or dramatically changing an existing one, which can occur at any time (Singh, *et al.*, 1999). A previous study done by Singh and Hills (2003) suggested that contacts within a nascent entrepreneurs' social network were used as a source of ideas in almost 70% of all instances. Another study done by Robinson and Stubberud (2009) suggested that a man's social network mostly includes professional acquaintances, while a woman's social network encompasses friends and family. Thus, a woman's social network is generally more informal and less likely to provide specific or beneficial information in a particular field (Robinson & Stubberud, 2009). The quality of the social network, therefore, has an effect on the types of opportunities that are feasible. This suggests that if a person has more work-related people within a person's social network they are more likely to recognize entrepreneurial opportunities.

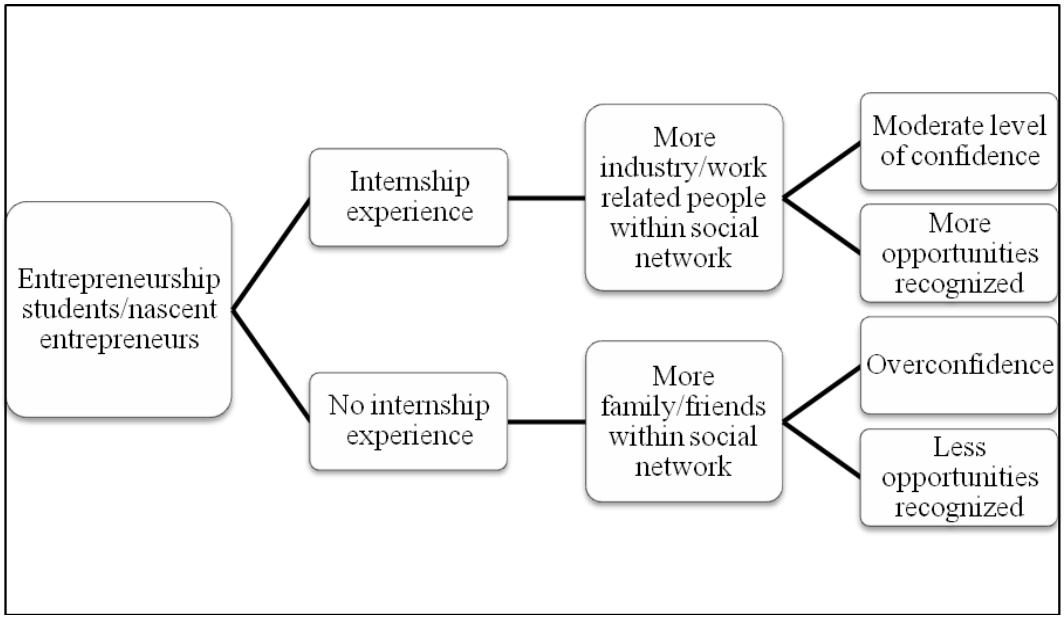
Not only do potential entrepreneurs need to recognize an opportunity, they also need to have the resources necessary in order to carry it out. Hulbert *et al.* (1997) point out the three necessary resources as financial, human, and operating. While the creative combination of these three resources is the responsibility of the potential entrepreneur, the resources must exist in order to do so. Social networks within a professional environment allow for more potential access to these three types of resources, and most certainly, working in an entrepreneurial internship should help students connect and interact with professional contacts who may be able to help them in the future as they try to found their ventures.

Entrepreneurial Confidence

Hayward, Shepherd, & Griffin (2006) indicated that while the potential for failure is very high, potential entrepreneurs are still pursuing new opportunities because they feel that it will not happen to them. Based on "hubris theory," individuals often exhibit overconfidence and still pursue their ventures even though the odds are against them (Hayward, *et al*, 2006). There is a positive relationship between industry experience and success (Singh, 2008b). Those entrepreneurs without industry experience are more likely to have overconfidence, and essentially underestimate the amount of resources needed and risk taken on (Hayward, *et al.*, 2006; Singh, 2008b). Internships can provide a more realistic understanding of the work environment through hands-on industry experience (Svinicki & McKeachie, 2011). While it is important to have a certain amount of confidence, having too much can be problematic, and overconfidence increases the likelihood of failure (Hayward, *et al.*, 2006; Singh, 2008b). Since confidence is socially constructed, it will have an impact on the way potential entrepreneurs construe information (Hayward, *et al.*, 2006). That is, information that is consistent with what a confident entrepreneur believes is given great weight, but information that may not be consistent with what he/she believes is devalued and discounted. An entrepreneurship-related internship creates the environment for more potential opportunities to be recognized, but also can help to moderate confidence. Students that work through an entrepreneurship-related internship should have more realistic expectations of what is involved, making them less likely to suffer from overconfidence.

Figure 1 provides a model based on the effect of social networks on opportunity recognition and confidence level as described above.

FIGURE 1: EFFECT OF INTERNSHIPS



Network-centered learning is an important aspect of education (Taylor & Thorpe, 2004), especially within the field of entrepreneurship. The ultimate success is only allowable when all parties involved understand its value and are committed to the process (Crumbley & Sumners,

1998). The research will continue to grow as the awareness of internship benefits increases (Gault, *et al.*, 2000). In the next section, we propose a framework for structuring entrepreneurship internships based on characteristics and the type of university.

STRUCTURING INTERNSHIPS TO MATCH UNIVERSITY TYPE

There is agreement among faculty, students and recent graduates that an internship is the most effective recruiting strategy for a school (Scott, 1992). As discussed earlier, internships can enhance an institution's reputation (Weible, 2010), but there are challenges (Scott, 1992). Thiel and Hartely (1997) point out five barriers to successful internship programs based on responses from students, universities, and employers. These barriers include the issue of it being optional for students, interns and faculty often do not take internships seriously, employers do not see themselves as an important mentor role, and the inconsistency in expectations for all involved (Theil & Hartely, 1997). Additionally, some schools see internships as simply another part-time job, thus giving students an easy 'A' towards course work (Gault, *et al.*, 2000). It is thought that these "programs lack sufficient quality control across departments varying widely in terms of education, supervision, organization, and cost" (Gault, *et al.*, 2000, p. 52). Moreover, some interns do not take the opportunity seriously, businesses view them as inexpensive labor, and school supervisors sacrifice time that does not seem to provide benefit to them (Hall, Stiles, Kuzman, & Elliot, 1995). While some universities invest time and effort in finding and preparing students for an internship, if the company is not prepared, it can ruin the experience for the student (Coco, 2000). The problem lies in inconsistent expectations between interns, universities, and firms due to unclear standards (Hall, *et al.*, 1995). Some professors feel that internships require a lot of effort without much benefit to them (Hall, *et al.*, 1995). All of these issues point to the need to have formalized programs with clear objectives that institutionalize best practices.

Everyone involved must be willing to take responsibility and be accountable for the success of the process in order for internships to provide the potential benefit (Fender & Watson, 2005). Having a required internship program means more than just requiring students to participate; universities must create a standard for all students to participate in which allows for a valuable learning experience. The unfavorable elements of internships described above can be avoided with programs that are meticulously designed through clear objectives, standard evaluation methods, and adequate content (Gault, *et al.*, 2000).

The ideal faculty coordinator would define the goals and course of action, and maintain close contact through quality engagement throughout the process (Hall, *et al.*, 1995). Appropriate construction of the program allows employers to have a positive opinion of the university (Gault, *et al.*, 2000). The employer can rely on the faculty members involved for a guarantee of the structure of the program, reducing their need to spend excessive time on trying to create an appropriate format. Required internships would then provide an understanding of the importance to employers with an emphasis on implementing the appropriate structure, as well as having the ability to deliver students that need the internship (Divine *et al.*, 2007). It is in the best interest of the school to ensure as much of a uniform process as possible for all students (Divine, *et al.*, 2007). Having a standardized program for all students will reduce the dissatisfaction for all parties involved after the internship is over (Gault, *et al.*, 2000).

As previously mentioned, an entrepreneurship-related internship would have unique features that would differentiate it from a standard internship. It would focus on establishing the program with small business owners. This would allow the intern to really see what management

does day to day in order to run the business. During the establishment of the agreement between the school and university, it would additionally be emphasized that the intern would be assisting the owner or upper management. Even if the company is not very successful, the intern could still gain valuable knowledge of the difficulty in owning your own business. Having this focus is not enough to gain the most benefit. The university also needs to emphasize the importance of the program.

Universities should implement formal internship programs. However, this does not mean that one structure should be used by all schools. It should be tailored to fit each individual school. Divine *et al*. (2007) provides a model for allowing schools to assess how their current structure fits within the better fit/worse fit framework. Generally, it shows that schools with a research orientation, budget constraints, high percentage of part-time students, weak assessment culture, longer distance from employers, and focus on promoting the brightest students (we label these schools at "Type 1" schools) are not ideally suited for internship programs (Divine *et al*., 2007). On the other hand, schools that are equally or more focused on teaching rather than research, enjoy a strong budget, have a high percentage of full-time students, have a strong assessment culture, are in close proximity to employers, and are student-centered with a focus on assisting all students (Type 2 schools) would be a good fit for making internships a requirement.

However, we believe that internships can provide value for not only the 'good-fit', but also the 'worse fit' type of school, as identified by Divine *et al.* (2007). Internships can be required in both types of schools, but structured in a way that will heighten the benefits for each type of school. A structure based on whether the school meets certain criteria should first be determined, and then an applicable program can be put into place.

The structure of an entrepreneurship-related internship program should be based on the school's fit with either Type 1 or Type 2, rather than a good fit/worse fit analysis. The criteria for a Type 1 school would be identified as the same criteria that Divine *et al.* (2007) identified in their discussion of 'worse fit,' and the criteria for a Type 2 school is based on the criteria that they address as 'good fit' for an internship program. Additionally, the internship program structure should be viewed as a continuum, where a Type 1 school would be on one extreme of the continuum as a less formal/short-term type of program, while a school fitting all the criteria for a Type 2 school would be on the other extreme as a more formal/long-term type of program. As Table 2 shows, we believe there are certain criteria that fit better with the certain internship type.

TABLE 2: INTERNSHIP TYPES FOR UNIVERSITY PROGRAMS

Criteria	**Type 1 University**	**Type 2 University**
Orientation	Research orientation	Teaching orientation
Budget	Weak budget	Strong budget
Part-time vs. Full-time	High percentage of part-time students	High percentage of full-time students
Culture	Weak assessment culture	Strong assessment culture
Proximity	Distance from employers	Closeness to employer
Focus	Showcasing the brightest students	Benefits for all students
Internship Type	**Less Formal/Short Term ⟷ More Formal/Long Term**	

**Part of this table is derived from Divine, et al., 2007.*

A structure more applicable for less formal/short-term internship type would be similar to the 'Quality Model,' which was originated from the Longwood College School of Business and Economics (Wood, *et al.,* 2000). Within this program each student was required to complete at least a week of work experience within their specific concentration. This allowed every student to have some exposure in their field prior to graduation. Longwood College administrators felt that this part of the requirement was important because employers actually want to have recent graduates that are well rounded in their interests, exposure, and open-mindedness (Wood, *et al.*, 2000). While this would only be a week, it would require some preparation for the program in the beginning. There must be a uniform focus on ensuring clear objectives, standard evaluation forms, and specific content (Gault, *et al.,* 2000). The professor must also work closely with the organizations, and provide structure details to employers (Gault, *et al.,* 2000; Hall, *et al.,* 1995). The key is to get employers to systematize internship activities and evaluate students throughout the process, which benefits both companies and the students them in the end (Crumbley & Sumner, 1998). For students in Type 1 schools, entrepreneurship-related internships should be short-term internships (as short as one week), but still require evaluation forms, clear objectives, and standardized work assignments.

At the other end of the continuum of schools would be Type 2 schools, where a more formal, comprehensive, and long-term internship program would be a better option. Thiel and Hartley (1997) identified a more extensive process that entailed recruitment, preparation of the students, locating potential employers, strategically placing students with the appropriate internship, introductory meetings for each specific location, assignments and assessment, and overall program outcomes. Obviously, greater resources are needed and having a more student-centered teaching mission is more consistent with this level of program planning. When this type of program was implemented at Robert Morris College (a Type 2 college), Thiel and Hartley (1997) found it to be successful. In the end, more formal/long term internship programs take all the requirements of the less formal/short term programs, but extend the duration of the internships. Viewing the types of schools as more of a continuum and trying to determine where one fits on the continuum is a key to structuring the right type of internship program. Not every school will fit within the criteria of a Type 1 or Type 2 school, and because of that, flexibility in the program structure is needed. In this paper we are deliberately broad in our discussion because requiring an internship is a major step that requires a lot of planning and there is a wide range of universities. Given the relatively novel discussion, we feel it is better for universities to self-determine where they fit on the continuum between Type 1 and Type 2 universities and develop their own plans for internship programs.

Again, we want to point out that entrepreneurship-related internships should not be the same as common internships. The distinguishing difference between a standard internship in the business program and one specific to students with a focus in entrepreneurship should be the students' access and ability to work with the actual entrepreneur. The opportunities to benefit from this interaction are more likely to take place in smaller companies where entrepreneurs often have to deal with a wide range of issues. In addition, Plumly, *et al.*, (2008) indicated that only 25% of new jobs came from large businesses, while entrepreneurial small business owners were responsible for the other 75% of net new jobs created. This is consistent with the finding that entrepreneurs sustain 50% of the growth in the U.S. economy (Headd & Kirchoff, 2009). Allowing students to learn from these important job creators who are vital to U.S. economic fortunes can be invaluable.

A required internship program, regardless of where the school fits on the continuum, would allow universities to be more responsive to societal demands, as emphasized by the AACSB (see Hills & LaForge, 1992). A college degree no longer ensures a position post-graduation (King, 1997). Even if students are hired after graduation, there is an increasing salary gap between recent graduates with internship experience and those without (Gault, *et al.*, 2000). Employers are expecting more and more from graduates, and experience through internships is still one of the most important resume builders that graduates can offer their potential employers (Gault, *et al.*, 2000). If students see the importance of the program through the emphasis that the faculty and employers make, they will take a much more active role, allowing this form of learning to be more effective (Ulrich, 2009).

CONCLUSION

While internships are often available for students in business schools, we believe that there is a need to make it a requirement for entrepreneurship students. As we have discussed in this paper, there are many benefits to students, universities, firms, and society in general. Simply providing internships as a voluntary activity limits the educational and economic value that can be created through well-structured entrepreneurship-related internship programs. More specifically, entrepreneurship student learning can be enhanced with direct access to entrepreneurs who are dealing with day-to-day decisions for their firm, universities can build links to their local communities, firms can gain valuable human resources and possibly creative solutions from energetic students, and for society in general, the result may be better prepared entrepreneurs who help move the economy forward.

Entrepreneurship is an inherently practical pursuit and just as doctors must complete residency programs, so to can students gain insights and knowledge from experiencing entrepreneurship through the type of internship that we have discussed throughout this paper. We drew from the entrepreneurship literature and theory to show how internships can improve the chances for success of new entrepreneurs, But as we also pointed out, there should be flexibility in the type of internship program based on the type of university and its student body. Certainly one size does not fit all when it comes to the right type of entrepreneurship-related internship. Whether a university has a research or a teaching mission, whether it is in a college town or an urban area, whether it has significant financial resources or not all play a part in the type of internship program it can and should offer. That said, we believe that all entrepreneurship programs should require some form of entrepreneurship-related internship to its students.

We hope our discussion will lead faculty and business school administrators to consider offering entrepreneurship-related internships within their curricula. If and when this happens there will be greater opportunities for research and assessment of programs and outcomes in order to find best practices. This can further refine the broad model we present and improve the types of internships that can be offered.

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ENTREPRENEURSHIP EDUCATION LITERATURE IN THE 2000S

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ABSTRACT

There seems to be a gap in the literature on entrepreneurship education that prevents it from making stronger contributions towards practice. This study addresses this issue by reviewing the state of the art about entrepreneurship education through the analysis of the contributions made over the 2000s.

Theoretical contributions on entrepreneurship education have been increasing and improving in terms of scope and methodology, but there still seems to be a lack of articles that expand knowledge by simultaneously making new theoretical propositions and testing those propositions in new experimental settings.

Articles centered on the development of methods, programs, and frameworks often reflect experiences that are context-specific; empirical validation, when offered, is usually limited to those specific contexts. Theory-building and theory-testing are rooted in single paradigms, limiting the generation of more complete and eclectic knowledge. Entrepreneurship education seems to be more focused on what works in the classroom than on developing cutting edge theoretical contributions. Several lines of inquiry are proposed in order to push the boundaries of existing paradigms and trends and improving practice through theory-building.

The present work contributes to the literature by providing an overview of the current state of the field, highlighting main trends and gaps. The application of a taxonomy based on the Business and Management literature to analyze theoretical contributions in the field of entrepreneurship education is original and can provide a means for evaluation of progress in the field over time.

INTRODUCTION

Entrepreneurship education has progressed in great strides and has spread widely around the world in recent decades. This proliferation has been supplemented by increasing diversity in pedagogic approaches and an increasing number of courses addressing special subjects within the entrepreneurial process (Vesper and Gartner, 1997; Katz, 2003). Entrepreneurship is now a well-established academic discipline (Gartner and Vesper, 1994; Fiet, 2000b) and a legitimate course of study (Vesper and Gartner 1997; Katz, 2003).

Theory-building and its role in the advance of entrepreneurship education has been a longstanding concern in entrepreneurship education research, as emphasized by several authors (e.g. Sexton and Bowman, 1984; Hills, 1988; Katz, 2003). Theory-building is the process by which theoretical contributions are generated, tested and refined (Gioia and Pitre, 1990). Theoretical contributions are one of the frequent prerequisites of top-tier journals and are fundamental to the advance of the field.

Whetten (1989) highlights the importance of theory in challenging and advancing scientific knowledge and guiding research, and contends that "the theory development process and criteria for judging theoretical contributions need to be broadly understood and accepted so that editors and contributors can communicate effectively" (Whetten, 1989: 495). Over the years there have been a number of efforts to communicate the ingredients for a good theoretical contribution in the field of management, and different frameworks and writings have been put forward. Significant contributions include: Whetten (1989); Van de Ven (1989); Eisenhardt (1989); Gioia and Pitre (1990); Weick (1995); Kilduff (2006); Colquitt and Zapata-Phelan (2007); Rindova (2008); and Corley and Gioia (2011).

Gioia and Pitre (1990) presented different approaches to theory-building, founded on different paradigms, earlier proposed by Burrel and Morgan (1979). Kuhn (1970), Burrel and Morgan (1979) emphasized the importance to use several paradigms to analyze the organizational phenomenon, avoiding a biased vision of the reality. Béchard and Grégoire (2005) emphasize the lack of established paradigms in the early stages of theory development in the field of entrepreneurship. Ireland et al. (2005), claim that, in general, entrepreneurship research is characterized by low paradigm development. In turn, Busenitz et al. (2003: 237), referring to research into multiple fields in entrepreneurship, conclude that "no powerful unifying paradigm exists, nor do multiple coherent points of view." Weick (1995) argues that in low paradigm fields of research it is sometimes difficult to build theory and, most important, to discern whether the work produced is theory.

On the other hand, literature reviews are important to organize and analyze recent research and also to reflect about the course of future developments, such as Dainow (1986) and Gorman et al. (1997) emphasize. However, there have been no impactful literature reviews on entrepreneurship education over the last decade. It seems, therefore, a good time to provide a analysis of the progress in the field, focusing on the analysis of theoretical contributions produced. In an attempt to close existing gaps that prevents this literature from making stronger contributions towards practice, we develop this study, by reviewing the state of the art in theory-building about entrepreneurship education, through the analysis of the contributions made over the last decade, following several author's contributions and appeals (e.g. Whetten, 1989; Van de Ven, 1989; Fiet, 2000a, 2000b; Rindova, 2008). This study also attempts to anticipate future problems by identifying the main gaps in the literature, and offers some suggestions for future challenges or avenues for further research.

Some recent works have analyzed trends in theory-building in management sciences and proposed different frameworks of analysis. For instance, Colquitt and Zapata-Phelan (2007) look at articles published in the Academy of Management Journal (AMJ), while Corley and Gioia (2011) analyze literature from the Academy of Management Review (AMR). Despite the fact these analyses are based on wider time periods, this paper uses a different approach, focusing on the last 11 years (due to the significant developments in entrepreneurship education on the last decade); applying those frameworks to entrepreneurship education research; and, extending the analysis to a much wider range of journals.

The paper is organized as follows. First the elements of theory-building that guide the analysis are briefly discussed; second, the methodological approach is presented; third, a typology of contributions is established; fourth, the content of theoretical contributions is analyzed; and finally, results are discussed and conclusions are drawn, as well as the implications and limitations of the study are discussed, suggesting avenues for future research.

ELEMENTS FOR AN EXAMINATION OF CONTRIBUTIONS

Although there are many definitions of the concept of theoretical contribution, there is no universal definition. According to Corley and Gioia (2011: 15), "the idea of contribution rests largely on the ability to provide *original insight* into a phenomenon by advancing knowledge in a way that is deemed to have *utility* or usefulness for some purpose." This study builds upon Rindova's (2008: 300) definition: "What makes a contribution novel is not that no one in the field ever thought about a given idea but that the idea is articulated, organized, and connected in a way that suggests new directions for researchers who, hopefully, are already thinking about it."

In order to analyze and assess theoretical contributions, this study produces a taxonomy built upon contributions and frameworks published in the AMR and AMJ, which are among management's leading conceptual journals in the Web of Science Journal Citation Reports for 2011, both in terms of impact factor and article influence score.

Taxonomy

Colquitt and Zapata-Phelan (2007) develop a taxonomy that is applied to the theoretical contribution of empirical articles. This taxonomy is based on two dimensions – theory-building and theory-testing – and encompasses five categories: "reporters", "testers", "qualifiers", "builders", and "expanders". The quotation marks are henceforth dropped from the text when referring to these categories.

Reporters have low levels of theory-building and theory-testing, and are usually related to replications of conflicting findings in past research. Testers have high levels of theory-testing and low levels of theory-building, and test existing theory in different contexts or samples. Qualifiers have moderate levels of theory-testing and theory-building, and qualify relationships or processes established in past research. Builders have high levels of theory-building and low levels of theory-testing, and include inductive studies that develop new constructs, relationships or processes. Builders can also include hypothetical-deductive studies that analyze a relationship that has not been analyzed before. Expanders have high levels of theory-building and theory-testing, focusing on constructs, relationships or processes that have not yet been theorized, while also testing existing theory. Builders, testers, and expanders make greater theoretical contributions when compared to reporters and qualifiers, whose theoretical contributions are lower.

Colquitt and Zapata-Phelan (2007) use this taxonomy to analyze trends in the theoretical contributions of AMJ articles over the past five decades finding an increase in theory-building and theory-testing in management research. Reporters have been replaced by qualifiers and expanders, which have become the most impactful articles. Builders have also increased, outpacing testers. It is important to examine entrepreneurship education literature in order to ascertain what types of articles (with regard to the weight of theory-building) have been published most frequently. While there may be a feeling that most works on entrepreneurship education are merely reporters, an examination of the recent literature might provide a different insight. An emergence of builders without a concomitant increase in testers can cause a "construct proliferation" which is not very desirable in a low paradigm field with an already fragmented literature (Pfeffer, 1993).

Assessment

Paradigms

According to Kuhn (1970), and Burrel and Morgan (1979) analysis based on only one paradigm or one way of understanding the organizational phenomenon tends to produce incomplete knowledge, especially when referring to the multifaceted nature of organizational studies and realities. Burrel and Morgan (1979) distinguish four paradigms: interpretivist and radical humanist, related to a subjective approach to reality, and radical structuralist and functionalist, related to an objective approach to reality. Gioia and Pitre (1990), applied these intellectual foundations to theory-building issue, arguing that there are different approaches to theory-building founded on different paradigms.

The interpretivist paradigm describes and explains, in order to diagnose and understand, and theory-building typically consists of substantively describing emerging concepts and relationships and showing how it all fits together. The radical humanist paradigm describes and critiques in order to revise and change the perception of reality, and theory-building usually consists of writing up dialectical analyses and showing how the level of consciousness should change.

The radical structuralist paradigm aims to understand, explain, criticize, and actively revise the structure of reality. Under this paradigm, theory-building usually consists of writing up rhetorical analyses and showing how established practice should change. In the functionalist paradigm, the goal is to search for regularities and test them in order to predict and control reality, and theory-building usually consists of writing up results and propositions, describing the regularities observed, testing these propositions, and showing how the theory is refined, supported or disconfirmed.

Most theory development is based on functionalism. However, this paradigm should not be seen as the best suited, universal approach for theory-building. Also, while theoretical perspectives based on a single paradigm should be recognized as original, they jeopardize an eclectic and holistic vision of reality. Gioia and Pitre (1990) propose a metaparadigm perspective of theory-building in which shared areas between paradigms (transition zones) exist allowing for diverse paradigmatic views, regardless of whether the viewer is typically rooted in the assumptions of a particular paradigm.

Building Blocks

Whetten's (1989) contribution to theory development remains influential and provides a standard for assessment of the consistency of theoretical contributions. Based on previous contributions to theory development (e.g. Dubin, 1969), this author suggests that good theoretical contributions are based on four building blocks: "what" refers to the identification of factors, variables, constructs and concepts that must be taken into account in the explanation of the phenomenon, while respecting the criteria of comprehensiveness and parsimony; "how" refers to an explanation of the way in which the previous factors are related, and the development of patterns of causality; "why" refers to the description of the underlying dynamics beyond the proposed factors and causal relationships; and "when" refers to the temporal and contextual factors that condition the propositions of the theoretical model and represent the range of the theory.

"What," "how" and "when" describe and constitute the domain or subject of theory, providing a framework for interpreting patterns or discrepancies. "Why" embodies the theory's assumptions and explanations, representing the elements of the theory subject to empirical testing, and specifying the implications for research of a theoretical argument. Assessment of current literature on entrepreneurship education requires an analysis of whether the research has responded to the challenge of "why," i.e. whether it has produced new insights with implications for further research that can be subjected to empirical examination across a variety of settings.

RESEARCH METHOD

Sources And Coverage

This analysis focuses on academic articles published over the period 2000-2011 on the subject of entrepreneurship education in higher education. This time period is particularly relevant since the last decade has seen significant developments in entrepreneurship education with the creation of a large number of programs inside and outside business schools, plus a variety of courses covering specific subjects within entrepreneurship (such as, for instance, opportunity recognition, business models, and entrepreneurial finance). Also, the last impactful reviews of the subject were carried out in the late 1990s (for instance: Gorman et al., 1997, and Fiet's (2000a, 2000b).

Articles are drawn from peer-reviewed journals in the subject categories of Business, Management, Education and Educational Research. Most of these journals are listed in the ISI Web of Knowledge. The selection of articles was carried out with the objective of covering the widest possible range of journals in the fields of Management and Education integrating theory and empirical articles about entrepreneurship education (methodologies, theories, contents, frameworks and evaluation of programs/subjects). Interviews, reports, introductions to special issues, and presentations were excluded. Table 1 outlines the stages pursued in the review methodology. Two searches were conducted: the first search was carried out on the websites of the most prestigious journals in each of the areas listed above, according to ISI impact factor (specifically, all the journals with a 2010 five-year impact factor greater than the aggregate impact factor for the ISI subject category where the journal is primarily listed were included); the second search covered business and academic databases (such as EBSCO), thereby adding more journals to the initial sample.

Table 1 Review Methodology	
Stage	**Description**
Selection process	
1st Search	
1	In the ISI Web of Knowledge (Journal of Citation Reports 2010 – Social Sciences Edition) list of journals, the following subject categories (journal type) were selected: Education and Educational Research; Management; and Business.
2	Journals were also selected that were not indexed on ISI Web of Knowledge, but included relevant articles about the topic, such as: *Higher Education in Europe*, *Teaching in Higher Education*, *Journal of Enterprising Culture*, *International Journal of Entrepreneurship Education*.
3	A search was conducted for articles that met four criteria: (1) peer review; (2) use of one or more of the following keywords in the title or abstract: "entrepreneurship education;" "educating entrepreneurship;" "teaching entrepreneurship;" "entrepreneurial university;" "entrepreneurship faculty;" "academic entrepreneurship;" "university entrepreneurship;" "enterprise education;" and "entrepreneurialism"; (3) publication between 2000 and 2011, inclusive; (4) focus on entrepreneurship education methodologies, theories, contents, frameworks and evaluation of programs/subjects.
2nd Search	
4	Search in business and academic databases (such as EBSCO) for articles integrating theory about entrepreneurship education, using the above mentioned keywords.
Data analysis	
5	The data were 'cleaned' by excluding interviews, book reviews, editorial notes reports, introductions to special issues, and presentations. Articles that do not look at entrepreneurship education per se (such as works focusing on university administration and technology commercialization) were also excluded. The searches resulted in a set of 152 articles that met the selection criteria.
6	Articles were then read and analyzed. A total of 92 studies were dropped from further analysis since they did not meet the criteria described in (3), 60 articles remaining in the final set.
7	A first database of all relevant articles was created and additional information such as the article title, its author(s) details, the journal, the year of publication and an overview of the article were recorded.
8	After a content analysis of the articles, a second database was created and articles were coded according to: purpose, sample/data used, data analysis/procedures, findings, consistency of the theoretical framework and participation in the programs (mandatory vs. elective).
9	All the articles of the database were reviewed and coded by the authors according to the taxonomy created, on two separate occasions, with four-month gap between reviews. After an article was coded the second time, the coding was compared to its original coding. In over 90 per cent of cases, codings were the same; differences were due to more consistent application of selection criteria. In a meeting, the coding was compared and discrepancies were discussed in order to reach a consensus.

Following the procedure adopted by Busenitz et al. (2003), Coviello and Jones (2004) and Ireland et al. (2005), the searches were based on keywords associated with entrepreneurship education in the article title or abstract. The keywords were: entrepreneurship education;" "educating entrepreneurship;" "teaching entrepreneurship;" "entrepreneurial university;" "entrepreneurship faculty;" "academic entrepreneurship;" "university entrepreneurship;" "enterprise education;" and "entrepreneurialism". Examples of articles that were excluded from the review because they did not focus on entrepreneurship education per se (for instance, works focusing on university administration and technology commercialization) include Shane (2004) on university patenting, and Powers (2004) on technology transfer, among others.

To ensure reliability, following Dainow's (1986), all the articles in the database were reviewed and coded by the authors according to the taxonomy created, on two separate occasions, with a four-month gap between reviews. After an article was coded the second time, the coding

was compared to its original coding. In over 90 per cent of cases, codings were the same; differences were due to more consistent application of selection criteria. In a meeting, the coding was compared and discrepancies were discussed in order to reach a consensus. This procedure yielded 60 peer-reviewed articles from 29 journals with the distribution shown in Table 2.

Table 2
Distribution of Articles per Peer-reviewed Journals

Subject Category	Journal Name (abbreviation)	No. of Articles
Business and Management	*Entrepreneurship & Regional Development (ERD)*	2
	Entrepreneurship Theory & Practice (ETP)	1
	European Economic Review (EER)	1
	International Entrepreneurship Management Journal (IEMJ)	9
	International Journal of Business and Globalization (IJBG)	1
	International Journal of Entrepreneurship and Small Business (IJESB)	1
	International Journal of Entrepreneurship Education (IJEE)	1
	International Review on Public and Nonprofit Marketing (IRPNM)	1
	International Small Business Journal (ISBJ)	1
	Journal of Business Venturing (JBV)	4
	Journal of Economic Behavior & Organization (JEBO)	1
	Journal of Enterprising Culture (JEC)	2
	Journal of Small Business and Enterprise Development (JSBED)	1
	Journal of Small Business Management (JSBM)	1
	Research in Business and Economics Journal (RBEJ)	1
	Research Policy (RP)	1
	Silicon Valley Review of Global Entrepreneurship Research (SVRGER)	1
	Small Business Economics (SBE)	1
	Technology Analysis & Strategic Management (TASM)	1
	Technovation (T)	2
Education And Education Research	*Academy of Management Learning & Education (AMLE)*	6
	European Journal of Education (EJE)	1
	European Journal of Engineering Education (EJEE)	2
	Higher Education (HE)	1
	Higher Education in Europe (HEE)	3
	Industry & Higher Education (IHE)	9
	Journal of Education for Business (JEB)	1
	Journal of European Industrial Training (JEIT)	2
	Research in Higher Education (RHE)	1

Analysis

The analysis is divided into two parts. First, a taxonomy of articles is based on the contributions set out in subsection 2.1. The taxonomy is based on theory generation, i.e. articles

are classified according to whether they attempt to make a significant theoretical contribution, as follows:

1. Articles that do not attempt significant theory-building – reporters – mostly include case studies that offer insights into a specific context and do not try to generate theory (as identified by Eisenhardt, 1989) and general appraisals of the practice of entrepreneurship education;
2. Articles that provide empirical tests of previously existing theory in new experimental settings – testers;
3. Articles that propose new theory, whether derived from case studies, observations and perceptions of established practice, or empirical regularities – builders and qualifiers, and expanders. Builders and qualifiers are grouped together in the analysis since the parameters employed for analyzing theoretical content are similar, and qualifiers are relatively rare (in fact, none is identified in this analysis). In general, qualifiers include articles that add cumulatively to the constructs, relationships, and processes described by previous research, while builders introduce new constructs, relationships, and processes.

The second part of the analysis examines the nature and character of theory-building presented by the articles surveyed. This examination is twofold. First, the content of theoretical contributions is examined using Whetten's (1989) building blocks as a reference. The objective is to assess whether recent research on entrepreneurship education has contributed to conceptual elevation and unification. Second, the foundations of theory-building in each paper are classified according to the paradigms described by Gioia and Pitre (1990). Specifically, the roots of the theory developed in each paper are examined, in order to determine whether there is a dominant paradigm (interpretivist, radical humanist, radical structuralist, or functionalist), or whether the paper applies a metaparadigm perspective to theory-building. Table 3 outlines the taxonomy developed.

TYPOLOGY OF CONTRIBUTIONS

Some of the articles surveyed directly address the practice of entrepreneurship education by focusing on programs, methods, frameworks, and models. Other papers address the relationship between entrepreneurship education and other subjects of entrepreneurship research, including entrepreneurial intentions, attitudes, motivations, and propensity. This analysis does not reflect this separation, since it focuses primarily on the type and nature of contributions, and not on the specific insights generated.

Reporters

Most reporters are case studies. Eisenhardt (1989) distinguishes between two types of case studies: those that intend to generate or build theory from data presentation, and those that offer insights of a specific context and do not intend to generate theory. The articles surveyed for this paper that are based on case studies are entirely descriptive, presenting different realities as examples of good practices, and are not intended to generate theory.

Table 4 outlines the reporters surveyed. The case studies describe methods (Bager, 2011; Carey and Matlay, 2011; Clarke and Underwood, 2011); programs and subjects (Rasmussen and Sorheim, 2005; Bonnet et al., 2006; Heinonen et al., 2007; Harkema and Schout, 2008; Papayannakis et al., 2008; Hyclak and Barakat, 2010); and entrepreneurial universities (Etzkowitz, et al., 2000; Miclea, 2006; Stankovic, 2006; Philpott et al., 2011). When addressing a theoretical framework, some are very concise (e.g. Papayannakis et al. 2008; Hyclak and Barakat, 2010),

while in others, theoretical considerations are spread throughout the text (e.g. Heinonen et al., 2007). In some instances, reference to theory is non-existent (e.g. Miclea, 2006; Stankovic, 2006;

Table 3
Taxonomy of Theoretical Contributions

Taxonomy	Description		
Reporters	Descriptive analysis; replicate past findings		
		Content	**Foundation**
Testers	Test existing theory in new contexts	What, How, When, & Why	Interpretivist, Radical Humanist, Radical Structuralist, Functionalist, & Metaparadigm
Builders & Qualifiers	Development of new constructs, relationships or processes, and restriction/moderation of established relationships or processes		
Expanders	Development of new constructs, relationships or processes, while also testing existing theory		

Procedures

1. **Description:** articles are classified according to whether they attempt to make a significant theoretical contribution (reporter, tester, builder and qualifier, expander);
2. **Content:** articles with significant theoretical contributions (testers, builders and qualifiers, expanders) are examined according the content of theoretical contributions using Whetten's (1989) building blocks as a reference;
3. **Foundation:** articles with significant theoretical contributions (testers, builders and qualifiers, expanders) are classified according to the paradigms described by Gioia and Pitre (1990).

Clarke and Underwood, 2011). However, there are also case studies that present a well-defined, consistent theoretical framework supporting and contextualizing the reality being studied (e.g. Etzkowitz et al. 2000; Rasmussen and Sorheim, 2005; Philpott et al. 2011).

Other reporters examine the progress of entrepreneurship education in institutional terms, focusing mostly on supply and demand. Among these, Katz (2003) develops the most comprehensive chronology of entrepreneurship education (1876-1999), while Kuratko (2005) proposes some trends and challenges for the 21st century. Some reporters analyze the general state of entrepreneurship education in different countries (Redford and Trigo, 2007; Klandt, 2004; Klandt and Volkmann, 2006; Solomon, 2007), while others focus their analysis on the institutionalization of the field (Finkle and Deeds, 2001; Finkle, 2010). Most reporters have a consistent, well defined framework, with the exception of Klandt's (2004).

Table 4
Outline of the reporters surveyed

Authors	Year Published	Journal	Main findings
Case Studies			
Etzkowitz et al.	2000	RP	Comparative analysis between USA, Latin America, Europe, and Asia links the emergence of the "triple helix" framework with the development of an entrepreneurial paradigm in universities.
Rasmussen & Sorheim	2005	T	A case study of entrepreneurship education in Switzerland, focusing on learning-by-doing and action-based activities.
Bonnet et al.	2006	EJEE	A study of entrepreneurship training at Delft University of Technology focused on engineering innovation and sustainability.
Miclea	2006	HEE	A study of asymmetries in entrepreneurial attitudes at Babes-Bolyai University, focusing on the clash between individual entrepreneurialism and institutional barriers.
Stankovic	2006	HEE	Basic description of entrepreneurial initiatives at the University of Novi Sad.
Heinonen et al.	2007	IHE	Study of the application of an entrepreneurship-directed educational approach in Finland's universities finds that participating students increase their entrepreneurial potential. Student's entrepreneurial intentions influenced the way they perceived program's objectives.
Harkema & Schout	2008	EJE	Examines the foundations of entrepreneurship education carried out at the Center of Excellence in Innovation & Entrepreneurship at the University of Professional Education in The Hague. The competence-based program is based on a constructivist perspective and learner-centered theories where students are stimulated to create their own goals.
Papayannakis et al.	2008	EJEE	Study of the experience in curricula design and implementation for entrepreneurship education at National Technical University in Greece.
Hyclak & Barakat	2010	IHE	Study of the design and implementation of high tech entrepreneurship curricula at Cambridge University.
Bager	2011	IEMJ	Presents a case study of three different Danish training programs aimed at team building, creativity, and innovation promotion.
Clarke & Underwood	2011	IHE	Study of the introduction of volunteering opportunities into business ethics and enterprise modules to develop students' skills in real-life entrepreneurial cases.
Carey & Matlay	2011	IHE	Examines the emergence of online social media in pedagogy, and the roles of risk and responsibility in the assessment and support of business ideas.
Philpott et al.	2011	T	Study of the emergence of an entrepreneurial university, highlighting the divide between disciplines (science, engineering and medicine vs. social sciences and business).
Other Reporters			
Finkle & Deeds	2001	JBV	Finds that, from 1989 to 1998, both the demand for and the supply of entrepreneurship faculty have increased in the US, even though there has been no mandate from the American Assembly of Collegiate Schools of Business for the incorporation of entrepreneurship into the curriculum of all accredited schools.
Katz	2003	JBV	Finds that, in the US, the entrepreneurship education has reached maturity, but growth is likely outside business schools and outside the US. Proposes that there are too many journals, a narrowing

			focus on top-tier publications and a shortage of faculty overall exacerbated by a shortage of specialized doctoral programs.
Klandt	2004	AMLE	Finds that, from 1998 to 2002 the number of professorships in entrepreneurship has increased in German-speaking Europe.
Kuratko	2005	ETP	Identifies trends and challenges in entrepreneurship education for the 21st century, including: a maturity/complacency/stagnation trap; a research/publications dilemma; and a faculty pipeline shortage.
Klandt & Volkmann	2006	HEE	Reports an increase in the number of entrepreneurship chairs at universities in Germany in the period of 1998-2004.
Redford & Trigo	2007	SVRGER	Reports trends in the development of entrepreneurship education in Portugal.
Solomon	2007	JSBED	Compares the results of a 2004/2005 survey of entrepreneurship education in the US with previous (1977-2000) national surveys, finding that, as the growth trend continued, the use of technology and the Internet started playing a major role in the field.
Finkle	2010	RBEJ	Reports an increase in US faculty positions in entrepreneurship from 1989 to 2008, as well as in candidates. Entrepreneurship tenure track positions have increased when compared with Finkle and Deed's (2001) initial study, suggesting that the field of entrepreneurship is becoming more institutionalized.

Testers

Table 5 shows a summary of the testers surveyed. Most testers examine theories that are not directly associated with entrepreneurship education, focusing instead on entrepreneurial intentions (Oosterbeek et al., 2010; Rodrigues et al. 2010; Sánchez, 2011; Giacomin et al. 2011; Liñán et al. 2011; Lanero et al. 2011); propensity (Kirby and Ibrahim, 2011); attitudes (Lena and Wong, 2003; Shinnar et al. 2008; Teixeira, 2010); and motivations (Kourilsky and Walstad, 2002). Some, however, try to measure the efficacy of entrepreneurship education (Fenton and Barry, 2011) or its impact on different countries (Lee et al. 2005). Some analyze methods (Dutta et al. 2011) and materials (Edelman et al. 2008), while others look at academic entrepreneurship (Klofsten and Jones-Evans, 2000) and faculty entrepreneurialism (Lee and Rhoads, 2004).

A particularly interesting type of testers seeks to evaluate specific entrepreneurship education programs. While some of these cases suffer from selection bias due to elective participation in programs (Fenton and Barry, 2011; Sánchez, 2011), others have devised clever ways to avoid bias (Kirby and Ibrahim, 2011; Oosterbeek et al. 2010). Lee et al. (2005) observe both elective and mandatory programs. While, in general, studies tend to find that entrepreneurial intentions are enhanced by program participation, results differ depending on whether elective or compulsory programs are being observed. In programs where participation is compulsory, participants tend to dislike the program more, which negatively affects entrepreneurial intentions (Oosterbeek et al. 2010).

Table 5 Outline of the testers surveyed			
Authors	**Year Published**	**Journal**	**Main findings**
Klofsten & Jones-Evans	2000	SBE	Examines the effects of entrepreneurial experience among academics in Ireland and Switzerland, finding that it translates into a high degree of involvement in consultancy and contract research, but not into organizational creation via technology spin-offs.
Kourilsky & Walstad	2002	IJEE	Looks at the impact of human capital and opportunity on the success of young entrepreneurs. Finds that professional experience and a technology-based idea or opportunity seem to be more important than entrepreneurship education.
Lena & Wong	2003	JEC	Finds that entrepreneurship education programs per se are not enough to promote entrepreneurial intentions and influence business start-up decisions. A positive attitude towards engagement in these programs seems important.
Lee & Rhoads	2004	RHE	Finds that teaching commitment of faculty diminishes with greater commitment to entrepreneurial activities, and also with increases in research funding.
Lee et al.	2005	IEMJ	Finds that the impact of entrepreneurship education on students' entrepreneurial intentions in Korea is much greater than in the U.S. but U.S. students have greater entrepreneurial intentions, probably because of a more entrepreneurship-oriented culture.
Edelman et al.	2008	AMLE	Finds a gap between practice and what is taught to entrepreneurship students and argues that entrepreneurship texts do not emphasize enough the activities that enhance the probability of starting a new venture.
Shinnar et al.	2008	JEB	Finds that student and faculty views on entrepreneurship often differ dramatically.
Oosterbeek et al.	2010	EER	Examines the effects of a compulsory program offered to young Dutch students. Finds that the program had significantly negative impact on entrepreneurial intentions and no impact on entrepreneurial skills.
Rodrigues et al.	2010	IJESB	Finds that (elective) entrepreneurship training has a significant influence on the propensity for new venture creation among students. Personal characteristics have an important role in shaping motivation and perceived hurdles have a negative impact on intentions.
Teixeira	2010	IHE	Finds that students who have business related competences and live in an environment that fosters entrepreneurship have a stronger desire to become entrepreneurs. Work experience and personality traits influence students' attitudes significantly.
Dutta et al.	2011	IEMJ	Finds that depth or specialization of entrepreneurship education helps facilitate the creation of new ventures. However it is breadth or diversity of educational experiences that positively influences future wealth creation.
Fenton & Barry	2011	IHE	Finds that benefits from entrepreneurship education occur mainly at the graduate level, when it is more meaningful, engaging and applied, suggesting that it should be promoted through experiential learning.
Giacomin et al.	2011	IEMJ	Finds that entrepreneurial disposition and intentions, as well as the sensitivity to each motivator and barrier, differ by country (American, Asian and European) but students across countries are motivated and/or discouraged by similar variables.
Lanero et al.	2011	IRPNM	Finds a positive effect of education on perceived entrepreneurship feasibility, which in turn positively affected entrepreneurial intentions by providing individuals with a feeling of personal competence.

Liñán et al.	2011	IEMJ	Finds that entrepreneurship education enhances perceived behavioral control, leading to greater entrepreneurial intentions. However, start-up decisions also depend on the "entrepreneurial orientation" of the individual and not only on perceived feasibility and desirability.
Kirby & Ibrahim	2011	IEMJ	Finds that entrepreneurial propensity of Egyptian students is higher than that of their counterparts in the UK.
Sánchez	2011	IEMJ	Finds that students participating in an elective entrepreneurship program increased their competencies (self-efficacy, pro-activeness, risk-taking) and intentions towards self-employment.

Builders

Builder articles are at the core of theory generation in the field. The examination of the progress of entrepreneurship education through the analysis of published material and the generation of new theoretical contributions and improvements to existing ones has been a concern shared by several authors over the last decade. Béchard and Grégoire (2005) highlight the main preoccupations in the field and develop a typology of them in entrepreneurship education. Pittaway and Cope (2007); Mars and Rios-Aguilar (2010); and Yusof and Jain (2010) develop different frameworks for entrepreneurship in higher education, based on the findings of their surveys. Laukkanen (2000); Fiet (2000b); Honig (2004); Boyle (2007); and Blenker et al. (2011) propose new approaches and models. Fiet (2000a); Shepherd (2004); and Haase and Lautenschlager (2011) propose new methods and pedagogies. Lobler (2006); Barbosa et al. (2008); Fayolle and Gailly (2008); Wollard (2010); Hjorth (2011); and Neck and Greene (2011) propose new programs and frameworks.

No qualifier articles were identified in this survey. Most builders are based on a well-defined, consistent theoretical background supporting and contextualizing the research (Béchard and Grégoire, 2005; Mars and Rios-Aguilar, 2010), while in some the theoretical background underpinning the new theory being built is not well defined but is easy to recognize (Pittaway and Cope, 2005; Yusof and Jain, 2010; Neck and Greene, 2011). A significant literature stream arises from the work by Fiet (2000a, 2000b). The more interesting contributions propose a theoretical framework and apply to a specific program, which is evaluated on the basis of the proposed framework (Laukkanen, 2000; Lobler, 2004; Barbosa et al. 2008). Table 6 summarizes the builders examined.

Table 6
Outline of the builders surveyed

Authors	Year Published	Journal	Main findings
Fiet	2000b	JBV	Appeals for educators to increase the theoretical content in their entrepreneurship courses and points several opportunities to build cumulative theory. A contingency approach for teaching entrepreneurship is proposed.
Fiet	2000a	JBV	Proposes a method to teach theory by establishing a student-approved system to enhance student motivation and participation in the acquisition of competencies.
Laukkanen	2000	ERD	Proposes a business-generating model of teaching, implying a shift of mindsets or paradigms towards the role of the university in generating business strategies.

Honig	2004	AMLE	Presents two alternative experiential models of teaching entrepreneurship: the Experiential Model of Entrepreneurship Education (using simulations and convergent group thinking), and the Contingency Model of Business Planning Education (assimilation of concepts, accommodation of divergent thinking).
Shepherd	2004	AMLE	Argues that failure is an important source of learning for entrepreneurs and proposes the application of a specific pedagogy in the classroom to teach students to manage their emotions when faced with failures.
Béchard & Grégoire	2005	AMLE	Proposes that the literature on entrepreneurship education is articulated around four major types of preoccupations: social and economic roles of entrepreneurship education; systematization of entrepreneurship education; content and methodologies; and the needs of individual students in structuring teaching interventions.
Lobler	2006	TASM	The constructivist approach and an out of school learning environment are used as a theoretical base for entrepreneurship education, deriving principles for the promotion of a self-governed learning process.
Boyle	2007	IHE	Proposes a new model of entrepreneurship education focusing on the development of the individual, more than the dissemination of knowledge. Instruments include entrepreneurial retreats for the development of entrepreneurial thinking, new curricula and individualized entrepreneurial prescriptions, apprenticeships and opportunity centers.
Pittaway & Cope	2007	ISBJ	Develops a framework for entrepreneurship education, identifying key areas for empirical research: general policy climate for entrepreneurship education; general enterprise infrastructure; and contextual factors.
Barbosa et al.	2008	JEC	Proposes an approach for the development of an educational program in entrepreneurship to help students develop their entrepreneurial cognition and risk taking, reducing the risks of failing and of missing good opportunities, and developing both the intuitive and the analytic sides of student's cognition.
Fayolle & Gailly	2008	JEIT	Proposes a framework with two levels (ontological and educational) for the development of a teaching model where five questions should be addressed: why (goals); for whom (audience); for which results (evaluation criteria); what (contents and theories); and how (methods).
Mars & Rios-Aguilar	2010	HE	A framework for strengthening the application of entrepreneurial models to higher education research is introduced, based on the theoretical constructs of entrepreneurship found in the economics and management literature, such as disruption, innovation and value creation.
Woollard	2010	HEE	Proposes a theoretical framework that sees university entrepreneurship as an organizational process within an entrepreneurial system described as an input-process-output model with feedback effects of process outputs and outcomes.
Yusof & Jain	2010	IEMJ	Proposes a framework for research into university-level entrepreneurship including entrepreneurship teaching, academic entrepreneurship, and technology transfer.
Blenker et al	2011	IHE	Identifies four paradigms of entrepreneurship teaching and proposes the emergence of a new paradigm: "everyday practice," related with the promotion of an entrepreneurial mindset. Argues that there is a logic progression between the existing paradigms and everyday practice.

Haase & Lautenschlager	2011	IEMJ	Identifies a "teachability dilemma" which emerges because while the importance of the entrepreneurial "know-how" is recognized, such know-how is also very difficult to teach because experience-based soft skills related to the entrepreneurship field are difficult to develop.
Hjorth	2011	ERD	An affect-based theory of entrepreneurial entrepreneurship education is developed in a model of provocation-based entrepreneurial entrepreneurship education (the E^3 model) which supports learning as a social creation process.
Neck & Greene	2011	JSBM	Argues that teaching entrepreneurship as a method that is teachable, learnable, but not predicted, requires practice and focus on a portfolio of techniques to practice entrepreneurship and encourage creating.

Expanders

The expander articles surveyed emphasize theories or frameworks (Fayolle et al. 2006; Kyro, 2008) or methods (DeTienne and Chandler, 2004; Graevenitz et al. 2010). All four expanders identified produce theory that is directly related to entrepreneurship education, except for Graevenitz et al. (2010), who focus on entrepreneurial intentions. All the articles compare their own theory with existing perspectives by applying it to a program and assessing its validity and consistency. Table 7 outlines the expanders.

Table 7
Outline of the expanders surveyed

Authors	Year Published	Journal	Main findings
DeTienne & Chandler	2004	AMLE	Proposes a specific training intervention model based on generativity theory (SEEC: securing, expanding, exposing, and challenging) aimed at developing opportunity identification competences in the classroom.
Fayolle et al.	2006	JEIT	Develops a framework to assess and/or improve the design and execution of entrepreneurship education programs, linking characteristics of the program (setting and audience, type of program, objectives, contents, teaching and training methods, and approaches) with outcomes related with attitudes and intentions.
Kyro	2008	IJBG	Develops a framework that combines learning and teaching for fostering individual meta-competencies (meta-affection, meta-conation and meta-cognition). These three constructs of personality and intelligence interplay and relate with the teaching and risk learning processes.
Graevenitz et al.	2010	JEBO	Proposes and tests a model of learning in which entrepreneurship education generates signals to the students. Using this model it is shown that the course induces sorting, and that entrepreneurship education may not always lead to stronger entrepreneurial intentions.

CONTENT

The testers examined make no significant theoretical contributions and in general it is not possible to detect the presence of Whetten's building blocks of theory development. An exception

is Liñán et al., (2011), who identify and relate the "what," "how" and "why" elements and explain their relationships.

In those articles classified as builders, three elements of theory development can be easily identified: "what," "how" and "why." "What" and "how" are related to the theoretical framework where concepts, constructs, variables and their relationships are described. "Why," which relates to the explanation of the theoretical assumptions (explaining the relationships and dynamics between constructs and their application to the entrepreneurship education field), is sometimes under-addressed (Shepherd, 2004; Boyle, 2007). The fourth element of theory development, which is related to testing – "who, where and when" – is usually not addressed in the builder category, although some articles may present a brief, informal, non-systematic evaluation of the programs (Laukkanen, 2000; Lobler, 2006; Barbosa et al., 2008).

The articles classified as expanders, including DeTienne and Chandler (2004); Fayolle et al., (2006); Kyro (2008); and Graevenitz et al., (2010) display consistent elements of theory-development: "what," "how," "why" and "who, where, when." When compared to builders, expanders contribute more significantly to theory since these articles assess the "what," "how" and "why" elements, analyzing temporal and contextual factors, testing the propositions of the theoretical model and thus increasing theory applicability. An analysis of theoretical contributions according to paradigms of theory-building paradigms reveals that a large majority of contributions are rooted in the functionalist and radical structuralist views. Table 8 summarizes testers, builders, and expanders according to the dominant theory-building paradigm.

Table 8
Paradigms of Theory-building

Paradigm of theory-building	Type of article	Nº of articles
Interpretivist	Builders	4
Radical Structuralist	Builders	14
Functionalist	Testers	16
Functionalist-Radical Structuralist Transition Zone	Testers	1
	Expanders	4

All testers are rooted in the functionalist paradigm, where the main goal is to test in order to predict and control, showing how the theory is refined, supported or disproved. There is, however, one tester (Liñán et al., 2011) which should be placed in the transition zone between functionalism and structuralism, due to the coexistence of testing and an aspiration to change reality and practices. These features are also displayed by all four expander articles, which are also classified in this transition zone, (DeTienne and Chandler, 2004; Fayolle et al., 2006; Kyro, 2008; Graevenitz et al., 2010).

Four articles classified as builders are founded on the interpretivist paradigm: Béchard and Grégoire (2005); Pittaway and Cope, (2007); Mars and Rios-Aguilar (2010); and Yusof and Jain (2010). In these articles, the main purpose is to describe and explain in order to diagnose and understand where new concepts and relationships emerge. All the other builders surveyed are

rooted in the radical structuralist paradigm, as their main goal is to understand, explain, criticize and act, showing how practices should change.

CONCLUSION

This aim of this paper has been to review the literature on entrepreneurship education over the last decade (2000-2011), focusing in particular on theoretical contributions. The survey shows that theoretical contributions on entrepreneurship education have been increasing and improving in terms of scope and methodology, but there still seems to be a lack of articles that expand knowledge by simultaneously making new theoretical propositions and testing those propositions in new experimental settings. Also, theory-building and theory-testing are still rooted in single paradigms, limiting the generation of more complete and eclectic knowledge.

The present work contributes to the literature by providing an overview of the current state of the field, highlighting main trends and gaps. The application of a taxonomy based on the Business and Management literature to analyze theoretical contributions in the field of entrepreneurship education is original and can provide a means for evaluation of progress in the field over time.

Contribution

Taxonomy Of Articles

Although all articles examined are deemed important for the advancement of the field, some have contributed more by going further than just describing the existing reality, by testing existing theory or developing new theories without experimentation. As Colquitt and Zapata-Phelan (2007) argue, theory-building and theory-testing can coexist in the same article, and those who succeed at both presenting a new theory and testing it are likely to make longer-lasting contributions.

More than half of the articles reviewed emphasize theory testing and/or theory development (therefore earning a classification as builders, testers or expanders), showing evidence that the appeal made by several authors (e.g. Whetten, 1989; Van de Ven, 1989; Fiet, 2000b; Rindova, 2008), for more theory has had some resonance in the field. Evolution over the last few years shows that reporter articles (including descriptive case studies) have not increased significantly in number, while testers and builders have. This finding is somewhat at odds with Colquitt and Zapata-Phelan (2007) who report an increase in expanders and a decrease in testers. Since these authors focused solely on articles in the AMJ, our findings seem to show that the literature at large has not – unlike the AMJ – emphasized expanders, and still seems to be more focused on testing existing theories or presenting new theoretical contributions without testing them.

In general, the field of entrepreneurship education does not seem to have evolved as much as would be expected over the 25 years since Ronstadt's (1985:49) diagnosis: "(…) The field is new; it is hard to defend; it has little conceptual substance because it is so young; anyone can kill a new idea." And, perhaps because entrepreneurship education is still an evolving field (Chandler and Lyon, 2001; Busenitz et al., 2003) where paradigms are still lacking, this survey finds that: (i) there is a strong focus on the analysis of the "current state" of entrepreneurship education; (ii) most builder and expander articles are centered on the development of methods, programs and new

theories or frameworks; and (iii) most tester articles are related to theories focusing on subjects other than entrepreneurship education, such as entrepreneurial intentions. One expects that, when the field is more consolidated and institutionalized, there will be a shift in the focus of the theory towards a greater refinement and a clearer emphasis on concepts and processes directly associated with entrepreneurship education.

Theory-building from case studies does not seem to be a common trend, even though this is an appropriate method for early stages of research in a field (Eisenhardt, 1989), like entrepreneurship education. None of the many articles surveyed that report case studies link results from a specific context with literature about other contexts, which compromises their conceptual elevation and generalization of data. Theory-building in entrepreneurship education is, therefore, founded on observations that go beyond specific cases.

Content

This makes theoretical frameworks especially important, as they need to contextualize the domain or subject of theory (Whetten's "what" and "how"). Assessment of articles classified as builders and expanders is positive from this point of view, as most articles do have a consistent, well defined framework. In the tester articles surveyed, a poor or inexistent theoretical framework usually means that the interpretation of patterns or discrepancies with reference to the theory being tested is also poor.

Theory generation in the field of entrepreneurship education is a concern shared by journals focusing on business and management and on education. In the particular case of management journals, the expansion of theory development is in line with Colquitt and Zapata-Phelan's (2007) prediction that theory-building would increase in management literature as the field became more mature. Where the substance of theoretical contributions is concerned, expander articles have the greatest potential to be influential with both academics and practitioners, and it can be argued that there is a shortage of such articles in recent literature. Whetten's four building blocks of theory development are better addressed in the four expander articles identified. By testing their theoretical propositions in real contexts, expanders can better address the key questions postulated by Bergh (2003): (i) in what way does the contribution revise or extend theory development? (ii) is the contribution going to be useful? (iii) will it change the way of thinking about the phenomenon?

A critical issue for the generation of more expander articles is the development of experimental evidence (Whetten's "who, where, when"). This survey supports Colquitt and Zapata-Phelan's (2007) findings that most articles developing new theory do not test their theoretical propositions in experimental settings. Theory applicability is therefore severely limited. Honig (2004) argues that entrepreneurship education seems to be "atheoretical" in the sense that empirical evidence supporting its theories and models is missing. While several authors call for more empirical testing of their own theories or approaches, they do not address this concern themselves. The present article argues that future work should focus on producing more tester articles, following three steps: (i) analyze the existing reality and identify gaps in recognized practice which can be addressed in a general manner; (ii) address these gaps by operationalizing theoretical propositions that can be applied generally; and (iii) implement and test the theoretical prescriptions in an experimental setting that can provide an accurate impression of the applicability of the theory developed. To illustrate these three steps, an example is provided. The lack of uniformity in the programs offered is mentioned by Gorman at al. (1997) as a gap that should be

addressed in future research. Based on the analysis and evaluation of different entrepreneurship education programs, theoretical propositions should be developed regarding the best strategies and practices to implement in the classroom. These strategies and practices should be implemented in the classroom and its impact further evaluated, and a follow-up should be made in order to assess the effectiveness of these measures.

With regard to the empirical testing of theoretical propositions, improvements can be observed when comparing the articles being surveyed here with those that are included in the 10-year literature review by Gorman et al., (1997). In particular, selection bias is more regularly addressed now, as some entrepreneurship education programs have become mandatory, and research has been conducted in those contexts. However, as pointed out above, the mandatory nature of entrepreneurship education can lead to unexpected results (such as a decrease in entrepreneurial intentions), as subjects develop more realistic expectations, becoming more aware that they are not well-suited for entrepreneurial activities. Still, this should not be seen as a negative effect of entrepreneurship education.

Paradigms

Notwithstanding the appeal made by Gioia and Pitre (1990) for a metaparadigm perspective in theory development, most articles concerned with theory in the field of entrepreneurship education remain based on a single paradigm. Almost all tester articles are firmly based on a functionalist paradigm, while builders are founded on the radical structuralist paradigm. Expander articles have a greater potential to straddle these two paradigms, adopting what may be called a multiparadigm, or transition approach, integrating elements of functionalism and radical structuralism. The lack of a true multidisciplinary, metaparadigm perspective restricts a more eclectic, comprehensive analysis of entrepreneurship education. At this stage of development of the field there is still a strong desire to test and change reality, proposing new practices, rather than changing ideologies and criticizing existing structures.

To summarize, it is possible to find logical patterns linking the contents and paradigms underpinning most articles, Expander articles typically, address all four questions posed by Whetten and are rooted in a multiparadigm, transition approach that integrates functionalism and radical structuralism by proposing changes to the accepted body of knowledge and testing these changes in an experimental setting. Builder articles are more limited in the sense that they address only three of Whetten's questions ("what," "why," and "how"), being rooted in the radical structuralist paradigm by proposing changes to the existing knowledge but not testing these changes. Most tester articles address only the "what" question, as they are founded on the functionalist paradigm by developing constructs and variables to test existing knowledge in new settings.

This survey suggests that the literature on entrepreneurship education is focused on what works in the classroom and what tools and models can be used to increase the quality of what can be delivered. As such, it is important to analyze the contribution of entrepreneurship education research towards classroom practices. There is not a consistent body of knowledge or a common framework in entrepreneurship education, which limits the recommendations of best practices for entrepreneurship educators to adopt. Most articles present specific cases/programs with best practices that work in a specific context, but provide no evidence that these practices may be extended towards a universal approach. Indeed, there is no unequivocal, generalizable evidence on successful practices that might be applied in a widespread variety of contexts. Pedagogical

approaches and methods are still, to a large extent, dependent on the objectives, setting, and audience. The best approach for practitioners is to examine the literature and pick out proven strategies and best practices that apply to their specific case. While the adoption of consensual guidelines in entrepreneurship education will probably remain a challenge over the next decade, there are important conclusions to be drawn. Table 9 summarizes the main insights identified in the literature.

Table 8
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Paradigm of theory-building	Type of article	Nº of articles
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Functionalist-Radical Structuralist Transition Zone	Testers	1
	Expanders	4

Limitations

This survey is not exempt from limitations. The methodological choices for the search led to a process of selection that might have left out some important contributions to the field of entrepreneurship education. While the coding scheme and categories of analysis chosen fit the purposes of the analysis, important issues may have been left behind. The deliberate choice to concentrate on a period covering roughly the last decade before 2012 means that some recent contributions may have escaped the analysis. It is believed, however, that the articles surveyed provide an accurate overview of the development of research in the field, its main gaps and achievements.

Implications For Further Research

In spite of these limitations there are also important opportunities for future research. Table 10 summarizes the main gaps identified, highlights their consequences, and proposes solutions for addressing those gaps, in order to increase the consistency of the body of knowledge. Based on previous analysis and discussion, several lines of inquiry emerge:

1. To use case studies to build theory; to link case study results with the literature on other contexts (avoiding focusing on context-specific experiences, increasing the generalization of results).
2. To undertake empirical studies testing existing theories and methodologies, and include experimental evidence in all theories or methodologies proposed.
3. To develop a metaparadigm approach to theory-building, involving researchers from different fields.

Table 10
Gaps, Problems, and Opportunities for Future Research

Gaps found	What if those gaps are not filled?	Future challenges or avenues for research
Poor theoretical frameworks.	Limited interpretation of patterns or discrepancies.	To characterize better the frameworks of the studies, defining concepts and their relationships.
Absence of theory-building from case studies; most case studies do not link their findings with other literature.	Fewer insights for the field; conceptual elevation and generalization of data will be conditioned.	To use case studies to build theory following Eisenhardt's (1989) stages; link the results of case studies with the literature on other contexts.
Sample selection bias.	Biased results and problems in the generalization of results.	To focus on compulsory entrepreneurship courses, or on purposeful samples.
Lack of experimental evidence on theories/methodologies proposed.	Theories and methodologies lacking practical validity.	To develop more experimental evidence confronting the new theories proposed and those that already exist in order to assess their validity.
The lack of longitudinal studies that derive causal attributions.	The analysis of causal attributions as modifications of behaviors or other changes occur is not possible.	To conduct longitudinal studies in the field of intentions, intentions-behaviors, and changes on both of them.
The lack of a metaparadigm perspective.	A reductionist vision of reality, instead of an eclectic and comprehensive one.	To analyze the same phenomenon under different paradigms, involving researchers from different fields.
Reduced uniformity in the programs offered.	Lack of consistency in the practice of entrepreneurship education.	Instead of creating whole new programs, use previous and already developed programs and build upon them, testing the effects of incremental changes.

The booming pursuit of entrepreneurship education over the last few decades has attracted a growing interest in entrepreneurship education research, leading to an increasingly rich field of study, although characterized by some inconsistency of the body of knowledge, which is reflected in the quality of theoretical contributions, and in the consistency of guidelines to adopt in the entrepreneurial classroom.

It is possible to conclude that theoretical contributions to entrepreneurship education have been increasing and improving, especially thanks to publication of greater numbers of tester and builder articles. New, different ideas have emerged, been articulated, organized, and connected, suggesting new directions for researchers (Rindova, 2008). However, there is still considerable scope for improvement, in particular through the development of more expander articles that make new theoretical propositions and test them propositions in new experimental settings. Theory-building and theory- testing are still rooted in single paradigms, limiting the generation of more complete, eclectic knowledge.

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INDIVIDUAL LEVEL ASSESSMENT IN ENTREPRENEURSHIP EDUCATION: AN INVESTIGATION OF THEORIES AND TECHNIQUES.

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ABSTRACT

This paper examines a number of commonly used theories and constructs applied to the investigation of the entrepreneur (at the individual level). For each of these theories, an existing measure is selected and assessed on its applicability to the study of entrepreneurship education, reflecting on past research and an empirical investigation in the entrepreneurship education context.

Focusing on trait theory, self-efficacy, intentionality and passion, a measure for each construct was investigated by administering it on a sample of students (n=367) taking an entrepreneurship education module. Aspects of the reliability, validity, internal consistency and factor structure of each test were examined using SPSS and MPlus statistical analyses. The findings allow for a direct comparison to be made of the measures in a controlled environment.

Theoretically there is a justification for applying each assessment approach to entrepreneurship education. Based on past research it was noted that trait theory has often been criticised for inconsistent empirical findings. This was echoed in our study as empirical analysis supported the use of the entrepreneurial intentionality and entrepreneurial self-efficacy measures, yet the trait measure, the General Enterprise Tendency (GET) test displayed worrisome reliability and structural validities and would not be recommended for future research without significant revision. The measure used to examine entrepreneurial passion was stable in the context, and furthermore suggested that this construct may offer valuable insight about the mind-set of students undertaking entrepreneurship education in future.

Limitations of the study include use of a mainly homogenous sample with no control group. The measures for analysis were selected as they were intended for entrepreneurship research and have since been applied to entrepreneurship education. The measures are not reflective of respective theory as a whole. Different and many theories could have been selected, as well as alternative measurement instruments. The measures could have been integrated together into a more complex analysis; however the intended purpose was to examine them in parallel.

There have been repeated calls to systematise the assessment of entrepreneurship education, to converge existing knowledge and research. It is hoped that this paper provides educators with an overview and empirical insight regarding theories and measures to adopt for future research and assessment approaches.

INTRODUCTION

> *'Long-term sustainable funding for entrepreneurship education and enterprise initiatives will be contingent on the perceived effectiveness of the entrepreneurship education. Evaluating the effectiveness of entrepreneurship education is not a facile exercise of measuring inputs and outputs; consequently, there is a lack of empirically rigorous research to substantiate HEI's claims that their graduates benefit significantly from entrepreneurship education'* (O'Connor, Fenton, & Barry, 2012, p. 248)

In an attempt to support new venture creation and innovation at all levels of industry, entrepreneurship education has been incorporated into many levels of education and significant investment has been devoted to its development (Jones, 2010; Fayolle, Gailly & Lassas-Clerc, 2006; Kuratko, 2005; Flewellen, 1977). Emerging in US business schools during the 1970's, the training for and of entrepreneurship has spread exponentially and internationally ever since (Carey & Matlay, 2011; Kuratko 2007; Fiet, 2000; Solomon, Weaver & Fernald, 1994). The link between entrepreneurship education and new venture creation has been witnessed many times (Matlay, 2006a; Shane, 2004; McMullan, Chrisman & Vesper, 2002; Varela & Jiminez, 2001) yet in order to sustain engagement by Higher Education in its development, this needs to be proven definitively and repeatedly by accepted means (O'Conner et al., 2012). With multiple theories and perspectives on the classification of the entrepreneur, and consequently the enterprising student, assessment instruments are varied which impedes their impact and convergence (Duval-Couetil, Reed-Rhoads, & Haghighi, 2010; Souitaris, Zerbinati, & Allaham, 2007). In the field of leadership for example, the big 5 personality trait model, or five factor model, has been used extensively by researchers giving it legitimacy and widespread approval. In the entrepreneurship field, however, it is apparent that in many cases researchers tend to devise new measurement frameworks and instruments for each empirical study conducted, rather than selecting the most valid from prior work, which would help to consolidate findings (Shook, Priem, & McGee, 2003).

This paper discusses some of the key theories that are employed to assess the outcomes of entrepreneurship and entrepreneurship education from the perspective of an individual or an individual student. From this, a selection of instruments are chosen and used in parallel on a student sample to examine and compare their reliability and validity in context, the aim of which is to make inferences about their applicability for future research in entrepreneurship education.

Entrepreneurship Education at a glance

Entrepreneurship education has been defined by many scholars, yet disagreement still remains about its explicit meaning. For decades, research has tried to separate entrepreneurship education from enterprise education (Henry, Hill, & Leitch, 2005; Gibb, 2002; Garavan & O'Cinneide, 1994) and while this disentanglement may be beneficial, it lies outside the scope of this research paper. Taking a general sense, entrepreneurship education is defined by Heinonen et al. (2006, p. 81) as 'activities aimed at developing enterprising or entrepreneurial people and

increasing their understanding and knowledge about enterprise and entrepreneurship'. Though this definition establishes the main purpose of entrepreneurship education, many researchers believe that its impact is wider, affecting the skill-set and knowledge beyond that of entrepreneurship itself (Lewis & Massey, 2003; Hynes, 1996). Fayolle et al.(2006, p. 702) incorporate these ideals by defining an entrepreneurship education programme, or EEP as 'any pedagogical process that develops entrepreneurial attitudes and skills as well as personal qualities'. The combination of these specific enterprise skills and more generalised qualities is hoped to give students a more holistic educational experience, which would integrate to develop the students' enterprising mind-set.

There is a research consensus that enterprise and entrepreneurship education are valuable additions to many business courses, and indeed non-business disciplines (Bosma & Levie, 2010; Rae, 2010; Hynes, 1996). Benefits include helping to integrate various business subjects and topics; promoting cooperation and the transfer of knowledge between educational institutes and wider business, and allowing for improved decision making in students (Faoite et al., 2003). Yet similar to the definitional ambiguity, there has been much disagreement about other aspects of entrepreneurship education, including the pedagogy (Hytti & O'Gorman, 2004) and assessment of an entrepreneurship education programme or course (Carey & Matlay, 2011; Jones, 2010; Matlay, 2005). As progression in any research field must be built on a cyclical process of reflection and action, these issues have slowed the development of the field. If educators cannot receive comprehensive feedback about an EEP and its effectiveness, the pedagogy cannot be improved upon, and also the benefits of a programme cannot be seen or celebrated (O'Connor et al., 2012). Despite consistent calls, there is no widely accepted measurement instrument or approach to discern entrepreneurial students or individuals from a sample group (Pittaway & Edwards, 2012; Peterman, 2003). Similarly, there is no definitive method of assessing an entrepreneurship education course or programme that is accepted and used by a majority (Potter, 2008). This research investigation seeks to explore a selection of assessment measures taken from different theoretical standpoints, to ascertain which methods already proposed in the area are effective in the theoretical and the practical sense.

Duvail-Couetil et al., (2010) note that there are three main assessment levels when researching entrepreneurship education; (a) course-level assessments where the course itself is under scrutiny for its effectiveness, or the effectiveness of pedagogical intervention (Wilson, Lizzio, & Ramsden, 2012), (b) individual-level assessments whereby a specific instrument is used to measure a construct perceived to be related to entrepreneurship; and (c) top-level evaluations of programmes in which the impact in economic or knowledge terms can be analysed. This study is localised to that of the individual level assessment measures only.

Finding the Entrepreneur

In most educational contexts, the practices and theories incorporated in the teaching of a subject at third level disseminate from discoveries and research advances made in its respective field. Management, human resources, and strategy all follow this practice, and entrepreneurship is no different. The methods used to evaluate entrepreneurship and assess individual

entrepreneurs have been adopted into entrepreneurship education, for better or for worse. Researchers have tried to classify the entrepreneur using a wide array of theoretical perspectives including trait, cognitive, attitude, intentionality and outcome based methods (economic or performance) (Heinrichs & Walter, 2013; Rae, 2010; Shane & Venkataraman, 2000). Yet the findings from this body of research remain fragmented and dispersed (Shook et al., 2003; Gartner, 1989). Some of these approaches will be discussed in brief below, considering the contributions made to the field and their applicability to the assessment of entrepreneurship education. These include measures used to evaluate entrepreneurship which are outcome or performance based (assessing whether the person started a new venture) or based on behavioural, attitudinal or psychometric measures.

Performance

Performance is a construct that is as popular as it is varied. It can be distinguished into two main types; firstly as a behaviour or action (i.e *performing*) and secondly as an output (Beal et al., 2003). In entrepreneurship research, the focus is output, and its measurement mainly concentrates on addressing whether an individual creates a venture following an entrepreneurial intervention of some sort (Peterman & Kennedy, 2003) or if he/she improves an existing venture through innovative action. The approach is often used to evaluate entrepreneurship education programmes or courses, using individual-level performance measures such as innovative *output* i.e. the number or quality of innovative ideas produced, new ventures created, or student grades (Fayolle et al., 2006). Other performance indicators in education involve assessing knowledge (exam or assignment); evaluation of course and student satisfaction (via surveys) (Shartrand & Weilerstein, 2008). Fayolle et al. (2006) notes the possible short-sightedness of limiting the focus to new venture creation and output only, calling for researchers to be more holistic in their assessment of an entrepreneurship education programme (EEP). Highlighting this point, Kostoglou & Siakas (2008) surveyed 197 graduates in Greece finding that students who attained lower performance results were more involved in entrepreneurship than those who excelled by traditional academic assessment.

Trait theory

The trait approach assumes that the entrepreneur has a unique personality with discernible psychological characteristics, and if a method of locating these characteristics were to be developed, researchers would be able to locate entrepreneurs in a sample (Driessen & Zwart, 1999; Scherer et al., 1989; Low & McMillan, 1988; McClelland, 1961). This view takes into account the entrepreneur, the enterprising individual and the intrepreneur, considering them to have similar psychological profiles but perhaps different intentionality or environmental factors (Antoncic & Hisrich, 2003; Cromie, 2000). It is considered that while enterprising individuals are not all entrepreneurs, all entrepreneurs must display enterprising qualities (Cromie & Callaghan, 1997; Caird, 1990a). In particular, need for achievement and risk-taking are two traits commonly associated with entrepreneurs that have been tested for on many occasions. Need for

achievement (nACH) was first applied to entrepreneurs by McClelland (1961) and refers to the motivation felt by an individual to accomplish a task to a certain standard of excellence. It has been suggested that successful entrepreneurs display a higher need for achievement than other occupational groups (Hansmark, 2003; Begley & Boyd, 1987; Morris & Fargher, 1974). This was shown in particular by Collins et al. (2004) in their extensive meta-analysis of 41 studies who found a link between nACH and choice of entrepreneurial career and performance. Another popular trait associated with the entrepreneur, risk taking, describes a person who works at his/her own risk to make a profit based on market demands (Landstrom & Benner, 2010; Long, 1983). It has become a well-researched trait (Galor & Michalopoulos, 2012; Praag & Versloot, 2007), displaying a positive relationship with the characteristics of the entrepreneur (Gürol & Atsan, 2006; Venuvinod, 2005; Sexton & Bowman, 1980; Schwer & Yucelt, 1984).

While the two examples described above have gained a certain amount of legitimacy from their repeated use and findings, trait theory itself has been subject to much criticism. It is commonly criticised due to claims of simplicity, rigidness and the presence of many studies displaying inconsistent findings based on weak empirical analysis (Collins, 2004; Chell, Haworth & Brearley, 1991; Robinson et al., 1991; Gartner, 1989). Gartner (1989, p. 57) suggested that the entrepreneur, as a result of trait theory, is known to have so many varying characteristics, and so 'full of contradictions' that he or she is not discernible. Davidsson and Wiklund (2001) consider it 'naive' to base research conclusions on the findings of trait based research in isolation, and recommend the trait approach as part of more multi-layer approaches. More recently, however, there has been a renewed interest in the measurement of trait theory where stronger research methodologies are employed and a distinction is made between specific and general traits (Sanchez, 2013; Caliendo & Kritikos, 2012). Within entrepreneurship education itself, trait theory has been used successfully to distinguish students wishing to pursue entrepreneurship from those were less inclined (Gürol & Atsan, 2006; Caird, 1991a).

Entrepreneurial Intentions

It is thought that in some circumstances, individuals with a certain 'entrepreneurial disposition' who have not yet created a new venture may be lacking in intentionality to begin (Thompson, 2009). Entrepreneurial intentionality or the 'state of mind that directs and guides the actions of the entrepreneur toward the development and implementation of the business concept' (Boyd & Vozikis, 1994, p. 64) has been recognised as a key construct in predicting future entrepreneurial activity (Krueger, Reilly, & Carsrud, 2000). Intention-based models are seen to be strong predictors of planned behaviour and are commonly based on Azjen's theory of planned behaviour which dictates that attitudes predict intentions, which in turn aid in predicting subsequent behaviour (Azjen and Fishbein, 1980). Within the field of entrepreneurship, two intention based models are used commonly, one based on Azjens theory of planned behaviour and the other known as the Shapero entrepreneurial event (SEE) model, with Krueger et al (2000) finding both models to be robust in their comparison. Foyolle et al (2006) has previously recommended the use of Azjen's model in the assessment of entrepreneurship education.

A study by Le Poutre et al. (2010) testing the entrepreneurial intention of secondary school students over 21 entrepreneurship programmes found positive results linking the student experience to entrepreneurial intentions. In other studies, Peterman and Kennedy (2003) and Souitaris et al. (2007) both found strong significant positive results between entrepreneurship education and intentions toward venture creation, while Osterbeek et al. (2010) found the contrary to be true. Like many other entrepreneurial constructs, entrepreneurial intentionality has been weakened by ambiguity in its definition and measurement (Thompson, 2009), however its use in entrepreneurship education is thought to be particularly suited on to student sample groups who have not yet delved into entrepreneurship but may intend to (Krueger et al., 2000).

Entrepreneurial Self- Efficacy

Self-efficacy as defined by Bandura (1977, p. 240) as 'a judgement of one's ability to execute a particular behaviour pattern'. It is suggested that a person's self-efficacy will determine their level of intended effort, persistence and engagement with a project. Embedded in social cognitive theory, all efficacy constructs are future-orientated perceptions about one's ability to execute a specific course of action in order to produce a given achievement in a certain setting or context (Goddart, Hoy and Hoy, 2004). Bandura (1986) postulated four main sources of self-efficacy; mastery experience, vicarious experience, social persuasion, and psychological/emotional states.

Self-efficacy has been highlighted as a key construct relating to entrepreneurs and the field of entrepreneurship (Henry, Hill, & Leitch, 2005). It is considered to be particularly useful in entrepreneurship education due to its malleability as a construct, likely to be advanced through training and education (Zhao, Seibert, & Hills, 2005). The fact that Bandura (2006) explains that self-efficacy must be tailored to a specific context and domain of functioning ties in with authors such as Robinson et al. (1991) who recommends that scales designed for entrepreneurship education should have some situational specificity within them. Following this premise, the concept of entrepreneurial self-efficacy (ESE) has been used by many researchers in the field of entrepreneurship education (Maritz & Brown, 2013; Zhao et al., 2005). As a contextualised version of the self-efficacy construct, entrepreneurial self-efficacy (ESE) is oriented around an individual's belief about their capability to attain success and control cognition in order to manage challenging goals during new venture creation (Maritz & Brown, 2013; Drnovšek, Wincent, & Cardon, 2010).

ESE, like self-efficacy is grounded in the socio-cognitive approach as it considers the individual and the environment; considering how the context around the individual affects his/her cognitive and affective reasoning when undertaking entrepreneurship (Drnovšek, Wincent, & Cardon, 2010). It has been linked to entrepreneurial intentions on many occasions (Sánchez, 2013; Fayolle et al., 2006) and also to the likelihood of new venture creation (Rauch & Frese, 2007). Entrepreneurship education has been empirically seen to raise levels of ESE, indicating its usefulness in this field (Wilson, Kickul, & Marlino, 2007) and has been recommended as a key factor to consider in the creation of entrepreneurship education pedagogies and curricula (Pihie & Bagheri, 2010). Maritz and Brown (2013) recently found that

students undertaking an entrepreneurship education programme increased their ESE, in particular for females aged 40+ and without business-owning relatives. It seems that by engaging in an entrepreneurship education programme these individuals access experiences such as mastery experience (through projects etc.) and social persuasion (via role models) that they did not have access to organically.

Entrepreneurial Passion

It has been pointed out in recent research that those involved in entrepreneurship have high levels of passion (Murnieks, Mosakowski & Cardon, 2012; Cardon et al., 2009). Entrepreneurial passion is the joy that a person obtains from engaging in specific activities that come with the job of being an entrepreneur (Cardon et al., 2009). Authors such as Smilor (1997) previously noted that the prevalence of entrepreneurial passion in entrepreneurship literature was more rhetoric than explicit or empirical, it is now a construct that is growing in popularity of late especially in quantitative studies. Entrepreneurial passion is typified by an intense positive emotion associated to venture related activities which increases entrepreneurial resilience (Cardon et al., 2009). Entrepreneurial research has investigated the impact of passion on new venture growth in the past (Baum & Locke, 2004) and it has also been studied in line with many constructs associated with entrepreneurship. Recent work by Cardon and Kirk (2013) found that entrepreneurial passion mediated the relationship between entrepreneurial self-efficacy and persistence. It is not yet clear whether entrepreneurial passion will glean significant results in the entrepreneurship education field. In their study involving young students, De Clercq et al. (2012) preferred to use a more general construct for passion rather than entrepreneurial passion believing students at that age will not be sufficiently aware of entrepreneurship to be passionate about it.

METHOD

Sample

Students taking an entrepreneurship module in Dublin City University were selected for the purposes of this study. The students were from a first year undergraduate and postgraduate business programme taking a shared entrepreneurship module. The group were asked to complete an online survey in September 2012 and the results were collected in late December. The respondents numbered 366, which consisted of 245 (66.9%) first year students and 121 (33.1%) and postgraduate students. In addition the large majority (81.6%) were Irish. The questionnaire contained demographic variables and measures relating to trait theory, self-efficacy theory and intentionality which are outlined below. In September 2013, a similar survey was released to the subsequent group taking the entrepreneurship education module. From the second study we will be examining a measure not previously included, that of entrepreneurial passion. This omission in the original study will limit the comparability of entrepreneurial passion from the other constructs but not overly so, as the two test groups are thought to be

similar in terms of context. In the second study, the number of responses attained was 257. This sample was similar to the earlier version, consisting of both first year students (67.7%) and postgraduate students (31.9%) studying a shared entrepreneurship module. Over 91% of the students were aged between 17 and 25 and were evenly split gender-wise with 127 males to 130 females. Both survey results were analysed using SPSS and Mplus to determine their validity and factor structure.

Measures

The criteria for the selection of measures for the purposes of this study, was to select instruments that have been used multiple times in entrepreneurship with limited knowledge about its validity and applicability in the entrepreneurship education context.

1. **Entrepreneurial Self Efficacy:** Most measures of ESE follow the same general format items and are designed around aspects typically associated with starting a new business such as opportunity recognition, managerial skills and tolerance, which are measured using a Likert scale (Maritz & Brown, 2013; Barbosa, Gerhardt, & Kickul, 2007). There are many forms of the ESE construct employed in empirical studies, an issue that limits its comparability and reliability (Maritz & Brown, 2013). It has been observed as a multi-dimensional and a uni-dimensional construct (Peterson, Mueller, & Sequeira, 2009; Zhao et al., 2005; Chen, Greene, & Crick, 1998). Though found to have validity as both, there are concerns that treating ESE as a composite or unified measure may limit its investigative value (Maritz & Brown, 2013; Drnovšek et al., 2010; McGee et al., 2009). Despite this, the measure chosen for this study was a unified construct devised by Zhao et al. (2005). The measure was found to display discriminant validity with Chen et al. (1998)'s general self-efficacy construct, yet was positively related to entrepreneurial intentions, indicating its convergent validity.

2. **Entrepreneurial traits:** The general enterprise tendency test or GET test is a 54 item questionnaire made up of 5 dimensions of personality. The measure considers that enterprising individuals have certain discernible traits which are typified by (a) a motivation to accomplish a task to a standard of excellence (*Need for Achievement*), (b) the tendency to speak and act devoid of concern for consequence or authority (*Need for Autonomy*), (c) a perception that the individual has control over their own life (*Locus of Control*), (d) an ability to take calculated risks in the pursuit of success (*Calculated Risk Taking*) and lastly, (e) the tendency to be imaginative, innovative, curious and versatile (*Creative Tendency*) (Caird, 1990, 1991; Durham University Business School, 1988). Since the GET tests inception it has demonstrated criterion and predictive validity across various sample groups and countries (Cromie & O'Donoghue, 1992; Salleh HJ. Din, 1992) and was deemed by Cromie (2000, p. 22) to be*' a comprehensive, accessible, easy to administer and score, and, though additional work is needed to verify its psychometric properties, some studies have found that the GET test has criterion and convergent*

validity and good internal consistency'. Despite this, concerns have been expressed about the internal consistency of the test's constructs (Stormer, Kline, & Goldenberg, 1999) a problem that is commonly noted in early trait research (Collins et al., 2004)

The test was selected for the purposes of this study as the traits included are discussed commonly in trait research and also its use in previous entrepreneurship education assessments. The works of Caird (1991), Kirby (2004) Cromie (2000) and Cromie and O'Donoghue (1992) suggest that students are the least enterprising group when matched with other occupational groups such as managers and teachers. Studying students exclusively, Kirby and Honeywood (2007) found students with ADHD had higher GET scores than the norm, and subsequently Kirby and Ibrahim (2010) found that Egyptian undergraduate students had higher GET results than their British peers. Salleh (1992) found that there was a positive relationship between GET scores and 'number of previous employments' for students in a large Malaysian study. From these past works, it is clear that educational researchers are interested in the GET test as a measure of entrepreneurial tendency in students

3. **Entrepreneurial Passion:** The measure used for entrepreneurial passion was derived from a scale for harmonious passion by Vallerand et al. (2003) which was adapted for entrepreneurship by Murnieks et al. (2012). This scale is a 6 item Likert scale which includes items such as 'For me, being an entrepreneur is a passion'. One of the items was removed as it was believed to be too closely associated to entrepreneurial intentionality namely 'my intention is to become an entrepreneur'.

4. **Entrepreneurial Intentionality:** The measure for entrepreneurial intentions was taken from the larger Entrepreneurial Intention Questionnaire (EIQ) by Linan and Chen (2009). It is a six-item scale with a 7 point Likert scale consisting of agreement questions such as 'I am determined to create a firm in the future'. Past work indicates that this measure is applicable for student samples. Using four of the six items, Iakovleva et al. (2011) sampled a total of 2,225 students representing 13 countries to measure their intention to start a new venture. Interestingly, their results found that students in developing countries had greater intentionality scores than students in developed countries.

RESULTS

Reliability

1. **Entrepreneurial Self-Efficacy Test:** Alpha reliability for the ESE scale was found to be 0.800 which is considered acceptable, with a mean inter-item correlation of 0.500. Netemeyer et al. (Netemeyer, Bearden, & Sharma, 2003) recommends item-total correlations ranging from 0.50 to 0.80. The ESE test meets these criteria as all correlations are above 0.578. The findings suggest that the items are reliable in forming the scale.

2. **General Enterprise Tendency Test*:*** In terms of the internal consistency or the degree to which the scale items measure the same feature, the overall GET test has a Kuder-Richardson score of 0.774 with a mean inter-item correlation of 0.061. For a dichotomous scale such as the GET test, the Kuder-Richardson formula 20 (KR20) is more appropriate even though it provides much the same result as the usual Chronbach Alpha test (Kuder & Richardson, 1937). This is considered acceptable to many researchers but as both the Cronbach alpha and KR 20 values are calculated according to the number of items in a scale it may not be precise (Cortina, 1993). In fact, as the GET test is a 54 item scale it would need to attain a KR 20/C.A. value of 0.96 in order to attain base item-total correlations of 0.3. In its current form, it is also observed that 39 of the scale items obtained item-total correlations which are under 0.3 and would ordinarily be removed. Taking each of the sub-scales in isolation each receive poor results in terms of internal consistency (See Table 1) and would not be deemed acceptable.

Table 1. Inter-correlations and Cronbach Alpha values for the GET test

	No of items	Mean inter-item correlations	Cronbach Alpha
1. Need for Achievement	12	0.091	0.546
2. Need for Autonomy	6	0.06	0.276
3. Locus of Control	12	0.073	0.476
4. Calculated Risk Taking	12	0.107	0.577
5. Creative Tendency	12	0.085	0.509

3. **Entrepreneurial Passion:** Using the second study results the reliability was assessed for entrepreneurial passion (5 items). Alpha reliability for the scale was found to be 0.873 which is considered acceptable, with a mean inter-item correlation of 0.582.

4. **Entrepreneurial Intentionality:** Alpha reliability for the 6 item scale was found to be very strongly reliable at 0.955, with a mean inter-item correlation of 0.778. All inter-item correlations were above 0.719 suggesting that the items were very reliable in forming the scale. There did appear to be some minor inconsistencies in the results obtained for the first item in the measure, believed to be due in part to a formatting issue with the questionnaire which was rectified shortly after the survey was disseminated. Despite this minor issue, the intentionality scale was deemed to be strongly acceptable.

Convergent, discriminant and criterion validity

The three scales in the first study were compared using Pearson product-moment correlation coefficients in SPSS. All relationships between scales were positive and significant, indicating convergence between the constructs yet not overly so, which would indicate they are measuring the same construct. The trait based GET test indicated a mid-strength and significant relationship with the entrepreneurial self-efficacy (ESE) measure, r=0.329, n= 364, p< .0005, and also with the intentionality (EI) measure, r=0.379, n=317, p< .0005. Entrepreneurial passion was not compared in this analysis.

Table 2. Measure correlations

	General Enterprise Tendency	Entrepreneurial Intentionality	Entrepreneurship Self-Efficacy
General Enterprise Tendency	1		
Entrepreneurial Intentionality	.379**	1	
Entrepreneurial Self-Efficacy	.329**	.453**	1

**. Correlation is significant at the 0.01 level (2-tailed).

To investigate the criterion related validity of the measures an independent samples t-test was conducted to compare scores for each of the constructs against a gender variable. It has been noted in the past that males tend to score higher on entrepreneurship measures than females (Lena & Wong, 2003), and this was expected to be reflected in each of our considered scales also. The GET test produced no significant results while the other two constructs did find significant differences between males and females. Entrepreneurial self-efficacy was higher in males (M=13.70, SD = 2.786) than females (M=12.73, SD = 2.586; t (364) = 3.383). The magnitude of the difference in the means between males and females was small to moderate (eta squared = 0.03). Similarly, the intentionality based measure found males (M=25.56, SD = 9.38) to have higher scores than females (M=23.07, SD = 9.937), with the magnitude of the differences between the mean scores of the two group also small to moderate (eta squared = 0.016). Using the second study, the Entrepreneurial passion scale used did not show a significant difference between males (M=18.18, SD = 3.918) and females (M= *17.88*, SD = 3.56; t (243) =0.633).

Factor Analysis

Factor analysis was carried out on the original 54 item GET test to allow the researcher understand the inter-relationships between variables. Principle component analysis revealed 22 components with eigenvalues greater than 1, accumulating to 60.28% of the total variance. A

confirmatory factor analysis was undertaken using the sub-scale constructs as a five-factor model however no convergence was found. Taking each of the sub-constructs separately (Need for Achievement, Risk Taking, Need for Autonomy, Locus of Control and Creative Tendency) most showed the presence of four components despite only containing 12 items (except need for autonomy which has 6 items and indicated a two factor construct). This indicates that even within the specific dimensions of the GET test, the items were not testing for the same concept. In addition, it was found in all analysis that there was prevalent cross-loadings and items which loaded very poorly (below 0.4). Many attempts to remove these items and retest were unsuccessful in creating any form of model fit. The most successful revision attempt reduced the scale to 26 items. Factor analysis of this revised GET test was carried out, revealing the presence of 7 components accumulating to 52.5% of the total variance, yet this was still deemed to be low and did not receive an adequate model fit using either EFA or CFA analysis in Mplus.

Using a confirmatory factor analysis, the entrepreneurial self-efficacy measure was found to be best suited to a one-factor model as was expected from previous studies (CFI = 1.000, TLI = 1.016, RMSEA = 0.000, RMSR = 0.000). The entrepreneurial intentionality measure was similarly predicted to be a one-factor model. Due to a negative cross-loading of the first item due to a minor survey issue previously outlined, it was removed for the final CFA analysis. The results indicated that indeed a one-factor model was the best fit, displaying parsimony in the thresholds investigated (CFI = 0.991, TLI = 0.982, RMSEA = 0.095, RMSR = 0.015).

As the measure of entrepreneurial passion has had limited use on student samples, it was decided to conduct an exploratory factor analysis at the outset. Results indicated that a two factor model displayed the best fit on a range of goodness-of-fit measures (CFI = 1.00, TLI= 1.026, RMSEA = 0.00, RMSR = 0.002). These results divided the scale items into two clear loadings; the first which was concerned with the attractiveness of entrepreneurship as a concept with items such as 'the new things I discover with entrepreneurship allow me to appreciate it even more'. The other factor loading contained items such as 'I am completely taken with being an entrepreneur' could be considered more career orientated. It could be speculated that a young student sample who are further from considering careers may answer these items differently, thus altering the factor structure. This two factor structure was confirmed using a CFA (CFI = 0.993, TLI = 0.984, RMSEA = 0.049, RMSR = 0.026).

Table 3. Summary of Factor Analyses[a]

Measure	Model	x^2 (df)	CFI	TLI	RMSEA	RMSR
Entrepreneurial Passion	Null	358.702(10)**				
	One factor	43.164(5)**	0.891	0.781	0.178	0.062
	Two factor	6.288(4)	0.993	0.984	0.049	0.026
Entrepreneurial Intention	Null	1647.372(10)**				
	One factor	19.397(5)	0.991	0.982	0.095	0.015
Entrepreneurial Self-efficacy	Null	291.990(6)**				
	One factor	0.447(2)	1.000	1.016	0.000	0.007
General Enterprise Tendencies	Null	90900.048(1431)**				
	One factor	88210.600(1377)**	0.029	-0.009	0.415	0.131

[a]The chi-square test is a measure of overall fit; an acceptable result occurs when the analysis fails to reject the null hypothesis i.e. when there is a non-significant result. The chi-square test is often affected by sample size and should only be used as one of many indicators of goodness of fit. The comparative fit index (CFI) investigates the amount of total variance accounted by the model tested where an figure of >0.95 is considered acceptable. The normal fit index (NFI) compares the model fit to the baseline model, seeking a result of >0.95. A root-mean -square error of approximation (RMSEA) figure of below 0.08 is also sought as well as a root-mean-square-residual (RMSR) figure of below 0.06 to indicate a close fit of the data to the model.

DISCUSSION

The aim of this research was to measure the reliability and internal consistency of four measures commonly used to investigate the entrepreneur, which were applied to the context of entrepreneurship education. The measures emanated from differing theoretical perspectives, and have been used previously by scholars in entrepreneurship. This study investigated students of an entrepreneurship education module in an Irish university, focusing on respondents' entrepreneurial tendencies, entrepreneurial intentions, entrepreneurial passion and entrepreneurial self-efficacy.

In terms of the reliability of the measures chosen, it was observed that while all measures met the current standards for internal consistency, or the degree to which the scale items measure the same feature, the results of the General Enterprise Tendency (GET) trait measure caused some concern. In assessing a scales reliability, using the Chronbach Alpha (CA) coefficient (or Kudar Richardson KR-20), the number of items in the scale must be taken into account. The GET tests results indicated that it does not meet the criteria for internal consistency, and in addition a significant number of items did not correlate well with the total, indicating that they did not relate well to a common construct. Entrepreneurial intentionality, entrepreneurial passion and entrepreneurial self-efficacy all displayed strong reliability in the study.

Three of the scales were tested together to assess convergence; entrepreneurial tendencies, entrepreneurial intentions and entrepreneurial self-efficacy. All relationships between scales were positive and significant, indicating that for each measure of entrepreneurial qualities, the others were consistent. This was expected as students displaying enterprising tendencies would have a higher efficacy for entrepreneurship and so on. Also important to note was the low to mid-strength of each of these relationships, indicating that though they are related, they are measuring differing constructs thus displaying discriminant validity of sorts. Lastly, independent t-tests were carried out with each of the measures against gender to explore whether they would discern males from females. Research has seen that males usually have higher scores in entrepreneurial tests than females (e.g. Lena and Wong, 2003; Wilson, 2007) and this was investigated in the tests. Significant differences were noted using the self-efficacy and intentionality measures as expected. The enterprise tendency measure, the GET test did not provide significant results between the genders. While the measure for entrepreneurial passion did not provide significant results between males and females, there has been little research on whether males display higher passions for entrepreneurship, thus this result may be an early indication that the rule cannot be extrapolated from other constructs to that of entrepreneurial passion.

A number of factor analyses were conducted using principle component analysis on each of the measures to investigate the inter-relationships between the variables, and to determine how many latent variables underlie each set of items. An exploratory factor analysis of the GET test revealed that as a whole, 22 factors with eigenvalues greater than one was produced which was significantly higher than anticipated. When the dimensions were examined separately, multiple latent variables were observed and the data was filled with cross-loadings and negative loadings,

indicating that the items do not coherently examine the latent variables. Entrepreneurial self-efficacy and entrepreneurial intentionality both displayed parsimony in their confirmatory factor analyses for a one-factor model. The entrepreneurial passion measure was seen to be best suited to a two-factor model, separating the items into a latent variable concerned with the attractiveness of the entrepreneurial as a concept and a more career-orientated factor. A summary of the findings of the empirical analyses are presented in Table 4 below.

Table 4. Summary findings of empirical analyses

	(a) General Enterprise Tendency test	(b) Entrepreneurial Self Efficacy	(c) Entrepreneuial Intentionality	(d) Entrepreneurial Passion
Type	Trait	Self-Efficacy	Intentionality	Passion
Source of measure used	Caird, (1991), DUBS, (1988)	Zhao et al., (2005)	Linan and Chen, (2009)	Murnieks et al., (2012)
No of items	54	5	6	7
Type	Dichotomous	Likert	Likert	Likert
Reliability	KR20 = 0.774	CA = 0.800	CA = 0.955	CA = 0.905
Convergent validity	Positive significant relationship between (b) & (c)	Positive significant relationship between (a) & (c)	Positive significant relationship between (a) & (b)	Not tested
Criterion related validity		Differentiated between males and females	Differentiated between males and females	
Factor analysis	No convergence for multiple CFA models	1 factor model	1 factor model	2 factor model

The findings of this study indicate that the measures used to test the students entrepreneurial self-efficacy and entrepreneurial intentions were successful in meeting all empirical analyses of reliability and internal structure, and are viable options for entrepreneurship education research of this nature. The measure used to examine entrepreneurial passion was also successful using these criteria, and moreover gave us an interesting insight about the passions of the students surveyed. These particular findings indicated that both males and females had similar results in terms of their passions to start a new venture, so much so that it was not a criterion that differentiated them. The measure chosen to examine enterprising tendencies, the General Enterprise Tendency test displayed worrisome results in terms of its validity and its factor structure in the context to which it was used. Though convergent with the other scales, the test did not meet the required criteria in terms of reliability, internal consistency or factor structure and would not be recommended for similar studies without significant revision. Though the constructs analysed herein are contextually based and therefore should be inspected for suitability before any large scale empirical examination, it would seem that a sample of students taking entrepreneurship education are an appropriate fit for three of the four constructs used.

CONCLUSION

As the number of graduate level jobs is reduced during the economic downturn, the onus is on entrepreneurs, government bodies and educators to contribute toward reenergizing economic activity (Rae, 2010). Institutes of higher education are asked to support the development and supply of entrepreneurial talent to the economy (Carey & Matlay, 2011; O'Connor et al., 2012). The belief is that entrepreneurship education can be used to support this aim in a cost-efficient manner (Matlay, 2006). However, the challenge is to prove that entrepreneurship education programmes work in tangible terms. If the benefit of these programmes cannot be seen definitively, then what is the point of further investment by higher education? The running of an EEP can be time and cost-intensive for educators and institutions, in attaining industry guest speakers and novel pedagogical interventions. In order for these types of courses to be sustained, stakeholders need to be certain of the advantage, necessitating that the assessment of such courses is measurable, comparable and valid (O'Connor et al., 2012). Empirical research in entrepreneurship itself has been criticised in the past due to measurement tools being limited in structure, impact and convergence (Duval-Couetil et al., 2010; Souitaris et al., 2007). This problem has also been seen in the entrepreneurship education literature (Jones & Iredale, 2010). Scholars have noted the need to consolidate findings with regard to the teaching and assessment of the subject in order to secure its maturation and must continue to pursue this.

In an attempt to explore some individual level assessments of entrepreneurship education, this research paper sought to review a number of existing and emergent theories in the field and compare some of their respective measures. It is hoped that through the research findings, academics and practitioners can select the theories that best suit their research agenda, and use existing research instruments or measures if justified.

LIMITATIONS

Selection of theories

It is acknowledged that there are many more theories and instruments employed in this area that can help the field of entrepreneurship education. In particular, behavioural theory was not emphasised, yet it is acknowledged that much knowledge can be sought by examining entrepreneurial learning behaviour and other related constructs. Much work has been spent on the behaviours common to entrepreneurs and instruments such as the *entrepreneurial behaviour inventory (EBT)* which may have useful applications in entrepreneurship education and should be investigated in the future. In addition there are many more elements of learning theory that can be investigated with instruments as the perceived learning scale by Rovai et al. (2009).

Selection of measures

The measures for analysis were selected as they were intended for entrepreneurship research and have been applied to entrepreneurship education. The measures are not reflective of

their respective theory as a whole and should not be viewed as such. In particular, the selection of the GET test to examine the personal characteristics of the enterprising student was due to its use in the entrepreneurship education literature, and the problems highlighted with the research instrument itself should not and does not discredit trait theory. This research accepts that there are other similar trait or personality measures that could have been selected such as the E-scan test (Driessen & Zwart, 1999) which could have had differing results.

Recent studies have used measures which integrate theories together in very promising ways. For example Wilson et al. (2007) examines the relationships between ESE, EI and gender in their investigation and while a notable contribution was made, the authors constructed their own measures. The point being made in this paper is that if researchers constantly devise new measurement instruments, rather than selecting the most valid from prior work, there will never be astute research consensus (Shook et al., 2003).

Mixing of constructs

Many studies have incorporated more than one type of measurement during the study of entrepreneurship finding interesting results that deepen our understanding. Linked theoretically by Boyd and Vozikis (1994) in the past, entrepreneurial self-efficacy has been found to have a strong link with intentionality (Wilson et al., 2007; Zhao, Seibert, & Hills, 2005; Krueger & Brazeal, 1994; Chen, Greene, & Crick, 1998). In addition, recent work has begun to integrate that of trait theory to both of these constructs, empirically and theoretically (Sanchez, 2013). It has been suggested that wider, multi-level studies bringing trait theory together with cognitive and environmental factors may be the way forward, rather than keeping all theories fragmented (Zhao, 2005, Low and MacMillan, 2001). Von Graevenitz et al. (2010) investigated self-efficacy, intentionality and performance in their study of entrepreneurship education students in Munich. Their investigations found that the sample group's intentionality was actually reduced. The authors were able to explain their rather interesting results by integrating their array of measurement data, and postulated that while the course had a significant positive effect on student self-efficacy and skills; it allowed them to make more informed decisions about a future career, in which many decided that entrepreneurship was not preferable for them. In this study, it was the integration of various tools and theoretical constructs that gave the researcher a clearer picture of the efficacy of entrepreneurship education. This study does not dispute the merits of intertwining various constructs to form a clearer picture, however this lies outside the research agenda presented here which was to present parallel findings from the various measures associated with entrepreneurship education for comparison.

Empirical limitations

The sample group were largely homogenous as the majority were Irish students and all were taking a common entrepreneurship education module. The study also acknowledges the possible presence of self-reporting bias (Azjen, 1988). While efforts were made to use the

measures in parallel, entrepreneurial passion was surveyed separately which makes its comparability less linear.

FURTHER WORK

Both self-efficacy theory and intentionality are now considered to be strong predictors of entrepreneurial behaviour and this is supported in the study outlined within. In particular, the results of the study strengthen the usefulness of emphasising entrepreneurial self-efficacy in entrepreneurship education. The construct relates to the self-belief an individual has about their capacity to succeed in creating a new venture (Drnovšek, Wincent, & Cardon, 2010; F. Wilson et al., 2007). In the delivery of entrepreneurship education therefore, prominence must be given to developing student mastery experiences, social persuasion and vicarious experiences in relation to new venture creation so they increase their perceived capabilities (Goddard, Hoy, & Hoy, 2004; Stumpf, Dunbar, & Mullen, 1991). Such experiences can be acquired from guest speakers who act as role models, teamwork and feedback measures (Maritz & Brown, 2013; Wilson et al., 2007).

Examining entrepreneurship education literature of late, it would seem that each of the theories described in this paper are making significant advances which will affect the knowledge and practice of the subject. While there is a growing consensus that ESE, entrepreneurial passion and entrepreneurial intentionality are linked, it appears that personality factors and traits seem to be less emphasised, and there are few attempts to connect them with other constructs. A notable exception by Sanchez (2013) combines observations using ESE, intentionality, traits and competencies such as proactiveness on a student sample. Work like this adds depth to our knowledge of the enterprising mind-set and subsequent intentions, and should be considered more specifically the field of entrepreneurship education. It is hoped that strengthening the instruments in use, and orienting them to be context-specific; the field will gain more legitimacy in terms of its empirical data for these new studies.

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BUILDING AND MAINTAINING A REGIONAL INTER-UNIVERSITY ECOSYSTEM FOR ENTREPRENEURSHIP: ENTREPRENEURSHIP EDUCATION CONSORTIUM

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ABSTRACT

This paper is about a collaborative effort of eleven colleges and universities in North East Ohio to create a regional ecosystem for undergraduate entrepreneurship education and support entrepreneurship in the area. The Entrepreneurship Education Consortium (EEC) has been operational since 2007 and won the USASBE award for innovative pedagogy in 2010. The paper reviews the development of entrepreneurship ecosystems in universities, discusses the uniqueness of the EEC ecosystem and its programs, and shares results and lessons learned in developing inter- University partnerships.

DEVELOPMENT OF ENTREPRENEURSHIP ECOSYSTEMS

From a "new enterprise" course for returning veterans offered in 1947, to over 5,000 entrepreneurship courses offered by two-year and four-year institutions by 2008, entrepreneurship education is one of the fastest growing disciplines. With over 20 million early stage entrepreneurs age 18 to 25 in the U.S. it is understandable why more and more institutions are building programs at the undergraduate, graduate and even the doctorate levels (Global Entrepreneurship Monitor,2010). Much of this growth has occurred since 1990 (Kauffman report, 2001; Katz, 2003; Kuratko, 2005).

Prior to 2000 these programs developed largely in schools of business (Kurakto, 2005; Katz, 2003). However, a study in 2000 by Bhide revealed only 25% of future entrepreneurs came from schools of business and engineering where most of these programs were housed. In an attempt to reach these non-business students and faculty the paradigm of entrepreneurship education began to change (Green, Katz, Johannisson, 2004).

The Ewing Marion Kauffman Foundation was a major thought leader in this effort encouraging institutions to envision new, interdisciplinary programs that transcended traditional academic silos; stretching across disciplines and schools within institutions; connecting the university community, outside as well as inside. The Kaufmann report advocated that universities must actively see these entrepreneurial ecosystems as an organizing concept in building their programs and understanding what they are doing (Kauffman, 2005). With this changing paradigm in which entrepreneurship education was delivered, many schools, some added by the Kauffman Foundation, formed centers to create an ecosystem for entrepreneurship on their campuses (Torrance, 2013). By 2005 there were over 100 such centers (Kuratko, 2005).

A good explanation of the variety of approaches to building ecosystems can be found in Entrepreneurship Programs and the Modern University (Morris, Kuratko and Cornwall, 2013). Some examples of university wide campus approaches are: supporting cross campus business plan and idea competitions; developing co-curricular activities to support entrepreneurship such as Texas Christian University's CEO club; or establishing learning communities as the University of Maryland's Hinman CEO's. Still other approaches have been to connect programs with other campus groups such as legal clinics, technical transfer units, or professional schools. Several universities have developed hatcheries/incubators to help developing entrepreneurs such as the one at Belmont University. Other approaches have expanded their campus ecosystem off campus through student run ventures (Millikin University) or successful study abroad programs (Baylor University). Still other universities have worked to build an ecosystem with specific groups outside of the University such as Jumpstart or the University of Syracuse's connection with the inner city.

Another approach to developing an ecosystem has been to develop partnerships between universities. As Morris, Kuratko, and Cornwall write, this can be difficult "as each institution has its own agenda and stakeholders. Schools must be able to move beyond a competitive mindset or a 'not invented here' orientation . . . and recognize how transformative partnerships can be" (2013, p. 224).

One type of these relationships are those in which universities partner for the good of a third party such as the Entrepreneurship Bootcamp for Veterans coordinated by Syracuse University which includes seven schools fairly similar size institutions drawn from various parts of the United States. Another type of partnership is to share resources between campuses. For example, the University of Wisconsin organized a system wide summit on entrepreneurship that brought together faculty from 12 of the 14 four and two year schools in the system (Torrance, 2013). Another such example is the Texas University Network for Innovation and Entrepreneurship (TUNIE) created in 2009 composed of Texas universities and health science institutions with academic programs to provide outreach, support technology and commercialization, promote collaboration, and increase awareness of entrepreneurship (Texas University Network for Innovation and Entrepreneurship LinkedIn, 2013). A similar approach is the Michigan Initiative for Innovation and Entrepreneurship founded in 2008, which is comprised of 15 public universities within that state. The purpose of this consortium is to gather capital and distribute grants to promote the development of new enterprises (ASU University Design Consortium, 2009).

ENTREPRENEURSHIP EDUCATION CONSORTIUM

This paper is about one such inter university transformative partnership, Entrepreneurship Education Consortium (ECC), and the ecosystem it has created. The EEC is a regional organization developed by the collaborative effort of private and public, large and small colleges and universities in Northeast Ohio. The mission of the EEC is to provide practical "experiential" and theoretical education to undergraduate students; preparing them to form either new enterprises or to work for existing businesses or start-up ventures and hopefully to reduce the "brain drain" by remaining in Northeast Ohio (Finkle, Soper, Fox, Reece & Messing, 2009).

The EEC differs from the inter university partnerships described earlier in that unlike TUNIE, the Wisconsin University and Michigan systems, it goes beyond sharing resources and expanding awareness to building and running programs together. Furthermore, it differs from the Syracuse initiative Boot camp in that the schools vary in terms of size, resources and mission and s are in the same area which may make competition for resources, funding, and students more of a problem. See Table 1 for a comparison of schools and characteristics (Carnegie Foundation for the Advancement of Teaching, 2010).

Table 1
Characteristics of Entrepreneurship Education Consortium Schools

Institution * denotes original member school	**Type**	**Undergrad Enrollment**	**College/ School of Business**	**ENTR Degrees Offered**	**ENTR Center**	**Other**
Ashland University*	Private; DRU; Prof+A&S/SGC	2,250	Y	Major	Y	
Baldwin Wallace University*	Private; Master's L; Bal/SGC	2,924	Y	Major, Minor	Y	Blackstone LaunchPad
Case Western University*	Private; Bal/HGC; RU/VH	4,016	Y	Minor	N	Blackstone LaunchPad
Cleveland State University*	Public; Bal/HGC; RU/H	11,722	Y	None	Y	SBDC
Hiram College (2010)	Private; A&S+Prof/ NGC; Bac/A&S	1,296	N	Minor	Y	
John Carroll University*	Private; A&S+Prof/ SGC; Master's L	2,949	Y	Minor	Y	Hatchery; EA
Kent State University*	Public: Prof+A&S/ HGC; RU/H	22,000	Y	Major, Minor, Certificate	Y	Blackstone LaunchPad
Lake Erie College (2010)	Private; Prof+A&S/ SGC; Master's S	1,200	Y	Major, Minor	Y	
Lorain County Community College (2013)	Public; Assoc; Assoc/Pub-U-SC	12,798	N	Associate, Certificate	N	Blackstone LaunchPad; GLIDE
University of Akron*	Public; Prof+A&S/ HGC; RU/H	22,619	Y	Minor	Y	
University of Mt. Union (2013)	Private; Prof+A&S/ NGC; Bac/Diverse	2,212	N	Minor	N	Stark Entre-preneurship Alliance

INCEPTION AND IMPLEMENTATION

In 2006 several directors and faculty of entrepreneurship programs in Northeast Ohio (NEO) met to discuss and share information about their new developing programs and to explore collaborative opportunities to enhance entrepreneurship education at the undergraduate level. After several meetings to brainstorm opportunities the group concluded that much more could be accomplished by pooling resources and expertise. To borrow from the popular entrepreneurial phrase to "think outside of the box," these individuals saw added value in "acting outside of their institutions."

After conferring with and receiving the "blessing" of their respective deans and presidents, the Entrepreneurship Education Consortium was formed in 2007 as a self-funded non-profit 501(c)(3) entity. Table 2 shows the EEC's founding Board of Directors. The founding directors chose to form as a separate entity in order to ensure autonomy, equal representation and collaboration.

Table 2
Entrepreneurship Education Consortium Founding Board of Directors (2007)

Phil Bessler	Baldwin Wallace University
Stephen Cook	The University of Akron
Scott Fine	Case Western Reserve University
Todd A. Finkle, Ph.D.	The University of Akron
Dan Fox	Ashland University
Mark Hauserman	John Carroll University
Lee McMannis	Kent State University
Julie Messing	Kent State University
Jack Reece	Cleveland State University
John C. Soper, Ph.D.	John Carroll University
Robert Stimpert	Ashland University

The seven founding schools - Ashland University, Baldwin Wallace University, Case Western Reserve University, Cleveland State University, John Carroll University, Kent State University, and The University of Akron- each contributed $6,000 as start-up funding for the new organization. The organization also solicited funding from a local foundation, The Burton D. Morgan Foundation, which focuses on entrepreneurship education in the NEO region.

Concurrently, The Burton D. Morgan Foundation had partnered with The Ewing Marion Kauffman Foundation to provide funding to private liberal arts colleges as part of the North East Ohio Collegiate Entrepreneurship Program (NEOCEP)/Kauffman Campus Initiative (KCI). This foundation partnership awarded funding to five area colleges to build or expand entrepreneurship programs across their campuses. With more schools in the region developing entrepreneurship programs, the EEC extended membership invitations to two of the five NEOCEP/KCI schools to expand its membership and as a funding strategy. In 2010, Hiram College and Lake Erie College joined the EEC. In 2013, the University of Mount Union and Lorain County Community College joined the EEC, bringing the membership to eleven NEO schools. Table 3 shows the EEC's current Board of Directors. New members pay a one-time $10,000 fee. All member schools are expected to contribute in-kind funding in the form of release of time for faculty and administrators for EEC activities, travel support, and the use of facilities for hosting events and meetings.

Table 3 **Entrepreneurship Education Consortium 2013-14 Board of Directors** (* denotes founding director)	
Read F. Wakefield	Ashland University
Phillip S. Bessler*	Baldwin Wallace University
Robert Sopko	Case Western Reserve University
Mark Dobeck, Ph.D.	Cleveland State University
Kay F. Molkentin	Hiram College
Mark K. Hauserman*	John Carroll University
Jeff Eakin	Lake Erie College
Julie Messing*	Kent State University
Lee S. Kolczun	Lorain County Community College
Matt Stinson	University of Mount Union
Robert Chalfant	The University of Akron

After the initial one time membership fee paid by each school, funding support for EIW and *ideaLabs* has come mainly from The Burton D. Morgan Foundation with additional gifts coming from individuals and the in-kind support of the member schools.

The emphasis of the EEC continues to be the development of entrepreneurship programming for undergraduate students of all disciplines in Northeast Ohio (NEO). The core focus of this programming is on teaching the entrepreneurial process through doing. Subsequent objectives include: build collaborative team experiences through programming and competitions; build and expand a network of young people interested in entrepreneurship in NEO; inform students of entrepreneurial opportunities and resources in NEO; increase the awareness of all schools and community stakeholders of the importance of entrepreneurship; increase the regional and national visibility and success of the EEC and Northeast Ohio; and create an innovative and collaborative education model to teach entrepreneurship that can be transferred to other regions (Finkle, 2009).

The two main programs of the EEC are – *Entrepreneurship Immersion Week (EIW)* and *ideaLabs*.

ENTREPRENEURSHIP IMMERSION WEEK

The first program launched by the EEC in 2007 was *EIW*, an intensive one-week, academic immersion experience for undergraduates from all disciplines to immerse themselves in the skills needed to help them develop new business concepts and apply these skills in a team-based business concept competition. Held on the campus of a hosting member's institution during the first week of August, *EIW* rotates annually among the member institutions. Each EEC recruits students from across their campus, with first priority given to rising juniors and seniors. The reason for the grade limitation is two-fold: 1) we want the students to return to their respective universities to continue work on their ideas, as well as recruit students for next year; and 2) to lessen the chance of any student transferring to another member school.

A team of five students from each school participates in a series of academic sessions focusing on the feasibility analysis process. Topics include: idea generation, opportunity recognition, market feasibility analysis, legal and intellectual property issues, start-up financials,

funding a start-up venture, networking and professional development, leadership and team building, ethics, etc. At the start of the week, students participate in several "ice-breaker" and team building exercises. Additionally, each team works throughout the week to develop a new product or service venture that has not been vetted by the group prior to arriving at *EIW* or that has been previously presented in a competition. The *EIW* curriculum has been designed to lead the students through the feasibility analysis process to help them prepare to present their idea to a panel of judges at the end of the week in a culminating competition.

The academic sessions are taught by both academics and practitioners (e.g. financiers, attorneys, entrepreneurs). In a more casual format *EIW* and *ideaLabs* alumni who have launched or are in the process of launching their idea, along with other young entrepreneurs and representatives from area accelerators/incubators are invited to share their experiences and resources with the students during the lunch sessions.

All of the EEC directors and several "special member" faculty also reside on campus during the week to help all the students through the idea generation, development and feasibility process. Although the students are working as their school team, the EEC directors and faculty have no school attachment for the week. From the beginning it is stressed to the students that the *EIW* faculty are available to share their knowledge, expertise and time with all students, regardless of school affiliation. This is a unique concept, which students at first find difficult to believe, but by the middle of the week have no problem reaching out to any and all of the faculty for help and guidance.

IDEALABS

ideaLabs is a regional competition encouraging undergraduate students from all disciplines to develop a new venture idea, apply the feasibility analysis process and present it to a panel of independent judges to determine a regional champion from among the EEC member schools. The event was first held in 2008 under the name Launch Town, when the EEC partnered with an informal group of entrepreneurs, angels and academics to host the competition (Schmidt, Molkentin, Messing, Bessler, 2014). Due to differences in pedagogical focus, the two groups dissolved its partnership after one year and the EEC switched to an undergraduates only model with a focus on the idea development process, rather than on business creation. In preparation for *ideaLabs* each EEC member school, working with the same competition guidelines, holds its own campus competition to determine a student or team (of up to five students) to represent them at *ideaLabs*. The members of the judging panel are entrepreneurs, angel investors and business leaders involved in Northeast Ohio's growing entrepreneurial ecosystem. All judges receive instruction on the use of the judging rubric that has been carefully designed to first and foremost evaluate the students' comprehension and execution of the feasibility analysis process.

RESULTS

The primary objective of the EEC is to provide undergraduate students from all disciplines with educational programming focused on the entrepreneurial process. Since its launch in 2007, a total of 285 students have participated in *EIW*, with the diversity of students

improving over the seven years: arts and sciences students 24% to 46%, females 30% to 41%; and minorities 20% to 31%. During the period of 2009 to 2013, over 660 students have participated in *ideaLabs* at the campus level to the regional competition, with participation by non-business majors increasing every year, from 24% in 2009 to 49% in 2013 (Schmidt, 2014).

A pre- and post-survey is administered to all *EIW* participants. In the beginning, the EEC used a lengthy survey that aimed to provide an overall assessment of all elements of weeklong program (e.g. length/content of sessions, food, amount of free time), self-assessment of attitudes and knowledge gained, and demographic information. The annual results from this survey were used by the EEC directors to evaluate presentations, presenters and the overall format of the program.

In 2010, a more streamlined self-assessment survey (SAS) was developed and administered pre- and post. The survey uses a 7-point Likert Scale to examine knowledge gained in the following areas: business plans; opportunity recognition; market feasibility and market plans; operating plans; financial planning; ethics; legal issues; staff and management building; and presentations skills. The survey also queries students as to their confidence level, desire to start a business and plans to stay in northeast Ohio. Survey results are summarized and used for continuous improvement of the program. Demographic information is now collected when the students register for the program. Table 4 shows SAS results from 2009 to 2013.

Table 4:
Results from *EIW* Pre- and Post- Student Self-Assessment Survey
Knowledge Base increased on a 7point Likert scale (NS - not surveyed)

	2009	2010	2011	2012	2013
Business Plans	NS	+1.48	+1.31	+1.36	+1.82
Opportunity Recognition	+2.03	+1.92	+1.96	+2.01	+1.63
Marketing Plan	+1.473	+1.01	+1.15	+1.49	+1.31
Operation Plan	NS	+1.52	+1.72	+1.63	+1.49
Financial Plan	+1.83	+1.37	+1.51	+1.52	+2.14
Ethics	+0.76	+0.93	+0.99	+0.48	+0.44
Legal	+1.21	+1.70	+1.84	+1.21	+1.47
Staff/Management	+0.72	+1.04	+1.60	+1.18	+1.13
Presentation	NS	+1.64	+1.61	+1.41	+2.03
Grand Mean	+1.47	+1.40	+1.52	+1.26	+1.50
% wanting to start a business	63%	74%	89%	67%	76%
% Planning to stay in NEO	NS	NS	36%	29%	33%

While the focus of both *EIW* and *ideaLabs* is on teaching the entrepreneurial process and not solely to create business, there have been a number of ventures launched with several promising ones in the development pipeline. Launched ventures include: Fresh Fork Market, 1st Place EIW 2007; DecisionDesk (formerly Citizen Groove), 1st Place LaunchTown 2008; NextToNothingBooks.com (originally Affinity Algorithms), 2nd Place *ideaLabs* 2011; 7th Symphony, *EIW* 2011 participant; Bradley's Chocolate Covered Strawberries, *ideaLabs* 2012 participant; and Bundle Media, *EIW* 2013 participants. In development ventures include: Pothole Patch LLC, 1st Place *ideaLabs* 2012; CustoME Color, 1st Place *EIW* 2011;

www.widdle.it and www.kudoala.com, *EIW* 2013 participant; www.carbonorigins.com, *EIW* 2012 participant; ReJoyn Zipper Solution, *EIW* 2013 participants; Mango, *EIW* 2013 participants; FeMailbox, 1st Place *EIW* 2013; AvaKare, 2nd Place *EIW* 2013; and KnotProfit, *ideaLabs* 2014. Additionally, several of these start-ups have gone on to participate in area accelerators/incubators such as Bizdom, MAGNET, Technology Accelerator Alliance and Flashstarts, and several have received external funding from the Great Lakes Innovation and Development Enterprise Fund.

In addition to these student results, the EEC has developed the creation of an inter-university ecosystem and a culture of collaboration. The member schools share information on programs, best practices, and speakers not only for *EIW* but also for curriculum development. For example, twice when EEC schools have conducted internal programs to develop their own non-business faculty, directors have invited other directors and faculty from the EEC member schools to attend the programs for ideas. Directors have even shared faculty bios and resumes when a member was looking for adjunct or new positions. In fact, two faculty members have moved between EEC schools to accept new positions. Finally, the members serve as an informal sounding board for problems such as dealing with the administration or program management.

WHY THIS WORKS

In their analysis Morris, Kuratko and Cornwall (2013) assert that in effective inter university partnerships it is essential that "each has a stake in the initiative (or "skin in the game") (p. 224). This was also one of the primary concerns of the founders of the EEC (Finkle, 2009). The EEC has done this by rotating the two signature programs between the schools. In this manner all schools have involvement with and responsibility for the programs. Furthermore, no school or institution is viewed as the dominant player in planning or implementation.

A second factor identified was that the effort "fits well with the mission and resources of each school" (Morris, 2013, p. 224). On the surface this could have been an obstacle for the EEC. A quick look at the member schools (Table 1) clearly shows differences in university missions and in resources (even in regard to entrepreneurship). However, in forming the EEC these schools all adopted the mission of developing students. The founders established a new organization with a specific mission rather than work with the variety of institution missions. Further, as mentioned earlier, the signature programs do not focus on fully developed business plans, although as indicated above many of them will become that, but on idea development-central to the educational mission of all of the schools. Perhaps this focus makes it easier for participating faculty/administrators to interject much in the same way that they work with students in developing research projects or papers collaboratively and as a facilitator rather than as a coach in a competitive contest.

Additionally, "collaboration is personal not institutional" and entails mutual adaptation, ongoing engagement and adjustment, a willingness to listen, and a commitment to ensuring both party's objectives are being met" (Morris, 2013, p. 224). The EEC builds this collaboration in several ways.

First, EEC members meet monthly to discuss programming, funding, and share resources. This frequent interaction allows directors/professors to know each other and develop personal

relationships. An example of this interaction is the schedules for *ideaLabs* and *EIW* that are developed, reviewed and approved at the monthly meetings of the board. The board also makes site visits to the hosting school to be "a second set of eyes" and provide suggestions, as many have hosted previously.

Second, the EEC makes this collaboration a part of their programs. A good example of this collaborative attitude occurs during Immersion Week. As mentioned earlier, during *EIW* faculty/ directors make a commitment to support all teams in idea development. Faculty are expected to informally visit different school teams during the week and offer advice and network resources to them on their idea. Formally, there are two sessions in the program where faculty members from all schools provide advice and suggestions to the teams. The first occurs mid-week when all teams present their pitch on potential ideas to all faculty and the second is on Thursday night when combined faculty hear and give advice on presentations to the teams. Additionally, when a school has been unable to fill its team or support a team at all, for whatever reason, the team is filled or a "blended team" is formed with members from other schools. In the case of a "blended team", faculty from several schools work directly with that team, as if it were their own school's team. Students develop connections with each other and faculty/directors from other schools and many stay in touch after the program as they continue to work on launching their idea.

The result is the creation of a culture of collaboration in that focus is on developing ideas. While entrepreneurs are competitive, they must also develop an openness to explore and look for support and resources. This program models that skill and connection moving students beyond the attitude that "if I tell you my idea, I will have to kill you" to realizing that in order to develop an idea one needs to discuss and evaluate it.

CONCERNS

One issue that the EEC has struggled with, and still does, is how far can this network go and still maintain this culture? The original founders believed that the EEC should only include four year schools (Finkle, 2009). Yet the current leaders have expanded membership to include a community college. Leadership still maintains the regional aspect to the system rather than expanding to the state so that the culture can be sustained through direct interaction of the monthly meetings and program exchanges.

The culture of collaboration has remained even though only three of the original founders are on the current board. In an effort to preserve this connection, the current board has worked to document and create a history in several ways. A data base of participants has been established so that students can connect with each other. Another way has been to develop honor and highlight heroes and their beliefs through emeritus or honorary member status. Telling their stories serves to reinforce the underlying values of the organization. Additionally, articles such as this also reinforce organizational norms and behaviors.

Fundraising has been another issue around which the EEC has had difficulty. Institutional issues arise as everyone is funding for their own schools as well as attempting to fund raise for this program. From the perspective of their home institutions this presents a conflict of interest.

Additionally, many of the schools are receiving support from the same sources that would be interested in the EEC's programs.

LESSONS LEARNED

In the process of starting and expanding this regional inter-university collaborative, the EEC has worked through a number of key issues and learned important lessons worth sharing.

Stay Focused

The original founders encouraged the organization to stay focused on the objectives to avoid distractions, such as expanding too quickly or for the wrong reasons (Finkle, 2009). The EEC has done this, but has also been open to making changes when needed such as the inclusion of a community college.

Maintain Diversity

Maintain the diversity in students and schools. Of the 11 schools: 7 are private and 4 are public; 6 are liberal arts and 8 have a business school; and 6 have student populations under 3000, 3 with populations between 4,000 to 13,000, and 2 have student populations over 20,000 (Schmidt, 2014). The heterogeneity in the consortium's composition stimulates approaches to programming and resolving issues as it encourages the discussion of different perspectives and needs.

Autonomy and Ownership

Keep the organization autonomous and make sure that everyone "has skin in the game" by rotating the programs (*EIW* and *idea Labs*) among the schools; recognizing that each member of the group needs to be ready to contribute both cash and sweat equity when needed (Finkle, 2009).

Mix Matters

The "mix" of the directors does matter. That is not to say that everyone needs to be like-minded. As a matter of fact, we have found that having individuals with different views has been most beneficial. Everyone needs to be there because they want to be; not because they were assigned by their dean or president. It works best when everyone is there for the same reason – the students.

Maintain Focus on Collaboration and Students

On one level, all schools are competitors (for student enrollees, for outside support, and for media attention), but on another level, the EEC can cooperate to produce significant regional outcomes. Examples of collaboration are: during EIW the directors of all schools work equally with all of the teams to help them develop their ideas; when schools have been unable to support

a full team, a team has been completed or formed with members from several schools (Schmidt, 2014).

Communicate

The EEC board meets monthly, and more frequently in the two months leading up to its major events, *EIW* and the *ideaLabs* (Schmidt, 2014).

Hire Help

Hire competent outside help when necessary and if funding allows, i.e., legal, auditing, insurance, program evaluation, web development, and fundraising (Finkle, 2009). EEC has continued to follow this approach, which has reduced uneven pressure on certain directors of institutions thus eliminating an unequal balance in responsibility.

CONCLUSION

Uniquely, the EEC has formed a powerful regional network of faculty, students and staff to share undergraduate course ideas and materials. It recognizes that creativity in all fields is enhanced by understanding and employing sound business principles. It embraces both cooperation and competition. Its membership includes both private and public institutions. It taps into a legion of regional entrepreneurs, businesses, and supportive enterprises for curricular and extra-curricular programs. Last, while its focus is on educating undergraduate students in entrepreneurial studies, it seeks to have a long term impact on new business creation, job enhancement, and regional wealth.

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EVALUATING THE EFFECTS OF A PROBLEM-BASED LEARNING BUSINESS PLANNING COURSE ON STUDENT ENTREPRENEURIAL INTENTIONS

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ABSTRACT

This study examines how a Problem-Based Learning, business-planning course affects student entrepreneurial intentions before and after completion of the coursework. The study looked at student entrepreneurial intentions and the effect of entrepreneurship education in the context of entrepreneurial self-efficacy. That is, perceived competencies indirectly influence intentions to start a new business through the mediating role of entrepreneurial self-efficacy (Zhao et al., 2005). This analysis seeks to address two primary aspects of the coursework: the student's attitude toward the success of the new business venture chosen and, the student's attitude toward self-employment via starting or acquiring a new business (James and Bell, 2013). Student responses were gathered at the point of concept adoption and again at the completion of the written coursework. The findings offer lessons for policy makers and more questions for researchers.

INTRODUCTION

This paper will first examine the existing literature in an attempt to demonstrate the linkages between the three legs of a three-legged stool; entrepreneurial education, entrepreneurial self-efficacy, and entrepreneurial intentions. Upon completion of the literature review the authors will propose two hypotheses to be tested, followed by a discussion of the paper subject matter survey and survey methodology. The objective of is to demonstrate entrepreneurial learning by showing respondents change in perception, in pre- and post-course survey responses, regarding the perceived success of their chosen venture. The authors contend that if responses to the perceived success of a venture change post-coursework, the students by default possessed some level of entrepreneurial learning. Once entrepreneurial learning within the group is established, based upon existing literature (see within), we can assume increased entrepreneurial self-efficacy. The paper then goes on to examine if entrepreneurial education and entrepreneurial self-efficacy affect entrepreneurial intent. Entrepreneurial intent is measured by a change pre- and post-survey in respondents' willingness to participate in a select set of entrepreneurial ventures.

LITERATURE REVIEW

Over the last 20 plus years significant attention and resources have been devoted to entrepreneurial education at the university level. In 1971, only 16 academic institutions offered

entrepreneurship education. By 2010 the number of academic institutions that offer entrepreneurship had grown to over 2000. (Hatten, 2012)

Solomon, Duffy, and Tarabishy (2002) suggested that greater exposure to entrepreneurship education would lead to greater numbers of start-up ventures. And Drost (2010) later proposed that there is evidence of a positive relation between entrepreneurship education and venture creation.

When contemplating one's career choices, entrepreneurship is considered one of the most risky and unstable choices one can make (Campbell, 1992). As an entrepreneur, one is often faced with everyday work and life situations with continuous increases in levels of uncertainty, difficulties, failures, and frustrations directly associated with the process of new venture creation (Audit, 2000). It seems as if one would hesitate to consider an entrepreneurial career feeling less than confident to perform the necessary tasks demanded by the creation of his or her own business venture.

Intentions are conceived as immediate antecedents of actual behavior (Ajzen, 1991). Intention-based models have attracted considerable attention of researchers as they offer a great opportunity to increase our understanding and predictive ability for entrepreneurship (Krueger, Reilly, and Carsrud, 2000). Significant research has concentrated on psychological factors as contributors to entrepreneurial intentions. Among these factors are: a high need for achievement, a desire for autonomy, a proclivity for moderate risk taking, aggressive competitiveness, an internal locus of control and a flair for innovation (Gartner, 1989; Reynolds, 1995; Timmons and Spinelli, 2004; Zhao, Seibert and Lumpkin, 2010; Spinelli and Adams, 2012).

Chen, Greene, and Crick (1998) provided empirical evidence that entrepreneurial self-efficacy, defined as an individual's confidence in his or her ability to successfully perform entrepreneurial roles and tasks, was positively related to students' intentions to start their own business. Zhao, Seibert and Hills (2005) establish the basis for the influence of entrepreneurial education, self-efficacy, and their effects on entrepreneurial intentions. Their study found that individuals choose to become entrepreneurs (or at least formulate the intentions of doing so) because through entrepreneurial education they gained confidence to undertake a new venture.

Others like, Douglas and Shepard (2002) examined the link between attitudes toward work, risk, independence and income, and intensions to become self-employed. They parted from prior works that focused on theoretical perspectives of economic factors, and empirical research as to when people become self-employed, and focused on macro-economic and demographic factors, to determine individual attitudes toward self-employment. They found that attitudes toward risk tolerance and independence contributed positively toward entrepreneurial intentions.

But, there is a recent shift in entrepreneurship research from the investigation of entrepreneurial characteristics from ex-post facto perspectives to investigating ex-ante influences on entrepreneurial behavior. This shift is important particularly to curriculum designers and policy makers if the intention of including entrepreneurship studies in university curricula is to augment post-education incidence of entrepreneurship. (Byabashaua and Katono, 2011) This examination of ex ante influences on entrepreneurial intentions specifically goes on to acknowledge the impact entrepreneurial education has on entrepreneurial intentions.

Entrepreneurial self-efficacy can be defined as the strength of an individual's belief that he or she is capable of successfully performing the roles and tasks of an entrepreneur. A theory, developed by Bandura (1997) and later discussed by Drost (2010), asserted that self-efficacy is developed through students' mastery of skills, identification with role models, social persuasion by important others (such as peers, parents, professors and role models) and judgments about their own physiological states (e.g. entrepreneurship makes me feel exhilarated, rather than frightened).

Where Luthje and Franke (2003) concluded that personality traits have a strong impact on attitudes toward self-employment, Drost (2010) in a Finnish study, found that entrepreneurial self-efficacy is a strong predictor of entrepreneurial intentions. She identified variables that enhance entrepreneurial self-efficacy through entrepreneurial education. Those variables include particular specific practical and educational experiences that lead to increased exposure to role models, persuasion to increase students' confidence in themselves and assistance in coming to terms with students' anxiety when they are, in fact, actively involved in the excitement of entrepreneurship. Drost (2010) concluded that entrepreneurial education positively influences students' confidence that they are truly able to start their own business within five years.

Other literature has shown that predicting entrepreneurial behavior by modeling personality or demographic characteristics results in a diminutive explanation of entrepreneurial intentions, relying on the assumption that individuals who have similar characteristics to a typical entrepreneur would behave entrepreneurially. The results of the Buelens and Izquierdo (2008) study of entrepreneurship and the effect of entrepreneurial intentions through its impact on attitudes and self-efficacy provided initial evidence that perceptions of the derived effect of entrepreneurship education are positively related to entrepreneurial self-efficacy. More specifically, the Izuierdo and Buelens (2011) work on perceived competencies provided evidence that education indirectly influences intentions to start a new business through the mediating role of entrepreneurial self-efficacy. In this context, both Drost (2010), and Izquierdo and Beulens (2011) establish a nexus between entrepreneurial education and entrepreneurial self-efficacy.

A German study investigated whether pre- and post-test entrepreneurship education affected intentions to be entrepreneurial uniformly, or whether it led to greater sorting of students. In that study, Von Graevenitz, Harhoff, and Weber (2010) develop a new conceptual perspective that emphasizes learning and discovery of one's own aptitude for entrepreneurship. In this view, entrepreneurship education allowed students to better assess whether they should pursue an entrepreneurial career. Their view differed significantly from the implicit notion that entrepreneurship education somehow enhances students' willingness to become entrepreneurs. They showed that if students differ in their aptitude for entrepreneurship, and if entrepreneurship education helps them uncover these differences, entrepreneurship education might not always lead to stronger entrepreneurial intentions on average. Especially students who are initially uncertain about their entrepreneurial aptitude are able to determine more clearly whether or not they are suited to entrepreneurship after the course. They also concluded that entrepreneurship education acts as a matching event where students can assess entrepreneurial aptitude versus other career paths.

The von Graeventiz, et al (2010) study is very important because it demonstrates that entrepreneurial education can act to reinforce entrepreneurial intention, or conversely, provide an

entrepreneurial educational platform to conclude that an entrepreneurial career is not desirable. Or stated another way, a reduction in entrepreneurial intent is an equally acceptable outcome to entrepreneurial education.

A study by Carey, Flanagan and Palmer (2010) indicated that intentions to start small, high income and high growth ventures share many commonalities and are significantly driven by behavioral beliefs and perceived behavioral control. Intentions to start small lifestyle ventures, on the other hand, are found to be independent from intentions to start either small, high income or high growth ventures and are not as well explained by the theory of planned behavior. Acknowledging the differences in types of entrepreneurial ventures has strong implications for better understanding student entrepreneurial intentions and what drives these intentions. This suggests that students identifying a particular type of business would have an effect on entrepreneurial intentions. It is interesting to note that while this literature looks at a variety of important motivators that impact student intentions toward entrepreneurship, the literature thus far has viewed entrepreneurial intentions as a homogeneous construct. The authors of this paper recognized a potential continuum that could plot venture-type associated risk with corresponding effect on respondent entrepreneurial intentions.

Byabashaua and Katono (2011) formulated a pre- and post-coursework survey testing the effects of entrepreneurial education over a four-month period on a student population in Uganda. Analyses included tests of significance of changes in the attitudes and intentions of students after the entrepreneurship course, the mediating role of attitudes, and the moderating role of employment expectations. The results demonstrate small but significant changes in attitudes and a significant mediating role of attitudes — perceived feasibility, perceived desirability and self-efficacy. However, they did not find statistical support for the moderating influence of employment expectations. A major objective of this research was to establish whether college entrepreneurship training increases the intention of college students to start businesses. Results of the study did not provide sufficient evidence to sustain the claim for a direct relationship.

Finally, this survey was delivered in a Problem-Based Learning (PBL) course environment. Over the years, much has been written on PBL including work by Barrow (1996), and also Gijselaers (1996). They assert that PBL begins with the assumption that learning is an active, integrated, and constructive process influenced by social and contextual factors. In their review of the literature, Wilkerson and Gijselaers (1996) claimed that PBL is characterized by a student-centered approach, teachers act as facilitators rather than disseminators, and open-ended problems (or also referred to as, ill-structured) serve as the initial stimulus and framework for learning. Instructors also hope to develop students' intrinsic interest in the subject matter, emphasize learning as opposed to recall, promote group work, and help students become self-directed learners. Bell (2008) took the concept of PBL a step further and specifically applied PBL teaching and learning methodology to a business-planning course. The concepts of PBL would seem to contribute to entrepreneurial self-efficacy and impact entrepreneurial intentions.

TESTING

The first hypothesis set forth in this paper is that the net effect of PBL entrepreneurial coursework will change the student perceptions of their entrepreneurial venture. The second

hypothesis is that a student's entrepreneurial intentions toward future self-employment and entrepreneurial activity will be positively affected by PBL entrepreneurial coursework.

The H1 analysis serves to establish a change in perception or to demonstrate that some level of learning took place to change respondent perceptions. Considering the breadth of interpretation of the subject, perceived success of a business concept, even slight movement would seem to demonstrate a degree of learning.

The H2 analysis serves as an evaluation of the entrepreneurial intentions of future entrepreneurs before completing the given coursework, compared to the entrepreneurial intentions of future entrepreneurs, after completing the given coursework. And as Zhoa, et al (2005), Drost (2010) and others suggested, entrepreneurial educational attainment increases self-efficacy and increased entrepreneurial intentions.

METHODOLOGY

Due to their relevance and ease of accessibility, the students enrolled in the New Venture Creation course at the University of Arkansas at Little Rock during the 2012 spring semester were surveyed. The survey was administered in two-parts; a pre-course survey was completed soon after the business venture idea was conceived, and a post-course survey was completed just prior to completion of the written coursework. At the beginning of the course, students were issued both the pre-course and post-surveys and asked to only complete the pre-course survey. The students retained the survey and were asked to complete the post-course survey just prior to the end of the coursework and then anonymously submit the survey to the instructor.

The test sample consists of thirteen of the total eighteen students enrolled in the New Venture Creation course for the 2012 spring semester. Participation in the survey study was strictly voluntary and potential survey respondents were assured of confidentiality and anonymity. Participants were also informed that no survey information would be reviewed until after final course grades had been formally submitted. No incentives of any kind were offered to the survey participants for their participation in the survey. The researchers were unaware of the identities of the respondents to this study.

SAMPLE OF SURVEY RESULTS

The survey consisted of items that covered gender, race, business owners/non business owners, age, and current grade point average. Other items included in the survey covered the source of idea for the business plan, perceived future success of the idea, willingness to pursue the idea after course completion, student perception of the business planning process, ability of the venture to raise capital to start the business, attitude toward the ability to gain investment money from federal and/or state government, interest in starting or acquiring a new business immediately and/or within the next five to ten years, and interest in starting or acquiring and building a high growth (20% or more annual growth year after year) within the next five to ten years.

The thirteen survey respondents included eleven undergraduate students and two graduate students. Among the respondents were nine males and four females. The ethnicities of the respondents included eight Caucasian students, two African American students, two Asian or

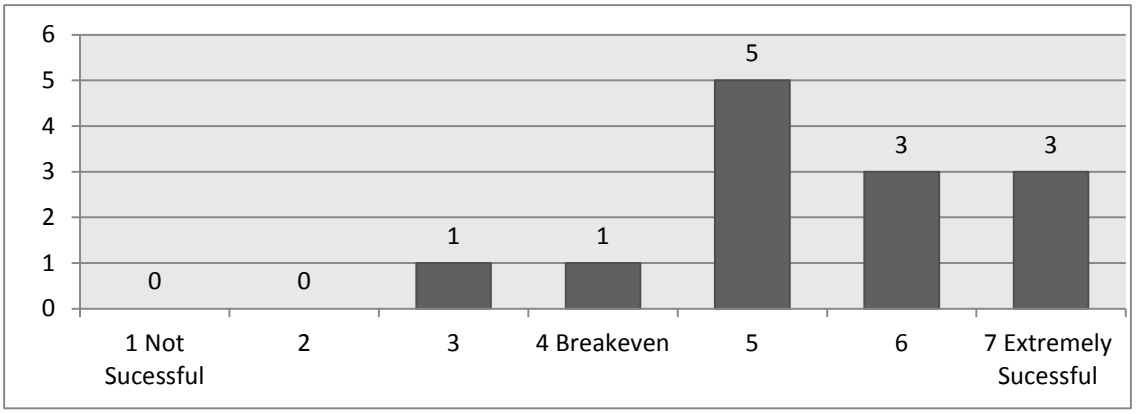
Pacific Islander students, and one no answer. Three of the thirteen respondents had previously owned or currently own their own business. Of the thirteen participants, three worked full-time (more than 36 hours per week), five worked part-time, and five were not currently working.

RESULTS

H1: The net effect of PBL entrepreneurial coursework will change the student perceptions of their entrepreneurial venture.

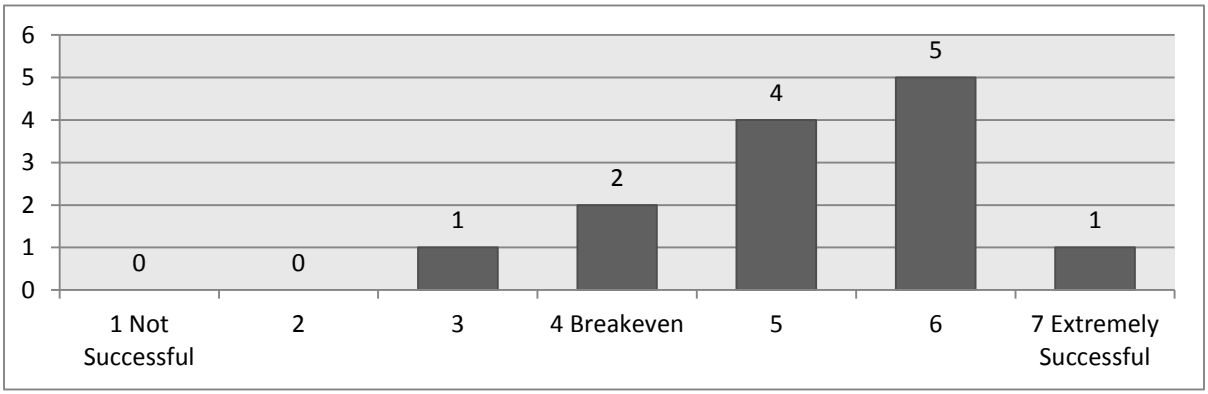
Question Two of the pre-course survey asked the respondents to rank how successful he/she perceived the business idea to be using a seven-point Likert scale, with one being "not successful" and seven being "extremely successful". Again, the respondents completed this question once the business idea was conceived but prior to any additional written coursework was completed. The pre-course survey responses for Spring 2012 are presented in Tables 1.

Table 1
Pre-course Survey Question 2



By way of comparison, Question One of the post-course survey asked the respondents to again rank how successful he/she perceived the business idea on a seven-point Likert scale, one being "not successful" and seven being "extremely successful".

Table 2
Post-course Survey Question 1



After completion of the PBL business planning coursework, there was obvious movement in the responses but no dramatic movement. Even with a lack of dramatic movement, it would be fair to say the net effect of entrepreneurial coursework did change the student perceptions of their perceived success of the entrepreneurial venture. Thus, Hypothesis One is supported.

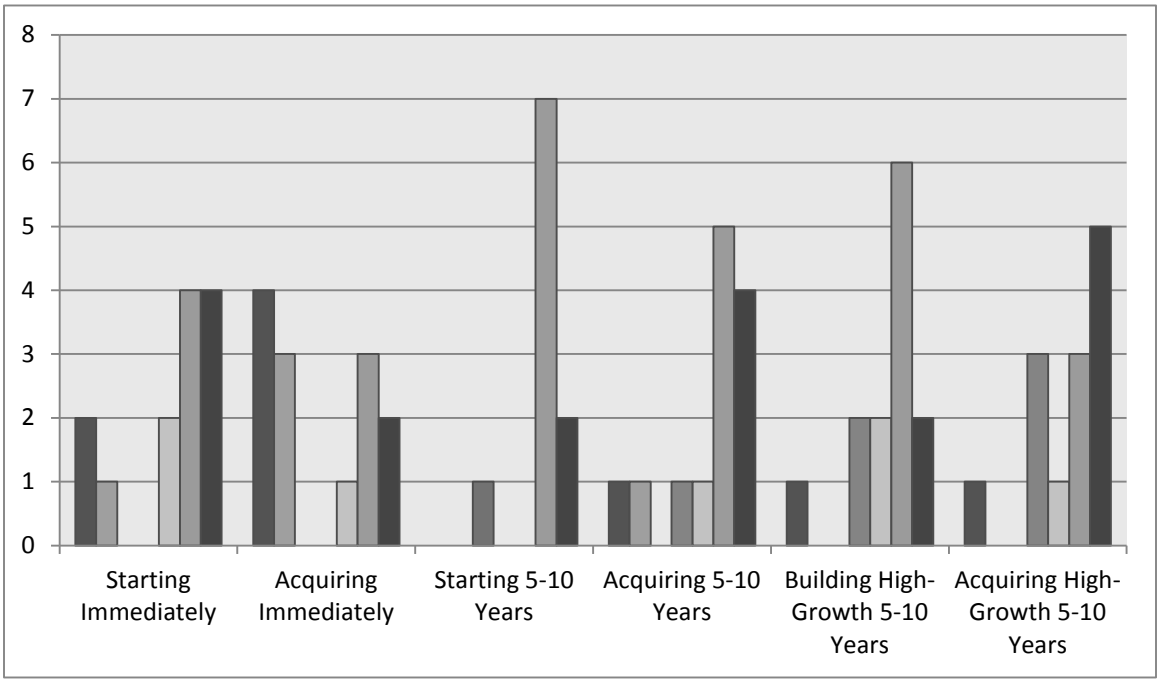
H2: A student's entrepreneurial intentions toward future self-employment and entrepreneurial activity will be positively affected by PBL entrepreneurial coursework.

Questions 7 through 12 of the pre-course and Questions 8 through 13 of the post-course survey asked the participants to rank their level of interest:

- *In starting or immediately following the completion of the business planning course,*
- *In acquiring a new business immediately following the completion of the business planning course,*
- *In starting a new business within five to ten years after completion of the business planning course,*
- *In acquiring a new business within five to ten years after completion of the business planning course,*
- *In starting and building a company into a high-growth (20% or more annual growth year after year) business within the next five to ten years after completion of coursework, and*
- *In acquiring and building a company into a high-growth (20% or more annual growth year after year) business within the next five to ten years after completion of coursework.*

Respondents were asked to rank their interest on a seven-point Likert scale, with one being "no desire" and seven being "absolute desire" (left to right by category in the Table) for each Question 7 through 12. The pre-course survey responses are presented in Table 3.

Table 3
Pre-course survey Questions 7 - 12



Respondents were asked again to rank their interest one through seven, with one being "no desire" and seven being "absolute desire" for the post-course survey Questions 8 through 13. The post-course survey responses are presented in Table 4.

Table 4
Post-course survey Questions 8 - 13

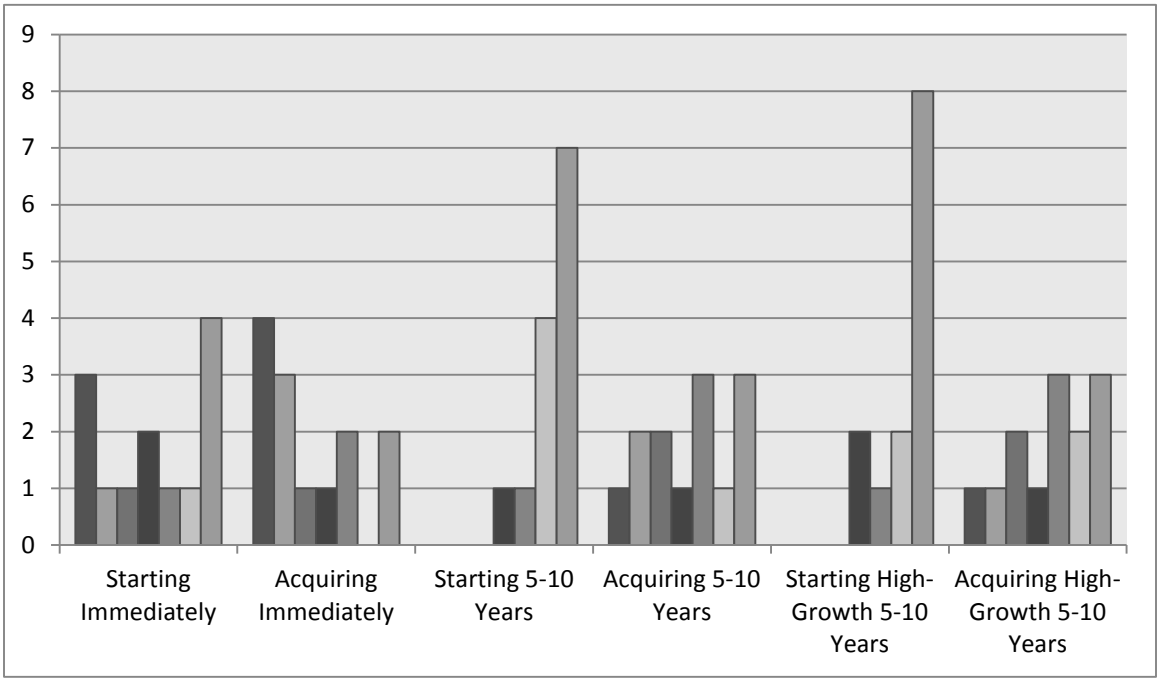


Table 5 (below) is a summary of the outcomes in Tables 3 and 4. Table 5 examines those with higher entrepreneurial intentions or desire (responses of 5 or higher) and those with lower entrepreneurial intentions or desire (responses 3 or lower). The Table also displays the change/difference in those intentions between respondents completing the pre-course survey and the respondents completing the post-course survey.

Table 5						
	Responses ≥ 5			Responses ≤ 3		
	Pre-course	Post-course	Change/ Difference	Pre-course	Post-course	Change/ Difference
Starting a Business Immediately	6	6	0	3	5	+2
Acquiring a Business Immediately	4	4	0	7	8	+1
Starting a Business in 5-10 Years	7	12	+5	3	0	-3
Acquiring a Business Within 5-10 Years	7	7	0	2	5	+3
Starting a High-Growth Business in 5-10 Years	10	11	+1	1	0	-1
Acquiring a High-Growth Business in 5-10 Years	7	8	+1	1	4	+3

In comparing those that expressed a stronger intention to become an entrepreneur (responses of 5 or higher), in both the pre- and post- survey responses, the respondents remained consistent when it came to starting or acquiring a business immediately (6 and 4 respectively), and also observed increases in each ranked category of interest thereafter, except Acquiring a Business Within 5-10 Years, which stayed the same (7). The most dramatic increase was observed in the response from Starting Their Own Business Within 5-10 Years which grew from 7 respondents to 12. Each of the other two categories saw increases of one, from 10 to 11 and from 7 to 8. The outcomes would seem to indicate that those that possessed strong near-term entrepreneurial intentions prior to the course were not affected by the coursework. Those respondents that had intentions to pursue entrepreneurship at some later date (5 to 10 years into the future) seem to be positively affected by the coursework.

Conversely, those ranked categories of interest that received responses of 3 or less (lower entrepreneurial intentions) saw more movement across the categories. This would seem to imply that as students gained entrepreneurial knowledge and increased self-efficacy, more students were less likely to pursue entrepreneurial activity.

In summary, in reference to H2, the survey results would seem to indicate:

- *Those that entered the course and were more entrepreneurial intended, remained so and were not affected by the coursework.*
- *Upon the completion of the coursework more respondents were averse to entrepreneurship.*
- *Upon completion of the coursework, more respondents were apt to be entrepreneurial at some future date (5-10 years)*

In general, what might be termed conflicting, two observations were made. First, as entrepreneurial knowledge was acquired, more students became entrepreneurially averse (an increase in 4 of 6 overall categories). Second, it was also observed that as entrepreneurial self-efficacy was acquired, there was significant entrepreneurial intent in Starting Their Own Business Within 5 – 10 Years, increasing from 7 to 12. At this time, the data seems to neither support nor reject H2 and could be termed inconclusive.

DISCUSSION

The purpose of this study was to gain a better understanding of the perceptions and intentions of entrepreneurial students at the beginning and upon completion of coursework in a PBL business-planning course. The survey analysis was an attempt to illustrate how the completion of this course affected the students' attitude and perception of an entrepreneurial concept, in addition to, how self-efficacy might influence intentions regarding the choice of an entrepreneurial career.

For example, Buelens and Izquierdo (2008) focused upon the effect of entrepreneurial education on entrepreneurial intentions by examining attitudes and self-efficacy. Their analysis addressed the students' entrepreneurial intentions in a similar analysis of a pre- and post-course activity and its impact on entrepreneurial intentions. Their results indicated that individuals who self-reported higher on competencies for entrepreneurship, each reported higher levels of entrepreneurial self-efficacy and, in turn, higher entrepreneurial intentions. Likewise, students who

exhibited higher attitudes toward entrepreneurial acts each reported higher intentions to start a new business.

Here, the survey findings indicate that as the students' entrepreneurial knowledge and corresponding self-efficacy changed (see also, Zhao et al 2005), the perception of the potential success of the business concept changed. Relying on Buelens and Izquierdo (2008), it could be said that as student self-efficacy increased via course completion, their intentions to embark on an entrepreneurial career changed. The interesting aspect of the change observed here, is that it is somewhat in contrast to Buelens and Izquierdo (2008) and seems to be more supportive of the Von Graevenitz, Harhoff, and Weber (2010), and Byabashaua and Katono (2011) study results. Their survey results showed the students moved in both directions, with some respondents becoming more entrepreneurial intended, and some becoming less entrepreneurial intended.

IMPLICATIONS FOR FUTURE RESEARCH

The authors intend to continue to collect survey data along with continued analysis of the survey results. The analysis will attempt to determine additional influences in an attempt to gain a better understanding of entrepreneurial intentions, and the effect of business planning coursework on those intentions. In addition, the survey was an attempt to evaluate the effect of entrepreneurial course work on the class participants' perception of the viability of entrepreneurial concepts, pre- and post-coursework. The idea was to illustrate a nexus between change in concept perception in relation to knowledge gained, and corresponding self-efficacy. The authors believe this nexus could be further explored, expanded, or other proxies could be introduced for demonstrating self-efficacy.

The opportunity to continue to define the effects of entrepreneurial education on student intentions may help define specific individual traits or triggers that may affect entrepreneurial decision-making. As the respondent base grows, the conclusions contained herein, or as expressed in other literature, could be further supported or contradicted. Because the sample size was limited, future results could vary greatly from these preliminary findings. Additional literature suggests how the relationship of gender (Wilson, Kickul and Marlino, 2007; Gupta, Turban, Wasti, and Sikdar, 2009; Kokkenan, 2011), ethnicity (Prieto, 2011), or international perspectives (Byabashaua and Katono, 2011) might play when looking at self-efficacy and entrepreneurial intentions.

The authors also might ask the affect of a single course instructor versus that of the Zhao, et al (2005) study that surveyed students across an entire MBA curriculum. Could individual instructor personality affect student self-efficacy? Additional work might also look into the affects of a PBL classroom environment on survey participants versus other classroom delivery methods.

CONCLUSION

The information from this ongoing survey will provide the researchers continuous opportunities to interpret the relationship of educational coursework to entrepreneurial intentions. With the information given and knowledge gained using this survey approach, the researchers could potentially offer specific and essential coursework material for future entrepreneurial

students. It will be interesting to carry this research further to enrich our understanding of the extent to which intentions are converted into entrepreneurial actions. For example, one intervening variable suggested by Shapero and Sokol (1982) is the individual's propensity to act. The general belief is that intentions lead to behavior (Azjen, 1987, 1991; Bird and Vozikis, 1994) but it would be interesting to know what mediates or moderates this relationship.

The survey results here, though preliminary, seem to indicate coursework has an influence on entrepreneurial perceptions and intentions, and that coursework can both influence greater and lesser entrepreneurial intention.

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