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Determining the viability of a college or university-based business incubator: A comparative assessment of feasibility studies

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Executive Summary: This article explores the various elements of assessing the feasibility of developing a college or university-based business incubator. It is a narrative review of seven incubator feasibility studies, one of which is directed by the author. The purpose of the article is to outline the common elements of these studies, assess the goals of these studies, and provide a framework that institutions of higher education in other communities can use in assessing the viability of an incubator in their area. This article will seek to determine what true value the performance of a feasibility study provides to the entity seeking to establish an incubator. Given the sparse academic research conducted prior to an incubator's formation, this article is meant to complement prior research that explores the operational aspects of established incubator programs and to assist higher education administrators in the exploratory stages of establishing a business incubator. This article looks at seven community efforts prior to their launch of a business incubator and seeks to identify thematic areas and common processes that were used to determine whether or not sufficient conditions existed to warrant the establishment of a new business incubator.

I. Introduction

When Joseph Schumpeter wrote his *Theory of Economic Development* (1934), he highlighted the role the entrepreneur plays in spurring economic activity. He postulated that the concept of development is the disruption of "circular flow or in the tendency toward equilibrium," (p. 63). This disruption occurs through innovation and entrepreneurship. The entrepreneur, in Schumpeter's estimation, plays a primary role in that he/she challenges old products and processes and uses innovation to introduce new products to market, develop a better way of doing business, or fulfill an unmet consumer need. It is this 'discontinuous' change that serves as the core of economic development (Schumpeter, 1934). Old companies and processes are constantly being replaced by innovative entrepreneurial companies and concepts. It is this propensity to spur innovation that makes entrepreneurs well-positioned to benefit from an environment and infrastructure that facilitates the disruption that Schumpeter attributed to innovation and entrepreneurship.

In today's economic environment technological breakthroughs, such as the Internet and 3D printing, have led to the democratization of information and of the manufacturing process. Virtually any aspiring entrepreneur with an innovative concept feels as though they can compete in the global economy. The prevailing thought is that anyone, anywhere has at their disposal the ability to launch a business enterprise. Many researchers have postulated that when it comes to economic development, access to a robust technological infrastructure enables entrepreneurs to challenge old processes and introduce new products to market (McKinsey Global Institute, 2013;

Li, 2014; Ling & Yi, 2015; McKinsey & Company, 2012). Programs such as the Massachusetts Institute of Technology inspired Fab Lab are encouraging innovators to create and giving university and community leaders in virtually every location and every stage of economic development the opportunity and hope that their city or town can become the next Silicon Valley or Research Triangle.

Yet the question remains: what role, if any, should institutions of higher education play in fostering this type of disruptive change? Can these institutions serve as champions of the process and lay the groundwork for entrepreneurs to develop new businesses and business practices? Do technology-led business incubators extend beyond the development of incremental change and facilitate the type of disruptive change referenced by Schumpeter? If one believes this to be the case, then the manner in which strategic investments are made and resources are allocated is an important issue, particularly when trying to replicate an economic ecosystem that promotes and facilitates disruption.

With an ever changing economic and political environment, institutions of higher education face continual pressure to engage the private sector and become more entrepreneurial. But becoming an entrepreneurial university is part of an evolutionary cycle and occurs as economic development is added to the university's more traditional roles of basic research and teaching. The entrepreneurial university is viewed by some as an extension (natural evolution) of the university's emphasis on economic development (Rothaermel, Agung, & Jiang, 2007).

This desire to become more entrepreneurial often occurs amidst pressure for these institutions to operate under fiscal constraints. Higher education administrators, particularly those in public institutions, can be discouraged from engaging in any activity that could be viewed as increasing costs (Ferguson, 2010). These budgetary constraints may lead to inaction in the area of encouraging entrepreneurial efforts that could lead to increased revenue and job creation. ,

One mechanism that institutions of higher education and communities considering the development of an incubator can employ to mitigate risk and undertake the process of due diligence is the solicitation of a feasibility study (James, 2001). While there is no standard formula for what a feasibility study ought to comprise, the National Business Incubator Association (NBIA) recommends that, at its core, a feasibility study should include a review of the market, assessment of stakeholder buy-in, financial feasibility, and assessment of real estate availability (James, 2001). This article is a comparative review of several feasibility studies and includes an assessment and interpretation of the elements described above and sources of data used in performing the feasibility, determining what elements were included, and assessing which were most beneficial in determining the viability of the incubator.

II. Background

Several key questions must be addressed before any discussion of the viability of a business incubator: What is a business incubator? What services do incubators typically provide? What is the historical role institutions of higher education have played in new venture creation and how has that changed?

In 1959, Charles Manusco & Sons purchased a 90,000 square foot building that was originally constructed in 1882. Unable to utilize the entire space, they opted to subdivided and lease the space to smaller tenants. They named the facility the Batavia Industrial Center. One of the early clients of the facility was a chicken incubator. On occasion, when asked about the activities in the building, Joseph Manusco would quip "we incubate chickens." Since then, facilities similar to the one established by the Manuscos have been referred to as incubators (Barrow, 2001).

Since the 1960s, incubators have grown to service the needs of area entrepreneurs in growing their business. In the 1970s, community leaders and policy makers used the concept of business incubation to develop entrepreneurial strategies to spur economic development in economically depressed areas in the country (Lewis D. , 2001). By the early 1980s, some institutions of higher education saw this movement as an expansion of their traditional mission of teaching, research, and service. Since that time, business incubators have evolved to assist entrepreneurs in the growth of their business enterprise by providing clients with valuable support and services (Lewis, Harper-Anderson, & Molnar, 2011).

A business incubator typically provides start-up companies with rental space, shared office services, and business consulting assistance (Hackett & Dilts, 2004; Essig, 2014). The occupants tend to be early stage companies and require access to technical and financial resources to help control their overhead costs and fuel the growth of their business. Though they are often characterized by a physical location, a business incubator may include virtual components (Lewis, Harper-Anderson, & Molnar, 2011; Essig, 2014). In fact, modern definitions of a business incubator often stress that an incubator is more about the services it provides to early-stage companies, than it is about physical location (Hackett & Dilts, 2004; Essig, 2014; O'Neal, 2005).

During the past 30 years, business incubators have experienced enormous growth world-wide (International

Business Incubator Association, 2015; O'Neal, 2005). From 1980 to 2012, the number of business incubators in the United States has grown from 12 to more than 1,250. According to the International Business Incubator Association (InBIA), which was formerly known as the National Business Incubator Association (NBIA), there are more than 7,000 incubators in existence worldwide (International Business Incubation Association, 2016).

The popularity of business incubators has been fueled by the promise of business success. Several key associations ascertain that businesses that receive incubation have a low failure rate (International Business Incubator Association, 2015; Rogova, 2014). According to the InBIA, only 13 percent of businesses that receive incubation fail (International Business Incubation Association, 2016). In Europe, businesses that receive incubation are equally sustainable. In a 2013 survey conducted by members of the European Business and Innovation Centre Network (EBN), the success rate of incubator clients is 88.3 percent (Rogova, 2014).

Though the first incubator was a for-profit enterprise, roughly 93 percent of all incubators are non-profit (International Business Incubation Association, 2016). Furthermore, a large portion (roughly 32 percent) are housed within an institution of higher education (Todorovic & Suntornpithug, 2008). Apart from creating a pipeline of innovative ideas that can lead to commercialization, university-based business incubators often offer a perfect blend of entrepreneurship, research, and education.

University-based Incubators

The goal of any business incubator is to assist entrepreneurs in developing their business to the point that it leads to jobs being created (Lewis, Harper-Anderson, & Molnar, 2011). Institutions of higher education are often called upon to either serve as the primary operator of the incubators, or as a key partner in their ongoing development (O'Neal, 2005). The presence of a business incubator within a university system is commonplace regardless of international context (Rogova, 2014). These programs often serve as a vehicle to leverage the university's assets, commercialize research, and/or spin-off companies (Rogova, 2014). They have also been found to assist in the evaluation of innovation and promote entrepreneurship (O'Neal, 2005).

Ever since the passage of the Bayh-Dole Act in 1980, universities in the United States have aggressively sought ways to spur innovation and capitalize on scientific and technological breakthroughs resulting from federally sponsored research. Universities view the establishment of an incubator as a way to facilitate the creation of new business enterprises (Rothaermel, Agung, & Jiang, 2007).

University-based incubators have also been found to serve as a catalyst for private sector investments and accelerate the rate of job formation (McAdam & Marlow, 2008; Rogova, 2014; Mian, 1997). They can serve as valuable tool in promoting an "entrepreneurial spirit" that results in new business creation and increased investments in innovation and they can serve as an incentive for high-skilled individuals to reside in the region (Lewis, 2001).

Apart from the creation of a business incubator, this role in spurring economic development has also manifested itself through the creation of research and science parks, the establishment of offices of commercialization and technology transfer, as well as the facilitation of university spin-offs (Rogova, 2014; Alarape, 2007; Baptista, 2008). Youtie and Shapira (2008) have argued that the universities' role in science and technology-based economic development has been central in aiding regional economic development. As universities evolve from simply performing conventional research and education to the promoting of a knowledge hub, they contribute to advancing technological innovation and economic development in their respective region (Youtie & Shapira, 2008).

University-based incubators are unlike a traditional incubator, which provides commodity services (i.e. reduced rent, fax, telephone services, meeting space, etc.). Though these services are important, they do not build organizational value. By capitalizing on the assets of the university, a university-based incubator is able to build valuation through the use of proof of concept centers that validate products and business ideas. The ability to validate a concept can greatly attribute to the firm's ability to generate revenue and secure capital. As such, having a university-based incubator can greatly enhance opportunities for faculty and students, and can be a significant contributor to the region's economic prosperity.

Effectiveness of University-based Business Incubation

University-based business incubators play a key role in this transformation and hub creation. They serve as the place where academic and entrepreneurial strengths merge (Rogova, 2014). Apart from the use of equipment, availability of faculty experts, and access to student interns, the connection to institutions of higher education has also been found to add credibility to the business enterprise (Mian, 1997; O'Neal, 2005; McAdam & Marlow, 2008).

There is strong evidence to support this assertion. In a 1995 study by Coopers and Lybrand, firms with university ties were found to be two-thirds more productive than firms without a university connection (O'Neal, 2005; Coopers and Lybrand, LLP, 1995). Those that used university resources were also found to have 21 percent higher revenues, 32 percent more bank loans, and 23

percent more capital investment, than those that did not use university resources (O'Neal, 2005; Coopers and Lybrand, LLP, 1995). The authors also found that among growth firms, 70 percent were reported to use student interns, 40 percent recruited students upon graduation, and 44 percent contracted with faculty for additional services (O'Neal, 2005; Coopers and Lybrand, LLP, 1995).

In contrast to the seemingly widely held view that incubators have a positive impact in the long-term viability of small business enterprises are studies which question their effectiveness in influencing the survival rate of graduating client. In a review of clients from 178 university affiliated incubators, Amezcua, Grimes, Bradley, & Wiklund, (2013) postulated that an incubator's success in assisting client firms is more a function of an incubators' fit within the broader geographic environment, particularly as it relates to the density of the industry within which their clients operate (Amezcua, et al., 2013).

In a study of five business incubators in Germany, Schwartz (2009) found that the failure rate was higher among firms that graduated from an incubator. Schwartz reviewed 352 businesses that successfully graduated from one of the incubators and found that 105 firms or nearly 30 percent were closed at the time of follow up. Of those, only 10.5 percent closed as a result of a merger or acquisition. The vast majority (87.8 percent) were either liquidated or closed as a result of bankruptcy and had an average survival period of 3.6 years.

Even with evidence that seems to question the effectiveness of business incubators, many policy officials view business incubators as a powerful driver of the United States economy (Business Incubators and Their Role in Job Creation, 2010). Similar to the growing number of business incubators, the desire of local leaders to boost their economies by attracting higher skilled, higher wage jobs, and the rapid growth of the high-tech sector, has resulted in an increase in technology-led business incubators (O'Neal, 2005). As of 2008, there are more than 450 technology incubators in North America assisting early-stage companies (Mayer, 2008).

Despite this rapid growth in the number of incubators, research on business incubation is rather sparse. Most research tends to focus on performance of the incubators and in trying to ascertain their long-term effectiveness (Barrow, 2001; Essig, 2014; Hackett & Dilts, 2004). This often manifests itself in an analysis of the success of incubator graduates, the propensity of graduates to remain in the region, the cost per job created, or the total return on investment (Bureau of Business Research, 2014; Georgia Institute of Technology, 2015; Maryland Technology Enterprise Institue, n.d.; O'Neal, 2005).

Some of the more established university-based incubators such as the Advanced Technology Development Center (ATDC) at Georgia Institute of Technology (1981), the Maryland Technology Enterprise Institute (Mtech) at the University of Maryland (1985), the Austin Technology Incubator (ATI) at the University of Texas at Austin (1989), and the Business Incubator Program (BIP) at the University of Central Florida (1999), have estimated their programs economic impact into the billions of dollars. Since its inception, ATDC companies have raised over $2 billion in capital; Mtech has had a $29.4 billion economic impact; and BIP companies have had a $2.5 billion economic impact (Georgia Institute of Technology, 2015; Maryland, 2015; Burnett, 2014). For the 10 year period spanning 2003-2012, ATI companies have added 6,520 jobs to the Texas economy (Bureau of Business Research, 2014). Often times, these and other highly regarded and established programs are used as models to demonstrate best practices and held as examples of how university-based incubator programs can successfully spur the regional economy and promote economic growth (Claggett Wolfe Associates, 2003; Bureau of Business Research and Economic Development, 2012).

Though monitoring the performance of existing incubators is an important element in assessing the continued support for incubator activities, given that as many as 85 percent of business incubators are publically supported (Mayer, 2008), an assessment prior to the formation of a business incubator can help mitigate public risk (James, 2001). What is often missing is a lack of understanding and appreciation for the dynamics that led to the decision to create these programs. There is little appreciation and research that views the community dynamics that existed at the time and the process by which the university-based incubator was deemed viable.

In order to assist economic development and government officials in determining how to invest scarce resources, communities often solicit the development of a feasibility assessment. Often this study is a service that is contracted by the entity proposing to operate the facility or one with a financial stake in its future development. The performance of a feasibility assessment is often regarded as a process of due diligence in the potential development of an incubator (Claggett Wolfe Associates, 2003; James, 2001). Though regarded as a valuable step in assessing the viability of a business incubator, little research exist to determine the factors that are deemed necessary for conditions to exist for the probability of success to be maximized, nor does information exist regarding the role the feasibility study played in the future development of the incubator.

III. Method

This article is a review of technical assessments that were conducted to determine the viability of establishing a business incubator. It is an attempt to identify common elements of incubator feasibility studies and highlight what information was deemed relevant and how the study was conducted. The purpose is to provide university economic development administrators with a comprehensive review of the potential value of commissioning a feasibility study when considering launching an incubator.

The author reviewed seven incubator feasibility studies that were conducted over a ten year period, 2001 to 2012. The studies were performed for Bayview, CA (2001), Tupelo, MS (2001), Lane County, OR (2003), Wisconsin Rapids, WI (2005), Cumberland, TN (2007), Washington, DC (2009), and Statesboro, GA (2012). Three were selected for in-depth discussion: Lane County, Cumberland, and Washington, DC. Criteria for selecting these three are discussed below.

Each of the seven studies was commissioned by a sponsoring agency, which allocated resources to have the study performed. This allocation was viewed to signal the agency's commitment to explore and possibly facilitate the creation of a potential incubator. A clear indication of a financial commitment to sponsor the study was an important determining factor in the selection of the studies. This selection was made after conducting an Internet search that yielded over a dozen results. The other studies were not chosen for discussion because an allocation of resources to have the study performed could not be determined.

In reviewing the seven feasibility studies, several thematic areas emerged. First, the manner in which the community was engaged was heavily emphasized. Each of the studies utilized a method by which input was solicited and recorded. This was commonly done through a series of interviews with community stakeholders, coordinating and conducting focus groups, and/or community-wide surveys. Second, each study contained an analysis of market conditions to aid in determining the focus of the potential incubator. In many cases, a thorough review and analysis of secondary data was performed to identify industry trends and labor market conditions. Third, there was a discussion of the method or process by which engagement of a local institution of higher education was determined. Whether to serve as the primary operator of the incubator, to assist in the commercialization of research, or to serve as an extension of business outreach services, the local college or university was viewed as a key component in the future development of the incubator. Fourth, most studies contained an operational assessment that discussed recommended services, the solicitation of program partners and financial considerations for ongoing staffing of the incubator. In many cases, the financial considerations extended to the initial construction and development costs. Fifth, most of the cases also discussed the necessary facility requirements and conducted a site assessment of one or more potential locations. Finally, in half of the cases a discussion of the future economic impact was addressed.

Though the focus of this paper is on the feasibility assessment, the author does perform a review of public domain to determine if a business incubator was ultimately launched. This cursory review was intended to answer, if launched, how long after the study was performed did the facility open? What services are available to incubator clients? And, what is the nature of the connection to the local institution of higher education?

Because this article is primarily focused on understanding the dynamics of the feasibility study and understanding the elements that influence the decision to launch, limited information was collected and analyzed regarding the ultimate performance of the incubator. This can be a topic of future research.

IV. Community Assessments

Though the author reviewed seven studies, for the purpose of this section, only three (Washington, DC, Lane County, OR, and Cumberland, TN) are discussed in more detail. These studies were also selected upon completion of an Internet search and were picked based on their geographic and demographic diversity.

It was the author's belief that these three studies effectively explore the potential role an institution of higher education can play in the development of an incubator. For instance, the Lane County, OR, was performed for a flagship university, the University of Oregon, while the Cumberland, TN, study was performed for the Roane State Community College. In the study for Washington, DC, it did not indicate the involvement of a specific college or university operator of the potential facility. In that study, the emphasis was for an institution of higher education to play a supporting role. In each case, the study was performed by an independent consulting firm.

These studies also represent a broad cross-section of host communities, both in terms of geographic location and population. From the Pacific Northwest to the southeastern United States, and from a small southern city of less than 60,000 residents to the nation's capital and central city in the 7th largest metropolitan statistical area, these studies represent array of communities interested in launching a business incubator.

The studies were completed between 2003 and 2009. In each case, the development of an incubator (physical or virtual) was recommended. Each study went on to make

suggestions as to focus areas, caution against market forces and outline potential scope of services, yet each yielded very different results. Though not a primary focus area, this time frame was selected to enable the author the opportunity to perform a cursory review to determine whether an incubator as proposed was launched within the studied area. The study performed for Cumberland, TN resulted in the launching of a new incubator, while the one for Lane County, OR enabled the expansion of programming for an existing incubator. In contrast, as of this date, the author has not been able to identify a discernible impact from the Washington, DC study.

The other four studies reviewed (Bayview, CA, Tupelo, MS, Statesboro, GA and Wisconsin Rapid, WI) were not considered for an in-depth critique because the author deemed that their inclusion would only marginally add to the discussion and appear duplicitous. All four were for communities of a similar population size and maintained key elements found in the aforementioned studies. The information from all seven studies, however, is included in the discussion of key attributes. An overview of the three analyzed studies follows.

Community 1 – Washington, DC (pop. 658,893)

The first feasibility study reviewed is for a potential technology incubator in Washington, DC. In a review of the employment landscape, the study points to universities in Washington, DC as the city's largest nongovernmental employer. As such, the authors of the feasibility study recognize the need for initiatives that strengthen the connection between institutions of higher education and other industry sectors in the area. The establishment of a technology business incubator is viewed as a mechanism for realizing future economic benefits that could be derived from commercializing the research activity already taking place (The Emerging Technology Consortium and Angle Technology Group, 2009).

As of the date the study was performed (2009), none of the six universities with their primary campus in Washington, DC (i.e. Georgetown University, American University, George Washington University, Howard University, Catholic University, and the University of the District of Columbia) operated a business incubator. There were, however, incubators in existence run by private entities, such as an investment company, nonprofit entity, and a faith-based organization (The Emerging Technology Consortium and Angle Technology Group, 2009).

The research activities of these six institutions were reviewed and assessed for their relevance for incubation. Research and development expenditures as reported by the National Science Foundation were reported for each institution and by core research area. The study also explored technology transfer activities and included a review of patent applications, the number of patents issued, and any reported licensing income. A review of other connections to business development programs and venture capital investments was also presented.

This study performed a review of the competitive landscape that looked well beyond the immediate borders of the city. The study authors highlight the incubation activity within the state of Maryland and northern area of Virginia. This included the review of 18 incubator programs (The Emerging Technology Consortium and Angle Technology Group, 2009). The review of these existing programs was performed to determine best practices, as well as an analysis of the competitive landscape. Information was gathered to assess the level of expected activity by recording the number of inquiries each incubator received per month, the rejection rate and reason for rejection into the incubator, as well as identified the most valuable service each reported to provide to their business clients. This information, however, is not used to serve as a proxy for the level of activity a potential incubator could expect in Washington, DC.

The study also heavily weighs employment projections, particularly in targeted industries. The data is collected from secondary sources and is presented for two markets, a primary market that is comprised of the city itself, and a secondary market that extends the boundary of analysis to a 60-mile radius of the city.

The study emphasizes a sector focus, with particular attention placed on the level of knowledge workers. Knowledge workers were defined as professional services, information technology, healthcare, education and research, and media arts and design. This information is used to perform a review of competitive forces impacting success. The projected growth of information technology and professional service companies is argued as a vehicle to serve as the cornerstone of a tech cluster and a factor in the ability to position Washington, DC as the center of the tech industry.

The study includes a review of demand for office space and assessment of the amount of rentable space, vacancy rates, amount of space under construction, and average lease rate per square foot for targeted areas within the city. This led to an exploration of space requirements and recommended a phased approach to establishing an incubator. In performing a site assessment, the study performs a broad review of key target areas then looks at four specific near-term site possibilities and one long-term option. Each option would require that the property be leased by an incubator operator and sublet to business clients. The review takes into consideration amenities such as the availability of parking, dining options, and public transportation.

Five year financial projections were prepared based on an assumed 40 percent vacancy rate in year one and 10 percent thereafter. A 4.5 percent annual increase in rental payments is also assumed, along with an average tenancy of three years. In order for the facility to cover expenses, it is assumed that a city operating grant would be provided in the amounts of $450,000, $300,000, $250,000, $200,000 and $150,000 for years one through five, respectively. This equates to a high of 51 percent of the total revenue in year one to just over 10 percent in year five. No indication is made for the grant subsequent to year five (The Emerging Technology Consortium and Angle Technology Group, 2009).

An economic impact analysis is performed that uses one job for every 300 square feet of office space as a determining factor in direct jobs (The Emerging Technology Consortium and Angle Technology Group, 2009). This information is processed through an input/output modeling software (i.e. IMPLAN) that is used to estimate the number of direct, indirect, and induced impacts in terms of jobs and dollars. Within three years of completion, the incubator is expected to contribute to the creation of 107 jobs and increase the total economic activity of the region by $16.1 million (The Emerging Technology Consortium and Angle Technology Group, 2009).

In addition to interviews with key stakeholders, two surveys were sent via email to subscribers of an electronic newsletter that targeted entrepreneurs in the Washington, DC area. The first was sent to 1,200 individuals, while the second was sent to 4,000. The surveys received a 2.5 percent and 1.4 percent response rate, respectively (The Emerging Technology Consortium and Angle Technology Group, 2009). The information collected was used to determine the most needed services by potential incubator clients. Mentoring and additional education options ranked high among respondents.

Toward the end of the report, the study also includes a very general discussion of incubators. The importance of a strong stakeholder base is also emphasized, as is the value of a strong network of entrepreneurial programs that can help market and support the incubator program.

Ultimately, the study recommends that the incubator be developed in two phases with each phase requiring the build out of 12,000 square feet. In order to accommodate the study's recommendation, a facility would have to be identified that would enable the incubator to undertake phase two expansion as the initial phase becomes fully occupied. The study also recommends that the facility be initially staffed by two-and-a-half full-time equivalent personnel. Additional personnel could be added as the facility expands.

Community 2- Lane County, OR (pop. 355,661)

Claggett Wolfe Associates (2003) conducted a study for a potential incubator in Lane County, OR. Unlike the feasibility study performed for Washington, DC, where six educational options were reviewed, the Lane County study clearly indicates the desire to have the University of Oregon serve as the operator of the incubator. The study was conducted in 2003, and evaluates the opportunity to establish an incubator to assist in the transferring of technology from the university.

As with the previous study, the authors of the Lane County study perform a series of interviews with area stakeholders. There is, however, a broader review of target industries. In this case, the technology, manufacturing, specialty foods/agri-business, and the arts sectors are considered. For each sector presented, the study seeks to identify challenges and opportunities that could impact the region's ability to support a dedicated business incubator.

The authors use vignettes of highly regarded incubator programs throughout the report. The vignettes are for programs in Atlanta, GA; Denver, CO; Birmingham, AL; and New Orleans, LA. Three of the four programs are referred to as InBIA award recipients. The report summarizes the services each provides, as well as cumulative performance or examples of specific business successes.

The study also highlights the state's performance in knowledge economy indicators, particularly the number of business starts, Small Business Innovation Research and Small Business Technology Transfer Research (SBIR/STTR) awards, venture capital investments, and industry research and development expenditures. For comparative purposes, this information is reported per 100,000 population or per capita. A detailed review of SBIR/STTR and patent activities for the immediate area is also included. The SBIR/STTR data is compiled from an SBA database and spans nine years. The patent activity is collected from the U.S. Patent and Trademark Office and covers a five year period (Claggett Wolfe Associates, 2003).

Like in the Washington, DC, study, secondary data is analyzed and presented for two markets. The primary market is Lane County and the secondary market is a 60-mile radius (Claggett Wolfe Associates, 2003). Local data related to the employment base and the number of business firms, particularly sole proprietors, is included. University of Oregon research spending by discipline, the number of university inventions, amount of licensing income and number of startups over a three year period is reported (Claggett Wolfe Associates, 2003).

But the analysis related to research and development generators is not limited to the University of Oregon. The activities of other institutions of higher education, federal

laboratories, and corporate researchers are also reviewed. Similar to Washington, DC, this study augments data collected from secondary sources with a series of individual interviews to develop a recommended course of action.

A discussion of the history of business incubators and their typical services is included, however, a specific organizational structure, financial analysis, and site assessments are not included. The study does recommend the development of a formal business plan. As such, a separate business plan was performed by KJ Smith Associates (2004) to outline the organizational structure and cost of the proposed incubator. The report was based on the previous study and funded through the Lane County Economic Development Fund.

The business plan reviewed three site options; expand the existing Innovation Center, lease/purchase a new facility, or incorporate the incubator into a planned nanotechnology research center. Ultimately the authors proposed that a new 15,000 square foot facility be constructed to provide for greater control and long-term stability of the program. The cost for the facility was estimated to include $2.3 million in construction, $170,000 in one-time capital outlays and an annual operating budget between $237,300 and $270,171 (KJ Smith Associates, 2004).

Similar to the previous study, the incubator is expected to operate at a loss. The revenue would only cover 43 percent of expenses in year one and scale to 75 percent of expenses by year five. There is no indication for how the shortfall in revenue will be covered. It was also projected that the facility would be opened within two and a half years of the studies completion (KJ Smith Associates, 2004).

Community 3 – Cumberland, TN (pop. 57,492)

Though the feasibility study for Cumberland, TN was completed by Stewart, Wright & Associates, LLC in 2007, the process started in December 2005 with a meeting of key stakeholder groups. At that meeting, representatives from seven entities including the city, county, school system, chamber of commerce, university, community college and local technology center, signed a memorandum of agreement to work to establish a business incubator in Cumberland (Stewart, Wright & Associates, LLC, 2007). Similar to the other studies mentioned, an independent consultant was utilized. The targeted operator was Roane State Community College.

Similar to other studies, secondary sources are utilized and augmented with over 40 individual interviews. A key distinction is that that secondary data is weighted and totaled utilizing a methodology established in a previous study by Stacey and Associates (Stewart, Wright & Associates, LLC, 2007; Stacey and Associates, 2001).

Fifteen indicators were analyzed, discussed, tabulated, and labeled as success factor values. A numeric value is assigned to certain demographic and economic indicators based on indicator performance. For instance, if private employment growth was positive over last 24 months, the researchers assigned a numerical value of two. If employment was flat, then one point was assigned. And if employment growth was negative then no points were assigned. Table 1 includes a breakdown of the point assignments.

The rating scale was used to evaluate a community's readiness for a business incubator. This total score is derived from each of the individual indicators. This total is then used to determine if the county is ready for a business incubator. Outlined below is the scaling for these results.

If the responses total more than 26, then Stacey & Associates argued that the necessary conditions exist to support a full service incubator. If 19 to 25 points are compiled, then an argument can be made for a satellite facility connected to a larger hub or as a hub connected to other satellite facilities. If 14 to 18 points are tabulated, then the community would be well suited for a satellite facility only. And if the total is 13 or less, then inadequate elements exist to support an incubator (Stacey and Associates, 2001).

In case of Cumberland, TN, the total value of 32 was calculated. This quantitative analysis was augmented by more than 45 interviews with government and political leaders, academic experts, business professions and nonprofit and school system officials. In addition, 550 surveys were mailed to area businesses and roughly 100 responses were received for a response rate of 18 percent. This information was used to gauge attitudes about the community's business climate and probability to utilize potential services (Stewart, Wright & Associates, LLC, 2007).

The site assessment assumes donated land for construction, but indicates that a survey of existing parcels was performed. However, no information was presented to support that additional buildings were reviewed.

Table 1. Success Factors and Numerical Value

Population Trends	Annual growth rate above state	2
	Annual growth rate below state but positive	1
	Annual growth rate negative	0
New Non-Farm Proprietors	Average more than 3 per month	3
	Average more than 2 but less than 3	2
	Average more than 1 but less than 2	1
	Average more less than 1 per month	0
New Business by Founding Year	Average more than 4 per month	3
	Average more than 2 but less than 4	2
	Average more than 1 but less than 2	1
	Average less than 1 per month	0
Total Retail Sales	Positive Trend	1
	Flat Trend or Negative Trend	0
Bank Deposits	Positive Trend	1
	Negative Trend	0
Total Private Employment	2 year Positive Trend	2
	Stable	1
	Negative	0
Manufacturing Units	100 or more units	3
	99 to 51 units	2
	50 to 26 units	1
	25 to 0 units	0
Industrial Activity	1 or more new location or expansions per year	1
Technical Core	Ratio of technical units to business units 1:10	3
	1:11 – 1:15	2
	1:16 – 1:20	1
	1:21 or more	0
Higher Education	4-Year College	3
	2-Year College	2
	Technical School	1
Industrial Development Organization (IDO)	Operating in area	1
Chamber of Commerce	Operating in area	2
Incubator Activity	Operating Incubator	3
	Under Development	2
S.B.D.C.	Access to nearby S.B.D.C.	1
Leadership Attitude	Very Positive	3
	Positive	2
	Receptive	1
	Non-Receptive	0

There is a proposed organizational structure and discussion of funding requirements for construction and three years of monthly operating expenses for the proposed incubator. The recommended structure is that of either an independent nonprofit 501(c) 3 corporation or an entity directly associated with the community college. In either case, the report outlines the anticipated cost for the land and construction of the facility to be just over $1.73 million. The study also identified $1.74 million in potential funding, of which, 76 percent would be in the form of

government aid (Stewart, Wright & Associates, LLC, 2007).

Unlike previous studies which projected cash flows for a five year period, the operating cash flows for Cumberland were performed for only three years. In each forecasted year, the facility was expected to require an annual subsidy of 44, 33 and 25 percent of total expenses. This amount ranged from $78,192 in year one to $40,171 in year three (Stewart, Wright & Associates, LLC, 2007).

V. Key Attributes

Though the three studies discussed varied significantly in their approach and structure, each had several common elements. For instance, each contained an element of community engagement (i.e. interviews, surveys, charrettes, etc.). In each case, this was used to gage public support for an incubator and aid in identifying areas in which the proposed incubator could be of greatest value to the entrepreneurial community. Each also stated that a subsidy would be required to initiate the launch of the facility. Though the actual amount of the year one subsidies varied considerably (from a low of $78,192 to a high of $450,000) each accounted for just over half the total projected operating expenses. In each case, the subsidy was projected to phase out over three to five years and was based on an increase in the occupancy rate of the facility. When all seven studies are reviewed, patterns in the structure of the studies and similarities in their findings become more evident. The following discussion includes a review of all seven studies.

Five of the analyzed reports included a history of business incubators and discussion of the type of services typically offered. Providing a historical and contextual overview appears to help clarify any ambiguity surrounding the potential role of a business incubator. Take for instance the case of Wisconsin Rapids, WI. In their feasibility study no clear review or discussion of the incubator history or general overview of services was included. This is despite an interview comment that cited "confusion about what an incubator is and how it works," (p. 10) (Northstar Economics, Inc., 2005). Providing an overview of the business incubation industry, proves to be beneficial in setting the stage and creating a common platform to begin discussions about the broader concept and specific attributes that a potential incubator could bring to the analyzed area.

Apart from a general discussion of the business incubator concept, many of the studies reviewed shared common attributes. Table 2 highlights certain attributes found in the three studies discussed, as well as the four additional studies that were reviewed but deemed not suitable for detailed discussion in this article.

Table 2. Comparative Attributes

Community	2013 Population	IHE Operator	Community	Industry Analysis	Impact	Operation Review	Financial Analysis	Sites	Result
Washington, DC	658,893	Y	Interviews and survey	Tech	Y	Y	Y	Y	UNK
Lane County, OR	355,661	Y	Interviews	Tech, Manufacturing, Argi-Business, & Art	N	N	N	N	Expanded Existing Program
Cumberland County, TN	57,492	Y	Interviews and survey	N	N	Y	Y	Y	Opened 2011
Bayview, CA	35,890	Y	Charrette	Environmental	N	N	Y	Y	UNK
Tupelo, MS	35,827	N	N	N	Y	Y	Y	Y	Opened 2006
Statesboro, GA	29,937	Y	Planning Retreat	Tech, Aerospace, Forest Products, & Manufacturing	Y	Y	Y	Y	Launched Virtual, Physical to open in 2016
Wisconsin Rapids, WI	18,039	N	Surveys	N	N	N	Y	Y	Launched Virtual

Among the attributes consistently reviewed in the studies is an element of community engagement. Community feedback, in the form of charrettes, planning retreats, interviews, and surveys (mail or electronic) are typically employed as a means of soliciting community feedback. This is an important process in not only assessing the strength of the stakeholder base, but also in educating the community about the prospect of developing a business incubator.

All seven studies supported their recommendations with secondary data. This data was collected primarily from state and federal sources. The ensuing analysis was based primarily on growth trends over a three to five year period. Data such as the number of employees by industry, the number of business establishments by firm size, and the number of new business starts by sector was used to assess the growth and activity of certain industry sectors. In some cases, various indicators where collected and weighted based on their perceived relevance to the establishment of a business incubator. Information was also compiled to determine whether sufficient research activity existed to support an incubator targeting a specific sector. This determination often came from a review of university research expenditures, as well as activities in corporate research facilities, federal labs or large nonprofit research entities. Extending this review to entities other than the proposed university-based incubator operator, can help convey the importance of connecting the incubator with existing regional assets. This can serve to maximize opportunities for innovation and strengthen the region's core clusters. This connection to research that can lend itself to commercialization opportunities within the context of a larger industry cluster may present the greatest opportunity to develop programs and/or services that stand to disrupt the local economy in a manner envisioned by Schumpeter.

A discussion regarding the proposed operational structure is sometimes used to help articulate the program and formulate the concept. How the incubator will look and function helps outline the possible cost to develop and staff the program. A discussion and forecast of cost was presented for both the construction and the operation of the incubator. When present, operational costs were consistently presented as monthly expenses spanning over a three year period.

Since each feasibility study viewed the establishment of a business incubator in terms of a physical location, a site assessment proved a valuable component. When performed, this included a review of possible locations based on an established list of space requirements. Some studies included a possible layout, and based cost estimates on the renovation or construction of the specific site reviewed.

In some cases, an economic impact estimate was presented. This was often performed using IMPLAN, however in one case a simplified multiplier was applied to client projected revenues. The purpose of the impact analysis was to communicate to stakeholders the future direction and vision for the facility and to encourage any funds used to support the program to be viewed as an investment, as opposed to a grant.

Upon conducting this review, the author determined that of the seven proposed facilities, four were successfully launched (i.e. virtual or physical) and one incubator expanded its program offerings (H. Hanson, personal communication, July 2, 2015; M. Wygle, personal communication, July 2, 2015). The information regarding the other two programs was inconclusive. Of those that opened, an average of five years passed between the completion of the feasibility study and the official grand opening.

VI. Discussion

Each feasibility study utilized secondary data to indicate whether sufficient demand was present to support the establishment of a business incubator. However, studies have postulated that a region's capacity and economy are poor predictors of an incubator's success (Lewis, Harper-Anderson, & Molnar, 2011). The viability and long-term success of a business incubator is heavily influenced by the skills of the operator and value clients place on those skills and services, as well as the linkages established to networks that support entrepreneurial activity (O'Neal, 2005; Lockett & Wright, 2005). Though these success attributes are very difficult to quantify and predict, there is empirical evidence to support a correlation between best practices and incubator success (Lewis, Harper-Anderson, & Molnar, 2011).

Whether or not a feasibility study serves as a tool in predicting an incubator's long-term viability and success is a subject for continued research. What is clear is that if properly performed, they can serve as an important element in the due diligence process.

The fact that all seven studies ultimately recommended the establishment of an incubator could be a reflection that the mere agreement to allocate funding and undertake the feasibility study is an indication that there is sufficient community support to launch a business incubator. The study can have tangible value such as assessing a location and developing a firm understanding of all the necessary parameters and expectations, but it is the intangible value of serving as a unifying voice that may be its greatest attribute. When performed with rigor, the feasibility study becomes the sheet of music by which incubator

stakeholders can sing. The leadership that commissioned the study can use it to ensure that variables such as location, funding, operational expenses, and outcome are effectively communicated to various stakeholders. In essence, the feasibility study becomes the instrument for formalizing commitments such as funding, staffing and location, and articulates the expectations of all parties involved.

A feasibility study is not just to assess the viability of the program, but to educate stakeholders and build support for the incubator. The feasibility study, itself, is simply a catalyst for launching the program. Though the discussion of an incubator in Statesboro, GA took center stage at the February 2012 Statesboro-Bulloch Chamber of Commerce Economic Development Retreat, discussions between Georgia Southern University, city and county leaders, and vested community stakeholders dated back to 2006 (Bureau of Business Research and Economic Development, 2012). It was not until a feasibility study was performed that clarity of the program was established and resources committed. Community leaders utilized the study to secure more than $3 million in federal, state, and local support (Bureau of Business Research and Economic Development, 2015).

In Lane County, though no new incubator was launched, the University of Oregon did utilize the study to secure additional investments and funding for equipment. The study also assisted an existing incubator in evolving from a general purpose business incubator to one focused on assisting start-ups in the technology sector (M. Wygle, personal communication, July 2, 2015).

VII. Conclusions

Since the early 1980s, college and university-based incubators continue to serve as valuable mechanisms for promoting and creating innovation and fostering greater collaboration between industry and academia. As institutions of higher education continue to seek an expanded role in supporting the development of early stage companies, the development of business incubators will likely continue to factor into their plans. Yet, in order to have the level of disruptive change described by Schumpeter, incubators must offer more than just operating space and general business support services and they must offer more than just a place to develop new ideas. In Schumpeter's view, it is not basic discovery but the diffusion of that discovery that has the most substantial impact in terms of economic growth, employment and investment. He places the entrepreneur and their ability to execute central to the economic gains that result from innovation (Proctor, 2015; Schumpeter, 1934).

The ability to aid the entrepreneur in execution ought to be the central premise to any business incubator. An incubator ought to support the type of activities and research that not only facilitates the creation of new products and new business processes, but fosters their development. This requires more than just a review of standard economic indicators. Feasibility studies ought to include a review of research activities in key industry clusters and gaps in services that, if filled, might enable the creation of businesses within those clusters to develop.

The role of the university-based incubator in facilitating technology transfer and commercialization, creating opportunities that lead to new skills and new job opportunities, and fueling the continual need for skilled labor will aid academia in taking sponsored research and applying it to the broader economic context. Despite their role in assessing an incubator's viability, the greatest benefit of a feasibility study may not be the final recommendation or analysis of data, but rather the assembling of stakeholders and establishing common expectations.

Though certain common elements were found in the review of the feasibility studies, limited information was presented to assess whether they served as a predictor of an incubators success. They did, however, appear to serve as a valuable unifying voice for a program that will undoubtedly require the support of multiple stakeholders in order to be successful. Through the process of constructing a feasibility study, stakeholders ought to receive a clear understanding of what it will take to develop, create, operate, and sustain a business incubator. This clarity will enable any institution of higher education that is charged with operating the program to gauge whether the climate truly exist to support the incubator's long-term success.

References

Acs, Z. J., & Audretsch, D. B. (1991). R&D, firm size and innovative activity. In Z. J. Acs, & D. B. Audretsch, *Innovation and Technological Change: An International Comparison* (pp. 39-59). USA: The University of Michigan Press.

Alarape, A. A. (2007). Entrepreneurship programs, operational efficiency and growth of small businesses. *Journal of Enterprising Communities: People and Places in the Global Economy, 1*(3), 222-239.

America's Small Business Development Center. (2015, June 20). *Our History - Celebrating 35 Years*. Retrieved from ASBDC Web site: http://americassbdc.org/about-us/history/

Amezcua, A. S., Grimes, M. G., Bradley, S. W., & Wiklund, J. (2013). Organizational Sponsorship and Founding Environments: A contingency view on the survival of business-incubated firms, 1994-2007. *Academy of Management Journal, 56*(6), 1628-1654.

Association, N. B. (2015, 6 20). *Latest NBIA News*. Retrieved from NBIA Web site: http://www.nbia.org/about/press-

releases/2013/08/03/nbia-announces-latest-soft-landings-designees-program-recognizes-incubators-that-help-companies-reach-beyond-national-borders

Audretsch, D. B. (1995). *Innovation and Industry Evolution.* Cambridge, MA: MIT Press.

Audretsch, D. B. (2002). The Dynamic Role of Small Firms: Evidence from the U.S. *Small Business Economics, 18*(1-3), 13-40.

Baptista, R. ,. (2008). Entrepreneurship, regional development and job creation: the case of Portugal. *Small Business Economics*, 4-58.

Barrow, C. (2001). *Incubators: A realist's guide to the world's new business accelerators.* Chichester, UK: John Wiley & Sons, Ltd.

Birch, D. (1987). *Job Creation in America.* New York: The Free Press.

Borich, T. O. (1994). Collaboration: A Different Strategy for Rural Economic Development. *Economic Development Review*, 18-21.

Bureau of Business Research. (2014). *The Economic Impact of Austin Technology Incubator Alumni Companies on Travis County, 2003-2012.* Austin: The University of Texas at Austin.

Bureau of Business Research and Economic Development. (2012). *Statesboro Incubator and Fab Lab Feasibility Study.* Statesboro: Georgia Soouthern University.

Bureau of Business Research and Economic Development. (2015). *Georgia Southern Incubator/Fab Lab: EDA Update.* Statesboro: Georgia Southern University.

Burnett, R. (2014, October 14). Incubator boasts 3,600 jobs in 15 years. *Orlando Sentinel*. Orlando, FL, USA. Retrieved from http://www.orlandosentinel.com/business/os-cfb-tech-incubator-impact-1006-20141005-story.html

Carland, J. W. (1984). Differentiating Entepreneurs from Small Business Owners - a Conceptualization. *Academy of Management Review*, 9(2), 354-359.

Claggett Wolfe Associates. (2003). *Market Feasibility Study for Business Incubation Opportunities in Lane County, Oregon.* Lane County Business Incubator Group and the University of Oregon.

Coopers and Lybrand, LLP. (1995). *Growth Companies with University Ties Have Productivity Rates Almost Two-thirds Higher Than Peers.* London: TrendSetter Barometter.

Craig, B. R. (2008). Credit market failure intervention: Do government sponsored small business credit programs enrich poorer areas? *Small Business Economics*, 30(4), 345-360.

Davis, S. J. (1992). Gross Job Creation, Gross Job Destruction, and Employment Reallocation. *Quarterly Journal of Economics*, 107(3), 819-863.

Davis, S. J. (1996). Small business and job creation: Dissecting the myth and reassessing the facts (Reprinted from Labor Markets, Emplyment Policy & Job Creation, 1994). *Small Business Economics*, 8(4), 297-315.

Environmental Finance Center Region IX. (2001). *Bayview Incubator Feasibility Study and Proposal.* California Urban Research and Education Center.

Essig, L. (2014). Ownership, Failure, and Experience: Goals and Evaluation Metrics of University-Based Arts Venture Incubators. *Entrepreneurial Research Journal, 4*(1), 117-135.

European Union Regional Policy. (2010). *The Smart Guide to Innovation-Based Incubators (IBI).* Luxembourg: Publications Office of the European Union. Retrieved from http://ebn.be/downloads/innovation_incubator.pdf

Ferguson, J. (2010, November 9). Business Incubator to Expand? *Arizona Daily Sun*.

Garmise, S., Nourik, S., & Thorstensen, E. (2008). *Forty Years of Urban Economic Development: A Retrospective.* Washinton, DC: International Economic Development Council.

Georgia Institute of Technology. (2015, June 30). *Advanced Technology Development Center*. Retrieved from Enterprise Innovation Institute: http://innovate.gatech.edu/programs/advanced-technology-development-center-atdc/

Greenwood, J. (2014). *Incubator Feasibility Studies: A White Paper Prepared for the National Business Incubation Association.* Sanibel, FL: Greenwood Consulting Group, Inc. Retrieved from http://static1.squarespace.com/static/53ce9643e4b03157ad2a3452/t/5405e6eee4b079634bb014f5/1422912640166/NBIA+Feasib+white+paper+draft+put+on+GCGIwebsite+0914.pdf

Hackett, S., & Dilts, D. (2004). A Systematic Review of Business Incubation Research. *Journal of Technology Transfer, 29*(1), 55-82.

Holloway, S. S., & Sebastiao, H. J. (2010). The Role of Business Model Innovation in the Emergence of Markets: A Missing Dimension of Entrepreneurial Strategy? *Journal of Strategic Innovation and Sustainability, 6*(4), 86-100.

James, C. (2001). *Let's get feasible: A feasibility study answers key questions that predict success.* Athens: National Business Incubation Association.

Lefebvre, L., & Lefebvre, E. (1993). Competitive Positioning and Innovative Efforts in SMES. *Small Business Economics, 5*(4), 297-305.

LeRoy, G., Tarczynska, K., McIllvaine, l., Cafas, T., & Mattera, P. (2013). *The Job Creation Shell Game: Ending the Wasterful Practice of Subsidizing Companies that Move Jobs From One State to Another.* Washington, DC: Good Jobs First.

Lewis, D. (2001). *Does Technology Incubation Work? A Critical Review.* Washington, DC: U.S. Department of Commerce Economic Development Administration.

Lewis, D. A., Harper-Anderson, E., & Molnar, L. A. (2011). *Incubating Success: Incubation Best Practices That Lead to Successful New Ventures.* Washington, DC: U.S. Department of Commerce Economic Development Administration.

Li, W. (2014). The Innovation and Revolution Influenced by 3D Printing Technology in the Digital Era. *Applied Mechanics and Materials, 687-691*, 52-55.

Lichtenstein, G., & Lyons, T. (2006). Managing the Community's Pipeline of Entrepreneurs and Enterprises: New Way of Thinking about Business Assets. *Economic Development Quarterly, 20*(4), 377.

Ling, L., & Yi, Y. (2015). 3D printing technology enhances small enterprises impprovement opportunities. *Applied Mechanics and Materials, 741*, 759-762.

Lockett, A., & Wright, M. (2005). Resources, capabilities, risk capital and the creation of university spin-out companies. *Research Policy, 34*, 1043-1057.

Malecki, E. (1994). Entrepreneurship in Regional and Local Development. *International Regional Science Review, 16*(1-2), 119-153.

Maryland, U. o. (2015, June 30). *Mtech*. Retrieved from Maryland Technology Enterprise Institue (Mtech) 2012 Impact: http://www.mtech.umd.edu/news/impact/#highlights

Mattare, M., Ashley-Cotleur, C., & Masciocchi, C. (2012). A New Small City Business Incubator: A Business Community;s Attitudes and Desired Services. *Journal of Strategic Innovation and Sustainability, 8*(1), 46-56.

Mayer, K. (2008, June 30). Technology/R&D. *Technology and Trade Development*. Retrieved from http://www.tradeandindustrydev.com/industry/technology-rd/adapting-technology-incubator-model-meet-local-development-demands-527

McAdam, M., & Marlow, S. (2008). A preliminary investigation into networking activities within the university incubator. *International Journal of Entrepreneurial Behavior & Research, 14*(4), 219-241.

McKinsey & Company. (2012). *Online and upcoming: The Internet's impact on aspiring countries*. San Francisco: McKinsey & Company.

McKinsey Global Institute. (2013). *Disruptive technologies: Advances that will transform life, business, and the global economy*. Washington D.C.: McKinsey & Company.

McQuaid, R. (2002). Entrepreneurship and Regional Development Policies. Edinburgh, UK: Employment Research Institute, Napier University.

Mian, S. (1997). Assessing and Managing the University Technology Business Incubator: An Integrative Framework. *Journal of Business Venturing, 12*, 251-285.

Mt. Auburn Associates, Inc. (2001). *An Evaluation of EDA's University Center Program*. Washington, DC: U.S. Department of Commerce Economic Development Administration .

National Business Incubation Association. (2006). *State of the Business Incubator Industry*. Athens, OH: NBIA.

National Business Incubation Association. (2015, July 2). *Business Incubation FAQs*. Retrieved from NBIA Web site: http://www.nbia.org/resources/business-incubation-faq

Northstar Economics, Inc. (2005). *Heart of Wisconsin Incubator Feasibility Study*. Heart of Wisconsin Business & Economic Alliance.

O'Neal, T. (2005, September). Evolving a Successful University-Based Incubator: Lessons Learned From the UCF Technology Incubator. *Engineering Management Journal, 17*(3).

Proctor, T. (2015). The potential which may lie in discarded, undeveloped or overlooked ideas. *Journal of Management History, 21*(3), 328-344.

Representatives, U. H. (2010, March 17). Full Committee Hearing on Business Incubators and Their Role in Job Creation. Doc. No. 111-060. Washington, DC, USA: U.S. Government Printing Office. Retrieved 9 11, 2015, from http://www.gpo.gov/fdsys/pkg/CHRG-111hhrg55460/html/CHRG-111hhrg55460.htm

Rogova, E. (2014). The effectiveness of business incubaotrs as the element of the universities' spin-off strategy in Russia. *International Journal of Technology Management & Sustainable Development, 13*(3), 265-281.

Rothaermel, F. T., Agung, S. D., & Jiang, L. (2007). University entrepreneurship: a taxonomy of the literature. *Industrial and Corporate Change, 16*(4), 691-791.

Schumpeter, J. A. (1934). *Theory of Economic Development*. New Bruswick: Transaction Publishers.

Schwartz, M. (2009). Beyond incubation: an analysis of firm survival and exit dynamics in the post-graduation period. *Journal of Technology Transfer, 34*, 403-421.

Stacey and Associates. (2001). *Tupelo/Lee County, Mississippi Small Business Incubator Feasibility Study*. Community Development Foundation.

Stewart, Wright & Associates, LLC. (2007). *Cumberland Business Incubator Feasibility Study*. Roane State Community College Foundation.

The Emerging Technology Consortium and Angle Technology Group. (2009). *Technology Incubator Feasibility Study*. Washington, DC Economic Partnership.

Todorovic, Z., & Suntornpithug, N. (2008). The Multi-Dimensional Nature of University Incubators: Capability/Resource Emphasis Phases. *Journal of Enterpriseing Culture*, 385-410.

Youtie, J., & Shapira, P. (2008). Building an Innovation Hub: A Case Study of the Transformation of University Roles in Regional Technological and Economic Development. *Research Policy, 37*, 118-1204.

Zhe, L. (2013). Comparative Study on Start-up Incubator Construction Case Study on Incubators in Tianjin. *International Conference on Education Technology and Management Science* (pp. 1056-1059). Nanjing: Atlantis Press.