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Use and Access of Emerging Technology Impact: A Study of Startup Women Entrepreneurs in the United States

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USE AND ACCESS OF EMERGING TECHNOLOGY IMPACT: A STUDY OF STARTUP
WOMEN ENTREPRENEURS IN THE UNITED STATES

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
College of Human Science and Education
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The School of Human Resource Education
and Workforce Development

by

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August 2013

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I dedicated this dissertation to my wonderful caring Nephew Duncan Ndinguri Nyambura, who
was taken away too soon. We love you and miss you.

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ABSTRACT

The purpose of this study was to determine the relationship between the extent of use and access of emerging technology in business and different characteristics that motivate entrepreneurial women in the United States to generate business ideas and/or foam businesses. Based on a literature review, Use and Access of emerging technology was conceptualized as repeated or perceived behavior emanating from using emerging technology as well as knowledge of the technology. A new instrument Emerging Technology Entrepreneur Survey was developed and administered online to 283 entrepreneurial women who had provided usable emails in the Women in Business Program seminar event. The final response count was 40 representing a 14.13% response rate.

Based on the studies interpretive scale women entrepreneurs were high users of emerging technologies. There were significant differences in the use of technology mean score based on highest level of education completed and the employment status. No significant differences in use of emerging technology mean score was observed based on gender, ethnicity, and marital status. There was also no significant differences in perceived use of emerging technology mean score based on the given demographic variables. However, differences between demographic variables based on the perceived use of technology and actual use of technology were observed. A binary logistic regression model predicted the absence of business idea generation and or business formation based on the categorical variable use of technology. Nevertheless, the model indicated that increased use of technology leads to increased odds of generating a business idea as well as creating a business when all other factors are controlled. The study concludes that women are using emerging technologies as the to go to sources for information and this in essence may lead to solving problems while at the same time positively affecting business idea generation as well as business formation.

CHAPTER 1: INTRODUCTION

Background of the Study

As the global economy slowly rebounds from the recession, small businesses in the United States and particularly in other states have felt the effects of the financial meltdown. Precipitated by the burst of the housing bubble, the financial crisis deepened as the lending banks faced a reduction in bank capital, leading to a reduction in lending to businesses (Moseley, 2009). In Louisiana, natural disasters such as Hurricane Katrina, Gustav and most recently Isaac have resulted in insured loss payments to individuals and businesses; disaster payments to individuals and businesses; or indirect losses such as lost wages and business downtime (Cutter & Emrich, 2005). A recovering economy creates a challenging environment for entrepreneurs. However, studies have described the job loss conditions during a recession as ripe for entry into entrepreneurship (Farber, 1999). During the past few years, the number of women in the work force has increased (Stride, 2010) and, as a result, any economic downturn affects them considerably. Additionally, poverty levels are higher among women compared to males (Hartmann, 2009). To mitigate their financial situations and the multiple roles they play in society, more women are choosing to become entrepreneurs (Jome, Donahue, & Siegel, 2006).

Entrepreneurship is for many years identified as a significant part of the United States economy (Carland, Boulton, & Carland, 1984). It is estimated that 20 to 40 percent of the overall labor productivity growth in the eight major industrialized countries can be directly attributed to entrepreneurship (Berglann, Moen, Roed, & Skogstrom, 2011). Today, technology, innovation and entrepreneurship are crucial to the nation's economic revival and competitiveness in the global marketplace (Sargeant & Moutray, 2010).

An entrepreneur is a person with the ability to create, innovate, bear risk, manage and achieve targets (Poon & Swatman, 1999). Studies show that more than 70% of the individuals

studied in the United States express a desire to be self-employed or own their own business (Fairlie, 2005). This indicates that both men and women have desire to be entrepreneurs.

Different variables are critical for the success of new entrepreneurial ventures they include: the market and product strategy, the entrepreneur characteristics, the financial aspects, human capital, the origin of the start-up, the technology and production aspects, and the prevailing social and environmental variables (Serarols-Tarrés, Padilla-Meléndez, & Aguila-Obra, 2006).

Louisiana's entrepreneurs are a vital part of the growth of the state. Louisiana has 17.3% of its population living below poverty level and the state ranks as the eighth poorest state in the country (U.S. Census Bureau, 2009). Studies have further confirmed that 49% of children in Louisiana live in low-income families, the majority of them with working parents (Watts & Falgoust, 2006). Therefore, the opportunities provided by entrepreneurship are important to the overall standard of living.

Women and Entrepreneurship

Women entrepreneurial growth is increasingly influencing and supporting the U.S. economy. Studies indicate that since 1990, women-owned businesses have played a key role as employers, customers, suppliers and competitors in the global market (Brush, Carter, Gatewood, Greene, & Hart, 2001). Research indicates that female privately owned firms established between 1997 and 2002 in the United States were growing two times faster than any other group (Center for Women's Business Research, 2009). In addition studies shows that the output, income and employment effect model indicates a growing resource contribution of women-owned businesses. According to the Center for Women's Business Research (2009), "The total labor income for majority-women-owned firms exceeds \$1 trillion a year; the value-added totals \$1.6 trillion giving us a grand total of nearly \$3 trillion in annual economic impact!" (p. 9). Furthermore, a little over 28 % privately held firms are owned by women, and are small scale in

nature, these firms directly and indirectly employ 23.7 million people (Centre for Women's Business Research, 2009).

Previous studies indicate there are numerous variables that may influence women entrepreneurs in a positive or negative way. They are demographic environment, family structure, literacy, education, socio-economic environment, labor force, employment, organizational forms, employment by sectors and economic growth (Minniti & Arenius, 2003). Start-up women entrepreneurs need positive role models, motivation, and opportunities in order to generate ideas and develop successful new ventures. Research highlights the importance of the family context to women entrepreneurs by indicating that most start-up entrepreneurs know someone in their family or close to their family who is self-employed (Mathew & Moser, 1996). The challenges becomes less when entrepreneurs begins their new business if they have a role model that has succeeded. It becomes easy to envision for start-up entrepreneurs to start a business when they can refer to a role model who has tried it before (Shapero, 1975).

With the advancement in technology, the first contact in business ideas and motivation to start one may emanate through technologies such as online social media or smartphone devices. Previous studies indicates that 79% of American adults said they have used the Internet; and (47%) say they use at least one of the social networking sites; 56% of the users of social networking sites are women (Hampton, Goulet, Rainie, & Purcell, 2010). Motivational drivers of starting a business are numerous; research indicates women have made tremendous advances, increasing their proportion as entrepreneurs in the country and therefore taking note of their contribution to the economy should be critical (Sargeant & Moutray, 2010).

Women and Emerging Technology

e- Commerce is defined as digital transactions of commercial business information between traders via communication channels such as the Internet or telecommunications

networks (Magnusson, 2010). These emerging technology transactions also include usage of different types of information systems and emerging technologies (Tuunainen, 1998). The emerging technologies have evoked innovation that has catapulted the rising automated economy. Kowalczyk, Ulieru and Unland (2002) indicated that for an entrepreneur to be competitive in the new age economy, they have to be in a position to exploit emerging technologies that will form the basis of tomorrow's global information networks and ideas built on *e-commerce*. Despite the growth in technology based commerce and its contribution to the economy there has been limited information available on the relationships that may exist between women and emerging technologies (Fountain, 2000).

There are approximately 119 million households in the U.S. that are Internet users; 51% are female and 49% are male (U.S. Census Bureau, 2009). Women play multiple roles in society therefore; technological advancement that enables them to mitigate the challenges of juggling their numerous roles is welcome. As the use of emerging technology grows globally coupled with the important role that women are increasingly playing in business, today (Ndubisi, 2007) research is necessary on how these emerging technologies influence their business ideas. Studies reveal that "Internet businesses have the potential to offer women entrepreneurs more work flexibility than traditional "brick and mortar" business" (Jome, Donahue, & Siegel, 2006, p. 128). Therefore, an increase in the number of women choosing entrepreneurial careers coupled with the explosion of emerging technology business ventures highlights the need to explore the relationship between women and emerging technology.

Startup Decisions and Emerging Technology

Research has begun to explore the influences the external environment has on motivating entrepreneurial startup businesses (Aldrich, 2000). Research has explored why a business fails or succeeds (Sandberg, 1986); however, the occurrences that shape the decisions of

entrepreneurs before the business starts remain unknown. These decisions and intentions to start a business that occur prior to the start of a business influence the goals, strategies and structure of startup businesses (Bird, 1989). These decisions and triggers may not be unique to gender; therefore, understanding the influence that technology has on startup entrepreneur women is critical in targeting potential new ventures.

Studies indicate that slightly above 50% of the population in Louisiana uses the Internet (Day, Janus, & Davis, 2005); moreover, 48% of the Internet users uses social media sites like Facebook. In addition, the Nielsen Company (2011) estimated that by the end of 2011, 50% of cell phone owned a smartphones. Research also shows that 88% of U.S. adults own a cell phone of these, 55% of them use smart phones to access online content and information (Smith, 2012). As more people access the different technologies, technology is no longer viewed as a traditional capital investment, but also as a “general purpose technology” (Bresnahan & Trajtenberg, 1995). The economic contribution accorded by overall general-purpose technology is larger because it gives a multiplier effect (e.g. information on business ideas) by facilitating and complementing innovations of new business ventures in the economy (Brynjolfsson & Hitt, 2000). The contribution of emerging technology to the economy further confirms the need for women research in this area.

Need for the Study

With the vast expansion of technology in Louisiana, studies exploring the relationship of emerging technology on the success of startup entrepreneur women are limited. This study conceptualizes the importance of emerging technologies in generating business ideas start up and nascent women entrepreneur.

Purpose and Objectives

The purpose of this research study is to determine the relationship between the extent of use and access of emerging technology in business and different characteristics that motivate entrepreneurial women in Louisiana to generate business ideas and/or foam businesses. The objectives of this study are:

1. To describe women entrepreneurs on the following demographic and business related variables: Age, Ethnicity, Level of education, type of previous business experience, access to emerging technology (i.e. smart phones, tablet computers, Desktop/Laptop computers, Internet connected game console, Mp3 players, E- book readers and Social networking sites), frequency of using emerging technology (i.e. smart phones, tablet computers, Desktop/Laptop computers, Internet connected game console, Mp3 players, E- book readers and Social networking sites) and type of business started.
2. To determine if differences exist between the extent of use of emerging technologies and the following variables: Ethnicity, highest Level of education completed, marital Status and employment Status.
3. To determine if differences exist between the perceived use of emerging technologies and the following variables: Ethnicity, highest Level of education completed, marital Status, employment Status and Business ownership.
4. To determine if a model exists which would predict idea generation and business formation, as measured by use of technology overall item mean score.

Significance of the Study

There is a scarcity of research investigating the influence that emerging technologies have on business ideas for startup women entrepreneur. The results from this study will contribute to this limited body of knowledge. Prior research on the contribution of emerging

technology to business ideas have largely focused not only on the male entrepreneur but also on adoption and diffusion of the ideas into an established business context (Hung & Chu, 2006).

This study goes beyond that and breaks new ground by considering specific emerging technologies and how they play a part in the overall idea generation for both nascent and startup women entrepreneurs. It does this by incorporating emerging technologies such as social media, the Internet and smart phones.

Emerging technology use has proliferated throughout most sectors of the economies in Louisiana and the United States. Like other general-purpose technologies (Lipsey, Carlaw, & Bekar, 2005), computer-based technologies have become more superfluous as applications and critical masses of users have developed to use the same (Zorn, Flanagan, & Shoham, 2011).

Being able to assess the contribution of emerging technologies on startup women entrepreneurs may give insight into women's career development. This will allow consulting practitioners to have a better understanding of their clients motivating factors that may trigger them to venture into entrepreneurship and hence assist them to make informed decisions. (Buttner & Moore, 1997). In addition there is the possibility that identifying the specific emerging technology triggers that influence women in formulating business ideas may help policy makers as well as entrepreneurship scholars in understanding this area in depth and as a result better informed policy's and additional research may be carried out.

Definitions of Terms

- **Emerging technologies:** This construct is the development of high performance computing and communications gadgets that has resulted in the creation of new media, such as the World Wide Web, virtual reality, social media and smart phone communication (Dede, 1996). In turn, these new media enable new communication methods as well as information dissemination.

- **Emerging technology triggers:** This construct in this study can be described as a platform that serves as a stimulus that initiates business ideas that strive to advance into new business ventures. The idea may or may not result in a fully established firm.
- **Startup entrepreneurial women:** This concept in this study can be described as women who seriously intend to start a business (nascent entrepreneurs) and women who may have started a new business venture within a five-year period. For this study, the concept description is women entrepreneurs.
- **Global entrepreneurship-** The study describes this construct as entrepreneurship that crosses the country borders. These are Entrepreneurs whose intentions is to invest both locally and internationally. For this study, the concept will be described as global women entrepreneurship

CHAPTER 2: REVIEW OF LITERATURE

Global Business

The world today is a global village as areas like communication, trade, learning and travel becomes fast and efficient across continents. This interconnectivity has created new areas in business while at the same time generating competition among businesses across the globe (Khajavi & Nazemi, 2010). These aspects of the global economy have created strategic alliances as well as strategic thinking in organizations as they reorganize to find a business edge (Navickas & Mykolaityte, 2010).

After the Great Depression (1929-1939) the world saw the rise of the United States as an economic power in trade, innovation and industrialization in general (Fraad, 2009). However, during recent times, the rise of other economies (i.e., Brazil, Russia, India and China) has created different conditions that enable trade and competition among different continents (Fraad, 2009). For organizations across the world, their business edge has been through sustained competition from the production of new superior products and services that are unique and different compared to their competitors (Lucia, 2008). Until recently most global organizations have used the growth model to increase revenue; however today's global market dictate that for a firm to have an edge, they have to be more innovative in their operations (Dervitsiotis, 2010).

Successful global business constitutes success in different areas in the organization. Even though global businesses require dynamic and inclusive leadership, there are still more men in higher management positions in global organizations than women (Kooskora & Bekker, 2007). However, as women develop into vital contributors of business in most countries, their increased role as leaders will require increased organizational and personal support which will be vital in their success in the global market (Caligiuri, Joshi, & Lazarova, 1999).

Global Entrepreneurship

The history of entrepreneurship dates as far back as the 18th century and has a relationship with economic and social cultural changes; moreover, its contribution to society is an issue that has been a center for focus (Soltow, 1968). Therefore, the question becomes; why is global entrepreneurship important?

Sternberg and Wennekers (2005) highlighted different functions that global entrepreneurs perform such as bearing the risk of market uncertainty, innovation, competition and restructuring, and generating new knowledge to the economy embedded in new. Because of these contributions to the economy, most governments around the world are creating policies that govern and boost entrepreneurship at all levels (Gilbert, Audretsch, & McDougall, 2004). The Global Entrepreneurship Monitor research indicates that levels of entrepreneurship activities differ by country for example, the study highlights that in Brazil, 1 in every 8 adults is currently starting a business, 1 out of 10 in the United States, 1 out of 12 in Australia, and 1 out of 25 in Germany (Reynolds, Hay, Bygrave, Camp, & Autio, 2000). The differences in activity among countries may be attributed to different institutional policies that are said to be "...critical determinants of economic behavior and economic transactions in general, and they can impose direct and indirect effects on both the supply and demand of entrepreneurs" (Acs & Szerb, 2009, p. 1).

Global entrepreneurship characteristics have been studied based on gender. Through research and in collaboration with major international organizations (i.e., the United Nations Economic and Social Council), gender based main stream programs that guide policy programs were founded that developed gender related policies and programs that allow equality in all sectors (United Nations Economic and Social Council, 2010). Setting up these programs highlights the belief that for progress in the area of entrepreneurship in any country or economy,

investments have to be made in both males and females (Allen, Elam, Langowitz, & Dean, 2007).

Growth of Entrepreneurship in the United States

During the late 19th century, the idea of entrepreneurship in the United States flourished through the rise in class and upward mobility of different individuals who had ventured into new ideas and had created successful businesses (Lamoreaux, 2010). Schumpeter philosophy as an early influencing scholar of American entrepreneurship stemmed from the understanding that entrepreneurship encapsulates an individual with drive, motivation, and creativity; with the ability to overcome obstacles, innovate and readily implement their ideas (Jennings, 1994; Schumpeter, 1947). He advocated for increased research in American entrepreneurship and in a series of conferences that he gave he urged for consented collaborative effort between historians and economic theorists in trying to empirically study how entrepreneurship had shaped the different economic sectors like firms, industries and the notion of modern capitalism (Jones & Wadhwani, 2006; Schumpeter, 1954). The same entrepreneurial spirit has continued to date as more people create new business ideas. According to Kuratko (2003), growth has taken place over time in the United States. He indicates that for the decade before the year 2003, new business incorporations averaged 600,000 per year; 807,000 of this were new small firms established in 1995. He further indicates that even though Fortune 500 companies had lost more than 5 million jobs in the 1980s, by 1996 the economy created more than 34 million new jobs, with a majority of them stemming from small entrepreneurs to a tune of 1.6 million new jobs. However, these gains slowed in recent times as the economic downturn affected the businesses. Sargeant and Moutray (2010) highlight the fact that real gross domestic product fell 2.4 percent for 2009 as a whole and output declined from 6.4 percent to 5.4 percent; however, in mid-2009, economic market conditions stabilized.

To enhance growth again, entrepreneurship has become a key area of enhancement in the American economy since it provides a catalyst for economic activities such as development of new products and services, jobs, technological improvements and new enterprises (Rogoff, 1996). The Entrepreneurship Monitor study highlights the ability of entrepreneurship activity to create jobs. Research indicate that:

More than 70% of those currently involved in a start-up businesses employ at least one person, more than 80% plan to hire at least one person within the first five years of business and more than 20% of individuals involved in entrepreneurial activity plan to hire 19 people within 5 years. (Minniti & Bygrave, 2003, P. 6).

Even though the recession has had nationwide negative effect on entrepreneurship, the United States resilience has always led the world by its innovation (Ali et al., 2009). However, to maintain this competitiveness, the Global Entrepreneurship Monitor (2009) suggests that the policy makers need to tailor their socio-economic programs to the development context of the United States to enhance the entrepreneurial framework conditions (Ali et al., 2009).

Entrepreneurial Contribution to Louisiana's Economy

Entrepreneurship as a source of economic growth and job creation assists in reducing poverty and improves the overall well-being of society. The overall poverty rate in Louisiana in 2009 was 17.6%, while the median household income was \$42,460 (U.S. Census Bureau, 2009); this level of poverty highlights the need for entrepreneurial activity in the state. In addition to a high number of single women headed families, the institute for women policy research indicated that Louisiana is among the states with very high poverty rates (almost 25%) among women compared to the national average (Henrici, Helmuth, & Braun, 2010). However, women have continued to flourish as entrepreneurs as indicated by studies conducted by organizations such as Womenable (2011); "revenues of women owned businesses in Louisiana have increased by

110.3% from 1997 to 2011 which is substantially above the national average” (Alfonso, 2011, p. 3).

According to the Kauffman Index of Entrepreneurial Activity (2011), Louisiana is among the states with the highest entrepreneurial activity rates, 460 adults per every 100,000 are entrepreneurs (Fairlie, 2011). This increasing trend in entrepreneurship results from the recession, which has caused high levels of unemployment, and this, pushes people to start income generating ventures that results in creating new entrepreneurs (Fairlie, 2011). With a recorded high unemployment rate of 8.2% (Bureau of Labor Statistics, 2011), Louisiana’s need for entrepreneurial activity to mitigate the unemployment gap is needed. However, even with high unemployment, Louisiana outperforms the national average in growth. In addition, the state government supports entrepreneurial activities through the elimination of unconventional business taxes and strengthening of governmental ethics laws (Moret, 2011). According to the Louisiana Department of Economic Development (2011), these business friendly state activities have boosted entrepreneurial activities by increasing investment from not only the local population but also from leading companies (Moret, 2011)

Women and Entrepreneurship

For the past decade, there has been a considerable growth in women entrepreneurship. According to the American Express OPEN report, the number of women entrepreneurs in the United States between 1997-2011 increased by 50%; this resulted in an estimated 8.1 million women-owned businesses, generating nearly \$1.3 trillion in revenues and creating employment for nearly 7.7 million people (Alfonso, 2011). However, in spite of this increase, male-owned businesses have the majority share of the market. While studies indicate there are similarities between entrepreneurs in personal demographics such as gender, differences exist between female and male businesses choices in terms of the business ventures they choose, funding

strategies they seek, development patterns and authority structures they develop (Greene, Hart, Gatewood, Brush, & Carter, 2003). For many years, men have had a higher income, occupational status, and self-employment than women; however in recent times the income gap has narrowed and an increased number of women are becoming entrepreneurs (Renzulli, Aldrich, & Moody, 2000).

Even though there is visible progress to promote and accept women entrepreneurs, more is required for sustainable progress. A study conducted through the Organization for Economic and Co-operation and Development, Delmar and Holmquist (2004) reaffirm the need for continuous studies on women entrepreneurs for two reasons:

- There has been limited recognition of women entrepreneurs as major contributors of economic growth in many economies (Delmar & Holmquist, 2004).
- The study of women in entrepreneurship is incomprehensive and more research to understand this field is necessary (Delmar & Holmquist, 2004).

Triggers for Women to Start a Business

Entrepreneurship is a personal decision that may not be separated based on gender. However, when considering entrepreneurial motivation, there may be a few social differences between men and women (Orhan & Scott, 2001). According to Greene et al. (2003), Eleanor Schwartz was among the few pioneers in the seventies that first published an article discussing some of the characteristics and would be motivations of women entrepreneurs. In her study, Schwartz concluded that the key motivators for women entrepreneurs were not different from men; they included job satisfaction, economic payoffs, and independence (Schwartz, 1976). However, subsequent researchers gave more insight into the aspect of what motivates women to become entrepreneurs.

Buttner and Moore (1997) highlighted the aspect of pull and push factors and how it contributes to motivation of women entrepreneurs. The push factors are elements of necessity such as insufficient family income, dissatisfaction with a salaried profession, difficulty in finding employment, and the need for flexibility due to family responsibility. The pull factors include the entrepreneurial desire, society status, personal independence, self-fulfillment and power (Buttner & Moore, 1997). Exemplifying the pull and push factors, Orhan & Scott (2001) also conducted a study of women from eight English speaking countries utilizing qualitative interviews in which they identified the following motivating factors for women entrepreneurs:

- Dynastic compliance- The study found women who were motivated to be entrepreneurs due to inheritance of ideas or business from family members or close relations (Orhan & Scott, 2001).
- No other choice- the study found that some women are motivated to be entrepreneurs due to the surrounding financial conditions; for example, they may have lost a job or relocated to new areas with family (Orhan & Scott, 2001).
- Entrepreneur by chance- Stemming from the push factors by Buttner and Moore (1997), Orhan and Scott (2001) study identified the motivational aspect obtained from external circumstances; for example, bankruptcy of a family business may make women venture into entrepreneurship to keep the business running.
- Natural succession- Through inheritance or spousal support, women are motivated to be entrepreneurs if they passed down the mantle (Orhan & Scott, 2001).
- Informed entrepreneurs- These are entrepreneurs motivated by their close working environment (i.e., having the knowledge to start a venture or having a role model to guide

them) to start a business either similar to what the role models have or better (Orhan & Scott, 2001).

- Forced entrepreneur- These are women who are motivated to be entrepreneurs due to necessity, i.e., they feel they need to change careers (Orhan & Scott, 2001).
- Pure entrepreneurs- These are self-motivated women who choose to be entrepreneurs and develop their own businesses (Orhan & Scott, 2001).

Other studies have mentioned independence as well as the capacity to follow career goals together with family responsibilities as key motivators (Morris, Miyasaki, Watters, & Coombes, 2006). Even with the multiple motivating factors indicated, no research has looked at emerging technologies as motivating factors among women in starting a business.

Additionally despite the different documented motivating factors for women entrepreneurs, there are still obstacles facing women entrepreneurs. A number of challenges that face women highlighted by Delmar and Holmquist (2004) in their report developed for the Organization for Economic Cooperation and Development include:

- Women are minorities in many countries when referring to startup entrepreneurs (Delmar & Holmquist, 2004).
- Social factors such as lack of enough role models and competing demand for time is a challenge for women (Delmar & Holmquist, 2004).
- Women face unfriendly institutional and political frameworks and biases on research instruments that measure women in the entrepreneurial field (Delmar & Holmquist, 2004).

Emerging Technology Contribution to Entrepreneurship

Information and communication technologies will be one of the most dynamic sectors in the recession as a result the recovery strength depends on how innovative this sector is (Pascall, 2010). Studies of entrepreneurship have heavily focused on the success of individuals while they are setting up a new business (Mezias & Kuperman, 2000). Some research has theorized specific individual personal traits that entrepreneurs may possess, while others have conceptualized the idea that entrepreneur's success results from traits that few possess (Garud & Karnoe, 2003). However, despite this theorized individual entrepreneurial traits recent research highlights the effects of other additional traits such as technological innovation and organizational structure that are necessary to achieve success (Mezias & Kuperman, 2000).

Studies have further highlighted the idea that as technology continues to evolve and dynamically progress, this influences the rate of entrepreneurship (Shane, 1996). In addition, further research indicates that characteristics of entrepreneurs such as risk taking and being proactive strongly relate to knowledge acquisition and technological innovation (Nasution, Mavondo, Matanda, & Ndubisi, 2011). Entrepreneurial innovation today epitomizes by development and adoption of technology (Doganova & Eyquem-Renault, 2009). Entrepreneurs are role players in introducing new ventures that are technologically innovative into the market and hence stimulating the growth of new entrepreneurs and businesses ideas (Miller & Garnsey, 2000). Examples are evident by the development of small startup businesses that are developing inventions and technology with significant potential commercial applications (Gans & Stern, 2003).

Technology innovations such as online websites, phones and social networking websites are means in which communication diffuses in organizations (Fulk, 1993). Through such information technologies, entrepreneurs have the ability to recognize opportunities that translate

into business ideas and innovation and this can eventually contribute to economic and social development (Ucbasaran, Westhead, & Wright, 2009). Given the increased women involvement in entrepreneurship activities, technology becomes a potential gateway to cultivate ideas that may translate into business ventures and thus help the economy as a whole (Kalesanwo & Awoderu, 2009). Therefore, to optimize the relationship between technology and entrepreneurship, technology as a tool for entrepreneurial ideas is important to sustain invention that in turn increases the likelihood that new firms will be founded (Harhoff, Narin, Scherer, & Vopel, 1999; Shane, 2001).

Women Entrepreneurs and Emerging Technology

For a long time the emerging technology sector has been male dominated with women slowly entering this field (Pascall, 2010). However, with increasing numbers of women entrepreneurs and technology increasingly taking a predominant role in fostering innovation, involvement in this sector by women will have to be encouraged to increase investment (Pascall, 2010). Women undertake multiple life roles; therefore, emerging technology may be useful as they try to juggle between their multiple roles and their entrepreneurial responsibilities (Jome et al., 2006). One example of emerging technology utilization where women have grown is in areas such as the Internet utilization. Through the Internet, women are able to venture into new entrepreneurial roles with ease and flexibility; it is also an easier way to operate a business since it requires less capital and requires limited face to face human interaction. Additionally, emerging technologies such as social networks, where women tend to be more socially active than men (Lewis et al, 2008), creates personal and business networks that provides opportunity for women to counterbalance and overcome the difficulties and barriers that they may face in real-life interactions (Herring, 2001) and this in turn creates new network based opportunities.

Technology use is increasing among women. This upward trend is affecting how business operates and how women are making their entrepreneurial decisions to start new business ventures (Smith, 2010). Research conducted by the Pew Research Centre (2010) highlights the use of selected emerging technologies by gender today in the United States. The data highlights the increased use of emerging technology among women. The diagrammatic representation below (Table 1) highlights the use of this selected emerging technology based on gender (Smith, 2010, pp. 5-9).

Table 1. Use of Selected Emerging Technologies as Reported by Smith (2010)

| Technology | Percentage of usage (%) | |
|---------------------------|-------------------------|--------|
| | Male | Female |
| Computer ownership | 78 | 75 |
| Cell phone ownership | 88 | 82 |
| Mp3 player ownership | 47 | 46 |
| Game console ownership | 45 | 40 |
| e-Book reader ownership | 4 | 5 |
| Tablet computer ownership | 5 | 3 |

The high usage rate of emerging technologies and the minimal differences between the emerging use by men and women may be evidence that there is a high user technology acceptance, which is propelling women innovation, globalization of women ideas and businesses as well as attracting research from practitioners on women issues and technology (Spanos, Prastacos, & Poulymenakou, 2002).

Women and Emerging Technology Mentorship

One of the motivating factors of women to be entrepreneurs is having a role model to guide them through the whole process (Orhan & Scott, 2001). Using emerging technologies that are interconnected, different websites have been developed by various organizations (i.e., Women Business Enterprise National Council, National Association of Women Business Owners, Women Business Owners South) to help support and act as virtual mentors for women

entrepreneurs. Mattis (2004) conducted a study of a national sample of 800 U.S. business owners – 650 women and 150 men employing a survey design method. The research noted that 46% of the women surveyed reported that they had a mentor or role model when starting up their business. In today's global economy women entrepreneurs continue to look for ways to exchange and transfer knowledge as well as innovate and improve. Where's face to face mentoring requires physical presence of a mentor and mentee, emerging technologies provide platforms that support virtual communities where people work together through face-to-face and virtual situations using advanced IT systems to fulfill business objectives (Creed & Zutshi, 2008). This type of virtual mentoring creates a diverse pool provided by virtual community mentors ensure that the mentee feels confident with the learning. Virtual mentoring is also useful in allowing women entrepreneurs to understand and communicate with the latest technology skills, which creates new possibilities for the accessibility of top mentors within across the world and local leaders who are external to them (Colky, Colky, & Young, 2006). This learning process through these virtual communities allows women entrepreneur mentee to increase their knowledge which in turn positively affect their entrepreneurial idea pool.

Women, Age and Emerging Technologies

For many years, researchers had the notion that intellectual ability of both genders declined with age (Wechsler, 1958). However, today's dispelled views on intelligence declining with age leads to focus on certain abilities having dissimilar gender and age functions (Botwinick, 1967; Morris & Venkatesh, 2000). Morris and Venkatesh (2000) conducted a study of a population of 130 people in a mid-sized financial accounting firm employing an experimental design. The researchers noted that, for young people in the short term, their underlying drivers towards use and adoption of technology stem from underlying attitudes. On the other hand, for older persons, social and process factors affect them initially. In the long

term however, no differences existed between perceptions to emerging technology in the two age groups. This led to the study conclusion that age does not have an important influence on technology adoption and sustained usage decisions (Morris & Venkatesh, 2000). These results highlights the need for further research to discern whether a relationship exists between the variable age and the ability of women entrepreneurs to use emerging technology in generating entrepreneurial ideas and decisions.

Gaps in the Literature

Reviewing available literature gives a wide range of studies that are not gender focused and that mainly focus on technology diffusion of emerging technologies (Eastin, 2002). However, a significant gap seems to be present in both the research conducted and the scholarly articles published in the area of entrepreneurship technology that specifically indicates if relationships exist between women entrepreneurs and emerging technologies in their ability to formulate business ideas and or create businesses in the southern region of the united states.

Theoretical Framework

Two models: Technology Acceptance Model (TAM) (Davis, 1985) and Dynamic Capabilities Theory (Teece, Pisano & Shuen, 1997) have guided this study. TAM emanates from the Theory of Reasoned Action (TRA) by Fishbein and Ajzen (1975) while parts of Dynamic Capabilities theory in the literature stem from the evolutionary theory of the firm (Nelson & Winter, 1982).

Technology Acceptance Model

Fishbein and Ajzen (1975) Theory of Reasoned Action presented the argument that behavior of individuals emanates from behavior intentions, which in turn stems from their attitude towards the behavior and other norms that the individual may think are important to behaving in a certain way. On the other hand Davis (1985) refined this representation and

presented the Technology Acceptance Model (TAM) that has become one of the most widely reference model that explores technology acceptance and usage. TAM was adapted from the theory of reasoned action. It highlights the fact that if individuals perceive a technology as easy to use they are more likely to use the system. TAM further creates a connection between the perceived use and perceived usefulness. It highlights the notion that the initial interface that people use in a technology is an important determinant in communicating ease of use (Davis 1985). TAM further suggests that two specific philosophies perceived ease of use and perceived usefulness—determine one’s behavioral intention to use a technology, which links it to subsequent behavior (Sheppard et al., 1988; Taylor & Todd, 1995). TAM advances that perceived usefulness of technology influenced by perceived ease of use because, other things being equal, the easier a technology is to use, the more useful it can be (Venkatesh, 2000). In line with TRA, TAM suggests that the effect of external variables (e.g. the design characteristic of emerging technology) on intention mediates through key beliefs (i.e., perceived ease of use and perceived usefulness) (Davis, 1989). External variables such as emerging technology design characteristics (for example how an i-phone or an i-pad looks) and user computer self- efficacy theorized to influence behavioral intention to use, and ultimately usage, indirectly via their influence on perceived usefulness and perceived ease of use (Davis & Venkatesh, 1996). Further using Davis (1989) analogy perceived usefulness is the degree in to which a person believes that using emerging technology would enhance his or her productivity. On the other hand, perceived ease of use is the degree to which a person believes that using emerging technology would be free of effort. The diagrammatic representation below (figure 1) represents the TAM model.

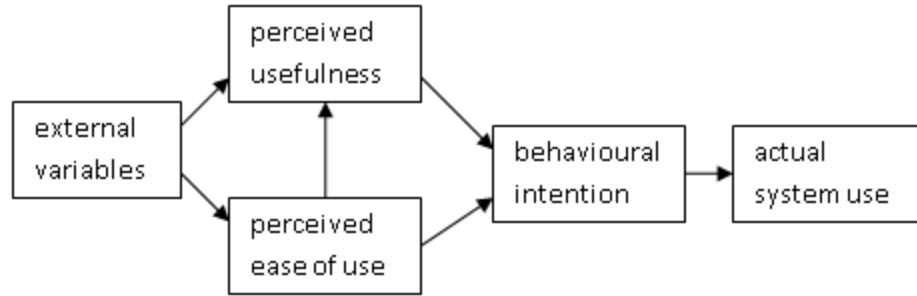


Figure 1: The Technology Acceptance Model (Davis, 1989)

Acclaimed for its predictive power TAM has gone through some enhancement over the years. Venkatesh and Davis (2000) enriched the theoretical constructs of TAM by extending the model to include additional key determinants of TAM's perceived usefulness and usage intention constructs, and to understand how the effects of these determinants change with increasing user experience over time with the target system. Using additional theoretical construct such as subjective norm, voluntariness, cognitive instrumental processes, job relevance, output quality, result demonstrability and perceived ease, Venkatesh and Davis (2000) developed TAM2. The diagrammatic representation below (figure 2) represents the TAM2 model.

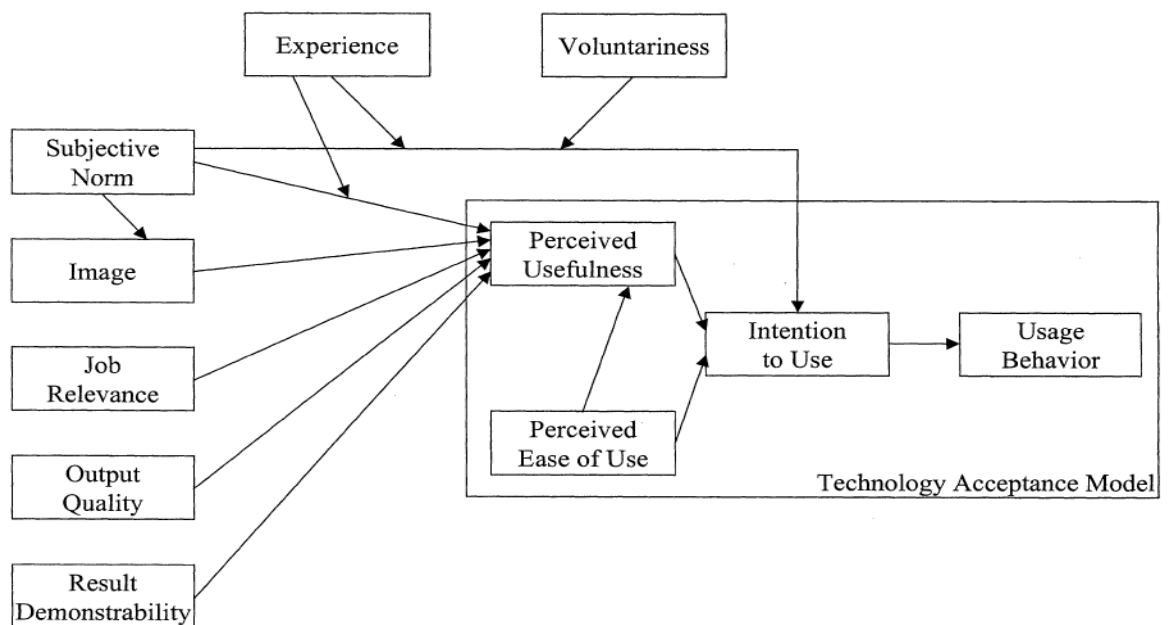


Figure 2: The Technology Acceptance Model 2 (Venkatesh & Davis, 2000)

TAM2 main objective was to create a better understanding of the determinants of perceived usefulness, which would in turn spur user acceptance, and usage of new system. The tested model revealed that the theoretical constructs explained up to 60% of the variance in the TAM2 model driver of usage intentions. Additionally, TAM2 extended the theoretical construct of TAM by showing that subjective norm exerts a significant direct effect on usage intentions over and above perceived usefulness and perceived ease of use for mandatory systems (Venkatesh & Davis, 2000) .

TAM has received extensive empirical support through validations, applications, and replications. Davis (1989) validated TAM measurement scales for perceived usefulness and perceived ease of use, the two distinct variables hypothesized to be determinants of technology usage. The scales had strong psychometric properties with perceived usefulness scale attaining Cronbach alpha reliability of 0.97 while perceived ease of use achieved a reliability of 0.86. In addition, validity was tested using multitrait-multimethod (MTMM) analysis (Campbell and Fiske, 1959) where both perceived usefulness and perceived ease of use items highly correlated together as evidence that they measured the same traits. Moreover, Davis and Venkatesh, (1996) study went further and looked at the TAM scale results that showed that high reliability, validity depicted large proportion of variance in intention explained by perceived usefulness, and ease of use could simply be an artifact of the measurement approach, which groups together multiple items measuring a single construct. After conducting three experiments the study suggest that TAM is a robust model both from a theoretical framework and from measurement standpoint relied upon to study acceptance and use of information technologies. TAM has further been validated using entrepreneurs. Ndubisi, Jantan and Richardson (2001) study looked at the relationship between perceived usefulness, perceived ease of use and usage behavior of

information technology among Malaysian entrepreneurs. The study focused on whether any significant relationship existed between given entrepreneurial variables (prior computer use, data intensity use, staff support, computer training, and technical support) and the entrepreneurs information technology perceived usefulness and ease of use. The study results revealed that perceived usefulness had a direct positive relationship with information technology use while perceived ease of use had an indirect positive relationship with usage. The results therefore furthers our studies proposed argument that women entrepreneurs perceived usefulness of emerging technology is directly related to useful generation of entrepreneurial ideas. Therefore using the principle of TAM research, the study conceptualizes a relationship between entrepreneur women perceived continuous use of emerging technology and perceived usefulness, which in turn affects entrepreneurial behavior intentions.

Emerging technology use and TAM: Emerging technology use is measured in terms of the usage behavior of startup women entrepreneurs. In line with TAM logic of system use the study looks at; 1) behavioral usage of emerging technologies such as i-pads, social networks, computers, Mp 3 players and E-readers, 2) The frequency of use of emerging technology 3) Usefulness of the emerging technology (How often do you use emerging technology to perform certain tasks?)

Perception and TAM: Perceived usefulness in the study uses Davis (1989) TAM analogy as the degree into which a person believes that using emerging technology would enhance his or her productivity. While, perceived ease of use is the degree to which a person believes that using emerging technology would be free of effort. Research further shows that perceived usefulness and perceived ease of use are determinants of usage (Davis, 1989; Ndubisi et al., 2001). Measures of perceived usefulness in this study are perceptions that using emerging technology

provides start up business ideas and are useful in business. On the other hand perceived ease of use are measured in terms of frequency of interaction with the emerging technology.

Dynamic Capabilities Theory

Some scholars view dynamic capabilities as the key to competitive advantage (Teece, Pisano, & Shuen, 1997). The theory is explained in terms of how combinations of competences and resources can be developed, deployed, and protected (Teece et al., 1997). Competences according to Teece et al. (1997) span individuals and groups such that they enable distinctive activities performance; these activities constitute organizational routines and processes such as quality and knowledge acquisition. Dynamic Capability Theory emphasizes the development of difficult-to-imitate combinations of organizational, functional and technological skills, which are nitrated into research and development, technology use and transfer, human resource and organizational learning (Teece et al., 1997). It is the capacity to renew competences to achieve congruence with the changing business environment (Teece, 1993). While this may take place within the firm, applicability among start up women entrepreneurs is evident. With increased change in emerging technology, dynamic capability is necessary to allow entrepreneurs adapt, integrate, and reconfigure their skills, resources, and functional competences to match the requirements of a changing environment (Teece et al., 1997). From early definitions of entrepreneurship innovation and ability to adapt to changing circumstances takes an individual with unique character and traits to overcome given challenges and implore there ingenuity to solve the problem and emerge as an entrepreneur (Jennings, 1994). Just as firms must follow a path of competence development so does an individual starting a business. Therefore for a woman entrepreneur to achieve competitive advantage they must exploit existing and new emerging technology capabilities (Penrose, 1959; Wernerfelt , 1984). Research shows that

diverse experience by an entrepreneur can be an integral part of business success (Bruno & Tyebjee, 1985; Hisrich & Peters, 2002; Roberts, 1991). When starting a business numerous resources such as human and financial capital, networks and strategic alliances assist in acquiring requisite complementary resources and capabilities (Deeds & Hill, 1996; Johnson & Sohi, 2003). Dynamic Capabilities indicate the ability of entrepreneurs to combine and coordinate these accessible internal and external resources, to gain and internalize new knowledge from other organizations, and to transform and reconfigure the resource base of their start-up ventures into new processes or routines (Wu, 2007). The absorptive capacity indicates how prior knowledge influences the capacity of firms to obtain new knowledge (Cohen & Levinthal, 1990). A firm obtains knowledge in two ways: external knowledge acquisition and intrafirm knowledge dissemination (Heeley, 1997). On the other hand dynamic capabilities of startup entrepreneur women consist of complementary resources from external sources (e.g. emerging technology) and internal resources from the entrepreneur themselves (Wu, 2007). Therefore Human capital (i.e. entrepreneurial women) delivers both functional capabilities (such as acquisition of knowledge through emerging technology), as well as the capability to innovate and solve business problems (Penrose, 1959). Utilizing the dynamic capability principle, the study conceptualizes that women entrepreneurs acquire knowledge through the emerging technology, which is potent in responding to the challenge of innovation that helps them emerge as entrepreneurs.

Business venture triggers and dynamic capabilities: Dynamic capabilities theory encapsulate development of difficult-to-imitate combinations of organizational, functional and technological skills, which are nitrated into research and development, technology use and transfer, human resource and organizational learning (Teece et al., 1997). Dynamic is the

adaptive or renewing nature of a firm with changing external environments (Sher & Lee, 2004). On the other hand, capabilities utilized in a volatile world include adoption, integration, and reconfiguration of endogenous and exogenous organizational skills, resources, and functions to succeed (Sher & Lee, 2004). To succeeded women entrepreneurs need the flexibility and innovative when entering a changing business world and hence the study looks at the role of emerging technology in enhancing this innovation.

Knowledge management seeks ways of building competitive advantage (Grant, 1996) therefore effective and efficient knowledge acquisition and utilization by women entrepreneurs is critical in maintaining dynamic capabilities. In line with dynamic capability analogy the study conceptualizes that the knowledge acquired by women entrepreneurs using emerging technology is adopted and utilized to formulate business ideas.

Study Model

Entrepreneurship is a combination of individual will and some environmental factors that create a need or problem that may need to be solved (Schumpeter, 1954). Such environmental factors include emerging technology (Davis, 1985), motivational pull and push factors (Buttner and Moore, 1997), training through incubators and institutions (Chen, Watson & Azevedo, 2011) among many others. There is lack of significant research that highlights the role that emerging technology plays in triggering startup women entrepreneurial ideas. TAM models (Davis, 1985; Fishbein & Ajzen, 1975) and Dynamic Capability Theory apply in this case because they highlight the perceived behavior intentions of individuals coupled with their strategic use of technology, which ultimately influences their attitude and their ability to make decisions. Therefore, the study analogizes women entrepreneurs' behavior to use emerging technology stems from their innovative attitude that results into perceived ease of use of emerging

technology (Davis, 1989) which may trigger ideas on new business ventures. The user acceptance behavior and dynamic capabilities may determine ones intention to use a technology, which in turn leads to subsequent behavior and usefulness (Sheppard, Hartwick, & Warshaw, 1988). TAM and Dynamic Capability theory discussions on technology use and acceptance, individual behavioral capabilities and idea generation support the studies emerging technologies decision trigger model. Figure 3 below depicts the conceptualized model.

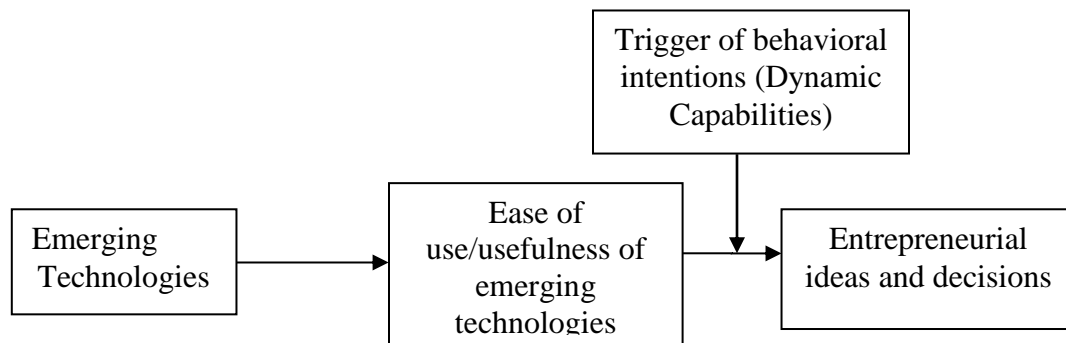


Figure 3. Emerging Technologies Decision Trigger Conceptual Model

The emerging technologies decision trigger model above is an intermediated model built for this study to represent not only the triggers emanating from women entrepreneurs capabilities but also the relationship between the perceived usefulness of emerging technology and the motivation for startup entrepreneurial women in the southern region of United States. Studies indicate that perceived ease of use and usefulness is an imperative factor influencing user acceptance and usage behavior of emerging technologies (Venkatesh, 2000). Therefore, since women's access and use of emerging technology is high (Smith, 2010), inferences on perceived ease of use that otherwise may be related to behavioral capabilities may be concluded. This study will conceptualize the perceived use of emerging technologies and its subsequent triggered behavioral capability intentions that may result to formulating entrepreneurial ideas. This study creates a platform for looking at startup entrepreneurial women and emerging technology triggers that will provide additional needed knowledge to the literature.

CHAPTER 3: METHODODOLOGY

Population and Sample

The target population of this study was women who were aiming to start their own businesses and/or women who had already started a business within the past 5 years. The accessible population is women who participated in Women in Business (WIB) seminar event during the years 2006 – 2010 in Louisiana sponsored by a large research university in the southeastern portion of the United States. The researcher obtained a database of 385 email addresses. A total of 102 email addresses were erroneous or undeliverable. A final accessible population of 283 women, whose emails were usable, was targeted for this study. This represents the total number of women who registered and attended the daylong WIB seminar events and all women who registered and attended the one hour and thirty minute WIB “brown bag lunch” speaker and networking events. These women were either interested in starting their own business or already owned their own business (for a period of 5 years) from the year 2006-2010. This study was considered a census (100% sample) of all women who participated and provided useable email address in Women in Business (WIB) seminar.

Ethical Considerations and Study Approval

Prior to collecting data, an application for exemption from institutional oversight was submitted to the LSU Institutional Review Board. The study was granted approval # E8029 (Appendix A).

Instrumentation

A broad review of literature determined that no existing instrument satisfactory demonstrated the impact of emerging technology on idea generation and business formation among women entrepreneurs. Emerging technology triggers of business ventures have been conceptualized in this study as incorporating women entrepreneur s’ knowledge of emerging

technologies, use of emerging technologies, importance of emerging technology in starting a business/generating a business idea and perceived behavioral attributes of use of emerging technology. Therefore, an instrument incorporating three sections, user knowledge and use of emerging technologies, importance of emerging technology in starting or generating a business idea and behavioral perceptions on use of emerging technologies was developed (Appendix B). Two sections of the questionnaire were created based on an extensive literature review and one section consisted of items drawn from an existing instrument. The instrument also included a section designed to implore the demographic information of the respondents.

The first section contains items, which assess user knowledge and extent of use of emerging technologies. Studies show that perceived ease of use directly influences perceived knowledge; however, constraints such as time, limited abilities and other external factors may limit extent of use (Davis, 1985). A total of five items that represent the knowledge and use of emerging technologies were developed for this section. Respondents identified the technologies they know and the amount of time they use certain emerging technologies in a day. In addition, respondents are required to indicate how often they use emerging technology to complete different tasks stated in the study and describe how they use social media sites. They were also required to rate their frequency of use in a five point Likert-type scale: 1= very frequently 2= frequently, 3= occasionally, 4= rarely and 5= very rarely.

The second section contains items that capture the importance of emerging technology in starting a business/generating a business idea. The section contained six questions that captured whether respondents had started a business; if so they described the type of business, years they had been in operation and the importance of emerging technology in starting their businesses. If they had been in business respondents indicated if they had any business idea, the business area

they hope to venture into and the importance of emerging technology in developing their business ideas.

The third section contains items, which assess perceptions towards emerging technology. The items for this section were adapted from attitude towards online banking scale developed by Kuek and Lai (2006) which reflect the behavioral perceptions and attitudes on online banking. The perceptions towards online banking have seven items and a reported Cronbach alpha .897. However, the online banking scale aimed to assess attitudes of online bankers in Klang Valley, Malaysia. Changes made to the adapted items ensured that the scale was in line with the broader conceptualization of emerging technologies decision trigger model that considered women entrepreneur perceptions towards emerging technology role in shaping their entrepreneurial decisions. Items, which had online banking emphasis, were either rephrased or deleted and additional items related to this study added. Eight items were retained for this section. Respondents rated the degree to which they agree or disagree with the given statements. Each item measures a characteristic of respondents on a four-point anchored-type scale: 1= strongly disagree, 2= disagree, 4= agree, and 5= strongly agree.

The instrument also collected demographic information. According to Porter & Donthu (2006) age, educational attainment (highest educational level completed) and ethnicity affect individual perceptions on use of emerging technology. Other demographic information collected include: current marital status, current employment status and if employed their current position.

Questionnaire Pretesting

To establish content reliability and validity four subject-matter experts (SME's) reviewed the instrument. The SME's have expertise in the following areas: distance learning and evaluation, social science research, women entrepreneurship and management. Appropriate revisions were made to the instrument based on the input of the experts with regard to the

presentation, content and overall structure of the questions. In addition, five women with diverse educational and business background responded to the questionnaire and offered feedback as to the necessity, relevance, structure, and clarity of each of the questions and instructions. They also offered feedback on the length and overall ease in completing the questionnaire. Most of the women were in higher education administration. The feedback of these women was useful since they were involved in small startup businesses, and their background areas exposed them to understanding entrepreneurial principles.

As a pretest of the survey, 10 female respondents complete the questionnaire. Feedback on issues such as readability, clarity, amount of time taken to complete the survey, and overall ease in completing the survey were solicited. The respondents' views were meant to approximate the women who participated in the business program that were the target of this survey.

Based on the feedback received, appropriate revisions were made to the questionnaire. Of the many revisions made to the questionnaire, the biggest change that was made was on the scale for the “user knowledge and extent of use of emerging technologies” section of the questionnaire. Initially, to capture the use of technology respondents were directed to approximate how often they use certain emerging technologies in their daily activities on a six point scale Likert-type scale: 1= never, 2= very rarely, 3= rarely, 4= occasionally, 5=very frequently and 6=always. Many respondents in the pre-testing stage identified that the responses did not capture the exact frequency of their use. Hence, the researcher changed the scale to capture the number of hours they use emerging technology per day. Therefore, the scale for the “user knowledge and extent of use of emerging technologies” section was a choice matrix from 1-24 hours.

The Emerging Technology Entrepreneur questionnaire consists of three sections: user knowledge and use of emerging technologies; importance of emerging technology in starting or generating a business idea; and behavioral perceptions on use of emerging technologies was developed. The researcher developed the first two sections, while the last section was adapted and modified from an existing questionnaire.

Data Collection

The survey was administered via an online survey system (SurveyMonkey©). The online survey system was considered convenient given the accessible e-mail address database of startup women who participated in Women in Business (WIB) seminar event during the years 2006 – 2010 in Louisiana. All participants who have provided usable email address in Women in Business (WIB) seminar were surveyed in this study.

Dillman (2007) highlights the need for multiple contacts for an online study to have maximum response. In this study, six contacts with the respondents were undertaken. The following data collection process was used in the study:

1. Initial notice: Two days prior to sending out the survey, a brief e-letter (Appendix C) from the head coordinator of women in business seminar was sent notifying respondents of the upcoming study, the expected benefits and requesting their participation.
2. First e-Mailing: The web-based survey was emailed to the respondents two days after the pre-survey notification. The survey contained an electronic cover letter (Appendix D) requesting the respondents' participation and providing guiding instructions for completing the survey and the URL (Uniform Resource Locator) link to the web survey. Respondents who preferred to respond to a hard-copy survey had to provide their physical address via a provided email address, where one would be mailed to them. A

statement indicating a \$50 Amazon.com gift card incentive awarding two respondents that were among those who responded in the first two weeks was included.

3. First Friendly Reminder: One week after sending the email with the URL link, all non-respondents were sent a friendly reminder soliciting participation in the survey (Appendix E). The URL link was provided in this message. A statement indicating a \$50 Amazon.com gift card incentive awarding two respondents that were among those who responded in the first two weeks was included.
4. Second e-Mailing: Two weeks after the initial reminder, all non-respondents were sent another email (Appendix F) stressing the importance of the study and requesting their response, the URL link to the survey was included.
5. Second Friendly Reminder: A second friendly reminder message with the URL link to the survey was sent one week after the second e-mailing.
6. Third Friendly Reminder: In order to increase the response rate an additional reminder was sent one week later. The URL link to the survey was included.

To increase the response rate a forth reminder was sent a week after the third one. A total of 40 respondents completed the web-based survey. No useable telephone numbers were available to contact our responders to increase our response rate. All responses were carefully examined and three responses were found to be partially complete. In cases where respondents partially completed, a careful examination of the responses revealed that the missing responses occurred in the demographics section. In the partially completed surveys, the three survey sections (user knowledge and use of emerging technologies; importance of emerging technology in starting or generating a business idea; and behavioral perceptions on use of emerging technologies was developed) were fully completed, therefore the responses were counted as part of the final data.

The final response count was 40 responses out of a possible 283 respondent (14.13% response rate).

To determine if there were any statistically significant differences between respondents and non-respondents, a comparison was made between the overall mean score of early respondents and that of late respondents. Statistically significant differences were not found between early and late respondents, and it was thus concluded that no statistically significant differences existed between the respondent and non-respondents in this study.

Data Analysis

Below is a description of how data collected was analyzed for each of the given objectives

Objective 1: Demographic characteristics and knowledge of Emerging Technology

Objective one seeks to describe startup entrepreneur women on the following demographic and business related variables:

1. Age
2. Ethnicity
3. Level of education
4. Type of previous business experience
5. Access to emerging technology (i.e. smart phones, tablet computers, Desktop/Laptop computers, Internet connected game console, Mp3 players, E- book readers and Social networking sites)
6. Frequency of using emerging technology (i.e. smart phones, tablet computers, Desktop/Laptop computers, Internet connected game console, Mp3 players, E- book readers and Social networking sites)
7. Type of business started

The categorical variables - ethnicity, level of education, type of previous business experience (if any), and access to technology were summarized using frequencies and percentages. Additionally, means and standard deviations of the interval variables were calculated.

Objective 2: Differences between the extent of use of Emerging Technologies and different entrepreneur women characteristics

Objective 2 seeks to determine if differences exists between the extent of use of emerging technologies and the following variables:

1. Ethnicity,
2. Highest Level of education completed,
3. Marital Status and
4. Employment Status.

The level of extent of use of emerging technology was determined by a summation of the sub-scale scores of the section of the extent of use of emerging technologies. The objective was assessed through One-way Analysis of Variance. Levene's Test was used to examine the homogeneity of variance. The interval variable 'use of technology' was determined by aggregating the sub score from the section that comprises how women entrepreneurs used the emerging technology. The overall use of technology item mean score was compared among the groups or levels within the above demographic variables.

Objective 3: Differences between perceived use of Emerging Technologies and different entrepreneur women characteristics

Objective 3 seeks to if differences exist between perceived use of emerging technologies and the following variables:

1. Ethnicity

2. Highest Level of education completed
3. Marital Status
4. Employment Status
5. Business ownership status

The level of perceived use of emerging technology was determined by a summation of the mean sub-scale scores of the section of perceptions towards emerging technologies. The objective was assessed through One-way Analysis of Variance. Levene's Test was used to examine the homogeneity of variance. The interval variable 'perception of use' was determined by aggregating the mean sub score from the section that comprises perceptions on emerging technology. The overall use of technology item mean score was compared among the groups or levels within the above demographic variables.

Objective 4: Predictive model of idea generation and business formation, as measured by use of technology overall item mean score

Objective 4 seeks to determine a model exists that explains a significant portion of the variance for the variable idea generation and business formation as measured using the predictor variable use of technology. The variable idea generation was determined by a dichotomous response in which respondents indicated whether they had a business idea or not. The categorical variable 'use of technology' was determined by aggregating the sub score from the section that comprises how women entrepreneurs used the emerging technology. The objective was analyzed using binary logistic regression methodology.

CHAPTER 4: RESULTS

The purpose of this research study was to explore and determine the relationship between the use of emerging technology and its motivation to generate business ideas and or business formation of women entrepreneurs in the southern region of the United States. The results of the study are depicted by the described objectives presented in the chapter.

Objective One

Objective one seeks to describe entrepreneur women in the southern region of the United States on the following demographic and business related characteristics:

1. Age
2. Ethnicity
3. Level of education
4. Type of previous business experience
5. Access to emerging technology (i.e. smart phones, tablet computers, Desktop/Laptop computers, Internet connected game console, Mp3 players, E- book readers and Social networking sites)
6. Frequency of using emerging technology (i.e. smart phones, tablet computers, Desktop/Laptop computers, Internet connected game console, Mp3 players, E- book readers and Social networking sites)
7. Type of business started

Age

Participants age was grouped into the following categories 1) 18-25; 2) 26-35; 3) 36-45; 4) 46-55; 5) 56-65; 6) 66 and above. The largest group of respondents indicated their age fell

between 26 and 35 years ($n = 11$, 29%). The second largest group indicated their age fell between 56 and 65 years ($n = 10$, 26.3%). Table 2 shows the distribution of age of respondents.

Table 2
Age Distribution of Entrepreneur Women affiliated with Women in Business Programs in the United States

| Ages in Years | n ^a | Percentage |
|---------------|----------------|------------|
| 18-25 | 1 | 2.6 |
| 26-35 | 11 | 29.0 |
| 36-45 | 7 | 18.4 |
| 46-55 | 8 | 21.1 |
| 56-65 | 10 | 26.3 |
| 66 and above | 1 | 2.6 |
| Total | 38 | 100 |

Note: Two respondents failed to respond to the age item on the survey.

^a $M = 28$; $SD = 12.9$

Ethnicity

Respondents were described based on their ethnic background. Majority of the respondents identified themselves as Caucasians ($n = 27$, 73%). The second largest group identified themselves as African American ($n = 7$, 18.9%). Table 3 below illustrates this.

Table 3
Self-Identified Ethnicity of Entrepreneur Women affiliated with Women in Business Programs in the United States

| Ethnicity | n | Percentage ^a |
|------------------|----|-------------------------|
| Caucasian | 27 | 73.0 |
| African American | 7 | 18.9 |
| Asian | 1 | 2.7 |
| Hispanic | 1 | 2.7 |
| Native American | 1 | 2.7 |
| Total | 37 | 100 |

Note: Three respondents failed to respond to the ethnicity item on the survey

a Total rounded to 100.0%

Highest Level of Education Completed

Considering the highest level of education completed, the largest group of the respondents ($n = 16$, 42.0%) reported completion of a Master's degree. The second largest group

(n = 9, 23.7%) reported Bachelors Degree as the highest level of education completed. Three respondents (7.9%) reported a doctorate as the highest level of education completed.

Table 4

Highest level of Education completed by Entrepreneur Women affiliated with Women in Business Programs in the United States

| Level of Education | n | Percentage ^a |
|--|----|-------------------------|
| Doctoral Degree (Ph.D/Ed.D) | 3 | 7.9 |
| Professional Degree (J.D./M.D./D.V.M.) | 2 | 5.3 |
| Master's Degree (MA/MS/MBA) | 16 | 42 |
| Bachelor's Degree (BA/BS) | 9 | 23.7 |
| 1 or 2 years Certificate or Associate degree | 6 | 15.8 |
| High school diploma/GED | 2 | 5.3 |
| Total | 38 | 100 |

Note: Two respondents failed to respond to the highest level of education item on the Survey

^aTotal rounded to 100.0%

Type of Previous Business Experience

In terms of previous business experience participants experience was grouped into the following categories 1) 0-5; 2) 6-10; 3) 11 and above. The largest group of respondents indicated their business experiences fell between 0 and 5 years (n = 13, 52%). The second largest group indicated their experience fell between 6 and 10 years (n = 11, 44%).

Table 5

Business experience of Entrepreneur Women affiliated with Women in Business Programs in the United States

| Experience in Years | n ^a | Percentage ^a |
|---------------------|----------------|-------------------------|
| 0-5 | 13 | 52 |
| 6-10 | 11 | 44 |
| 11 and Above | 1 | 4 |
| Total | 25 | 100 |

Note: 15 respondents indicated they had not started a business. M = 5.34 , SD = 3.71

^aTotal rounded to 100.0%

Access to Emerging Technology

Respondents were also asked if they had access to selected emerging technology. The majority of respondents (n = 37, 94.9%) reported using social networking sites such as face book

and twitter. The second largest accessible technology was smart phones such as iPhones (n = 36, 92%).

Table 6

Access to Technology of Entrepreneur Women affiliated with Women in Business Programs in the United States

| Emerging Technology | Access to Emerging Technology (%) |
|--|-----------------------------------|
| Smart phones (e.g. iPhones) | 92.5 |
| Tablet computers (e.g. Ipads) | 71.1 |
| Desktop/laptop computers | 100 |
| Internet connected game console (e.g. X-box) | 40.5 |
| Mp3 players (e.g. Ipods) | 58.3 |
| E-book readers (e.g. the kindle) | 48.6 |
| Social networking sites (e.g. facebook) | 94.9 |

Note: The percentage level are calculated as a percentage of the total number of respondents in the survey (n = 40).

Frequency of Using Emerging Technology

The Frequency of using emerging technology variable was measured based on the number of hours respondents used different emerging technologies per day (Hours/day).

i) Smart phones (e.g. iPhones)

Respondents were described based on their use of smart phones as an emerging technology.

The largest group of respondents indicated that they used the technology for up to two hours a day (n = 19, 47.5%). The second largest group used smart phones for 3 to 5 hours and 9 to 24 hours a day (Both: n = 9, 22.5%). (Table 7)

Table 7

Frequency of use of Smart Phones of Entrepreneur Women affiliated with Women in Business Programs in the United States

| No of Hours/Day | n ^a | Percentage |
|-----------------|----------------|------------|
| 0-2 | 19 | 47.5 |
| 3-5 | 9 | 22.5 |
| 6-8 | 3 | 7.5 |
| 9 and above | 9 | 22.5 |
| Total | 40 | 100 |

ii) Tablet computers (e.g. Ipads)

Majority of the respondents indicated that they used tablets computers for zero to two hours a day (n= 35, 87.5%). The second largest group used tablet computers for three to twelve hours (n= 5, 12.5%). (Table 8)

Table 8

Frequency of use of Tablet Computers of Entrepreneur Women affiliated with Women in Business Programs in the United States

| No of Hours/Day | n ^a | Percentage |
|-----------------|----------------|------------|
| 0-2 | 35 | 87.5 |
| 3 and above | 5 | 12.5 |
| Total | 40 | 100 |

iii) Desktop/Laptop Computers

Considering the frequency of use of desktops and laptop computers the highest group of respondents indicated that they used this technology for six to eight hours a day (n= 13, 32.5%). The lowest group used the desktop and lap top computers for more than twelve hours (n= 3, 7.5%). (Table 9)

Table 9

Frequency of use of Desktop/Laptop Computers of Entrepreneur Women affiliated with Women in Business Programs in the United States

| No of hours/Day | n ^a | Percentage |
|-----------------|----------------|------------|
| 0-2 | 6 | 15 |
| 3-5 | 12 | 30 |
| 6-8 | 13 | 32.5 |
| 9-11 | 6 | 15 |
| 12 and above | 3 | 7.5 |
| Total | 40 | 100 |

iv) Internet connected game console (e.g. X-box)

Respondents were also asked how many hours they use Internet connected game console (e.g. X-box) in day. Majority of the respondents indicated they did not use this technology at all

(n= 37, 92.5%). The rest of the respondents indicated that they used the technology for one to eight hour (n= 3, 7.5%) (Table 10).

Table 10

Frequency of use of Internet Connected Game Console of Entrepreneur Women affiliated with Women in Business Programs in the United States

| No of hours/Day | n ^a | Percentage |
|-----------------|----------------|------------|
| 0 | 37 | 92.5 |
| 1 | 1 | 2.5 |
| 4 | 1 | 2.5 |
| 8 | 1 | 2.5 |
| Total | 40 | 100 |

v) Mp3 players (e.g. Ipods)

Participants were also described in terms of how many hours they use Mp3 players (e.g. Ipods) in day. The largest percentage of respondents did not own the technology and hence they did not use it at all (n= 25, 62.5%). The smallest group of users used it for one to two hours a day (n= 15, 37.5%) (Table 11).

Table 11

Frequency of use of Mp3 players (e.g. Ipods) of Entrepreneur Women affiliated with Women in Business Programs in the United States

| No of hours/Day | n ^a | Percentage |
|-----------------|----------------|------------|
| 0 | 25 | 62.5 |
| 1 | 13 | 32.5 |
| 2 | 2 | 5 |
| Total | 40 | 100 |

vi) E-book readers (e.g. the kindle)

Respondents were similarly described by the number of hours they use E-book readers (e.g. the kindle). The largest percentage did not own the technology and as a result they did not use it at all (n= 28, 70%). The smallest group used the technology one to three hours in a day (n=12, 30%) (Table 12).

Table 12

Frequency of use of E-book readers (e.g. the kindle) of Entrepreneur Women affiliated with Women in Business Programs in the United States.

| No of hours/Day | n ^a | Percentage |
|-----------------|----------------|------------|
| 0 | 28 | 70 |
| 1 | 9 | 22.5 |
| 2 | 2 | 5 |
| 3 | 1 | 2.5 |
| Total | 40 | 100 |

vii) Social networking sites (e.g. facebook)

Respondents were further described in terms of the hours they use Social networking sites (e.g. facebook) per day. The largest group used the technology for zero to two hours (n= 31, 77.5%). The second largest group used social networking sites for three to five hours (n= 6, 15%) (Table 13).

Table 13

Frequency of use of Social networking sites (e.g. Facebook) of Entrepreneur Women affiliated with Women in Business Programs in the United States.

| No of hours/Day | n ^a | Percentage |
|-----------------|----------------|------------|
| 0-2 | 31 | 77.5 |
| 3-5 | 6 | 15 |
| 6-8 | 2 | 5 |
| 9 and above | 1 | 2.5 |
| Total | 40 | 100 |

Type of Business Started

To describe the type of business started respondents responses were grouped into major categories that described their business (Appendix I). Participants with businesses were grouped into the following categories Retail, Consulting and Online business and Training. The largest group of respondents indicated that their business were retail (for example real estate, gift shops, restaurants) (n=9, 36%). The second largest group was in the consulting business (for example

disability and inclusion consultant, education consulting, lobbying) (n=8, 32%). Table 14 below illustrates this

Table 14

Type of business started by Entrepreneur Women affiliated with Women in Business Programs in the United States

| Type of business | n ^a | Percentage ^a |
|------------------|----------------|-------------------------|
| Retail | 9 | 36 |
| Consulting | 8 | 32 |
| Online business | 4 | 16 |
| Training | 4 | 16 |
| Total | 25 | 100 |

Note: 15 respondents had not started a business

^a Total rounded to 100.0%

Objective Two

Objective two seeks to determine if differences exists between the extent of use of emerging technologies and selected demographic variables:

- a) Ethnicity
- b) Highest Level of education completed
- c) Marital Status
- d) Employment Status

Use of technology was recorded as an overall mean score of the question ‘please indicate how often you use the emerging technologies in performing the following tasks’. The question was a four-point anchored-type scale with response levels ranging from ‘Very Rarely’ to ‘Very Frequently’. The response ‘To Communicate’ had the highest mean score ($M = 4.67$) while ‘To seek Business Mentors’, had the lowest mean score ($M = 2.65$). The overall use of technology mean and standard deviation was $M = 3.52$ and $SD = 0.68$ respectively.

Ethnicity

Differences in use of technology scores were examined by ethnicity. The sample sizes, overall use of technology score item means and standard deviations reported by ethnicity are illustrated in Table 15 below.

Table 15
Group Sizes, Overall use of Technology Item Mean Scores, and Standard Deviation by Ethnicity for Entrepreneur Women affiliated with Women in Business Programs in the United States

| Ethnicity | n | Item mean M ^a | SD |
|-------------------------------|----|-----------------------------|-----|
| African American | 7 | 3.84 | .86 |
| American Indian/Alaska Native | 1 | 3.90 | 0 |
| Asian | 1 | 2.80 | 0 |
| Caucasian | 27 | 3.47 | .67 |
| Hispanic | 1 | 3.60 | 0 |
| Total | 37 | 3.53 | .70 |

Note: Three respondents failed to respond to the ethnicity item

^a Interpretive scale: 1.00 – 1.75 = very low use of technology; 1.76 – 2.5 = low use of technology; 2.51 – 3.25 = high use of technology; and 3.26 – 4.00 = very high use of technology.

^b Reported as overall item mean and standard deviation.

The findings illustrated in Table 16 indicate that there were no significant differences in the overall use of emerging technology between the different ethnic groups ($F, 36 = .718, p = .586$). The Levenes Test of Homogeneity of Variance revealed the presence of equal variance between the different ethnic groups ($F, 36 = 1.287, p = .265$).

Table 16
One Way Analysis of Variance Illustrating Differences in Overall use of emerging technology by Ethnicity for Entrepreneur Women affiliated with Women in Business Programs in the United States.

| | df | SS | MS | F ^a | P ^b |
|----------------|----|-------|-----|----------------|----------------|
| Between Groups | 4 | 1.45 | .36 | .71 | .58 |
| Within Groups | 32 | 16.19 | .50 | | |
| Total | 36 | 17.64 | | | |

^a One Way Analysis of Variance

^b .05 Alpha Level for the Two-Tailed Test of Significance

Highest Level of Education Completed

A comparison of the overall use of emerging technology score by the respondents highest level of education completed was undertaken through calculation of one way analysis of variance (ANOVA). The mean item score was highest for the “1 or 2 years Certificate or Associate degree” category, the score for which fell in the “highest use of technology” category in the interpretive scale (Table 17).

Table 17

Group Sizes, Overall use of Technology Item Mean Scores, and Standard Deviation by Highest Level of Education for Entrepreneur Women affiliated with Women in Business Programs in the United States

| Highest level of Education Completed | n | M ^a | SD |
|---|----|----------------|-----|
| High School Diploma/GED | 2 | 4.10 | .28 |
| 1 or 2 years Certificate/Associate degree | 6 | 4.25 | .81 |
| Bachelors Degree (BA/BS) | 9 | 3.44 | .78 |
| Masters Degree (MA/MS/MBA) | 16 | 3.37 | .49 |
| Professional Degree (J.D./M.D./D.V.M.) | 2 | 3.05 | .35 |
| Doctoral Degree (Ph.D/Ed.D) | 3 | 3.20 | .50 |
| Total | 38 | 3.53 | .69 |

Note: Two respondents failed to respond to the highest level of education item

^a Interpretive scale: 1.00 – 1.75 = very low use of technology; 1.76 – 2.5 = low use of technology; 2.51 – 3.25 = high use of technology; and 3.26 – 4.00 = very high use of technology

^b Reported as overall item mean and standard deviation

Differences emerged in the overall use of emerging technology score based on the highest level of education completed: consequently, the differences were statistically significant ($F, 37 = 2.52, p = .049$) (Table 18). The Levenes Test of Homogeneity of Variance revealed the presence of equal variance between the different groups based on highest level of education completed ($F, 37 = .54, p = .74$).

The Tukey’s post hoc analysis used to pin-point the significant differences between means revealed significant differences in the overall use of emerging technology score between those who reported having “Bachelors Degree” and those who reported having “ Professional Degree/Doctoral Degree” (mean difference = -.91).

Table 18

One Way Analysis of Variance Illustrating Differences in Overall use of emerging technology by Highest Level of Education for Entrepreneur Women affiliated with Women in Business Programs in the United States.

| | df | SS | MS | F ^a | P ^b |
|----------------|----|-------|-----|----------------|----------------|
| Between Groups | 5 | 4.99 | .99 | 2.52 | .049 |
| Within Groups | 32 | 12.65 | .39 | | |
| Total | 37 | 17.64 | | | |

^a One Way Analysis of Variance

^b .05 Alpha Level for the Two-Tailed Test of Significance

Respondents with a Bachelor's degree reported higher use of technology ($M = 3.37$) than those with a professional degree ($M = 3.05$).

Marital status

A comparison of the overall use of emerging technology score by the respondents reported marital status was also undertaken. The mean item score was highest for the "single/never married" category (Table 19).

Table 19

Group Sizes, Overall use of Technology Item Mean Scores, and Standard Deviation by Marital status for Entrepreneur Women affiliated with Women in Business Programs in the United States

| Marital status | n | Item Mean M ^a | SD |
|----------------------|----|-----------------------------|------|
| Single Never Married | 7 | 3.74 | .65 |
| Married | 22 | 3.58 | .61 |
| Divorced | 6 | 3.40 | .81 |
| Widowed | 2 | 2.85 | 1.48 |
| Total | 37 | 3.54 | .69 |

Note: Three respondents failed to respond to the highest level of education item

^a Interpretive scale: 1.00 – 1.75 = very low use of technology; 1.76 – 2.5 = low use of technology; 2.51 – 3.25 = high use of technology; and 3.26 – 4.00 = very high use of technology

^b Reported as overall item mean and standard deviation

The findings illustrated in Table 20 indicate that there were no significant differences in the overall use of emerging technology score within the groups based on marital status ($F, 36 =$

.957, $p = .42$). The Levenes Test of Homogeneity of Variance revealed the presence of equal variance between the different groups based on marital status ($F, 36 = 1.27, p = .300$).

Table 20

One Way Analysis of Variance Illustrating Differences in Overall use of emerging technology by Marital Status for Entrepreneur Women affiliated with Women in Business Programs in the United States.

| | df | SS | MS | F ^a | P ^b |
|----------------|----|-------|-----|----------------|----------------|
| Between Groups | 3 | 1.40 | .46 | .95 | .42 |
| Within Groups | 33 | 16.12 | .48 | | |
| Total | 36 | 17.53 | | | |

^a One Way Analysis of Variance

^b .05 Alpha Level for the Two-Tailed Test of Significance

Employment Status

An assessment of the overall use of emerging technology score by the respondents reported employment status was also made. The employment status was classified into Unemployed ($n = 6, 15\%$), Employed Full Time ($n = 25, 62.5\%$), Employed on Contract basis ($n = 2, 5\%$), Employed part Time ($n = 3, 7.5\%$) and Retired ($n = 2, 5\%$).

However, responses were classified into three groups; employed- consisted of respondent's full time employed, unemployed- respondents that were unemployed, and retired and part time employed- respondents that had part time employment and on contractual basis.

The mean item score was highest for the "unemployed" category (Table 21).

Table 21

Group Sizes, Overall use of Technology Item Mean Scores, and Standard Deviation by Employment Status for Entrepreneur Women affiliated with Women in Business Programs in the United States.

| Employment Status | n | M ^a | SD |
|--------------------|----|----------------|-----|
| Unemployed | 8 | 3.15 | .78 |
| Employed | 25 | 3.52 | .51 |
| Part time employed | 5 | 4.20 | .94 |
| Total | 38 | 3.53 | .69 |

Note: Two respondents failed to respond to the highest level of education item

^a Interpretive scale: 1.00 – 1.75 = very low use of technology; 1.76 – 2.5 = low use of technology; 2.51 – 3.25 = high use of technology; and 3.26 – 4.00 = very high use of technology

^b Reported as overall item mean and standard deviation

Even though the respondents groups compared had small numbers differences emerged in the overall use of emerging technology score based on the employment status of respondents: consequently, the differences were statistically significant ($F, 37 = 4.17, p = .02$). The Levenes Test of Homogeneity of Variance revealed the presence of equal variance between the different groups based on the respondents employment status ($F, 37 = 1.78, p = .18$).

Table 22

One Way Analysis of Variance Illustrating Differences in Overall use of emerging technology by Employment status for Entrepreneur Women affiliated with Women in Business Programs in the United States

| | df | SS | MS | F ^a | P ^b |
|----------------|----|-------|------|----------------|----------------|
| Between Groups | 2 | 3.39 | 1.69 | 4.173 | .02 |
| Within Groups | 35 | 14.25 | .40 | | |
| Total | 37 | 17.64 | | | |

^a One Way Analysis of Variance

^b .05 Alpha Level for the Two-Tailed Test of Significance

The post hoc Tukey analysis conducted to identify the significant differences between means revealed significant differences in the overall use of emerging technology score between those who reported being “part time employed” and those who reported being “unemployed” (mean difference = -1.05). Thus respondents who were part time employed ($M = 4.2$) used technology more than the unemployed ($M = 3.15$).

Objective Three

Objective three seeks to determine if differences exists between the perceived use of emerging technologies and the following variables:

1. Ethnicity
2. Highest Level of education completed
3. Marital Status
4. Employment Status
5. Business ownership

Ethnicity

Further analysis to determine the overall perceived use of technology by ethnicity was conducted. To improve the output analysis of the respondents the variable was recorded into two groups; Caucasian and others (African American, American Indian or Alaska, Asian and Hispanic). Caucasians had a higher overall mean score ($M = 3.018$) than all the other ethnic groups ($M = 2.587$).

Table 23

Group Sizes, Overall perceived use of Technology Item Mean Scores, and Standard Deviation by Ethnicity for Entrepreneur Women affiliated with Women in Business Programs in the United States

| Ethnicity | n | M ^a | SD |
|-----------|----|----------------|-----|
| Caucasian | 27 | 3.01 | .77 |
| Others | 10 | 2.58 | .92 |
| Total | 37 | 2.90 | .82 |

Note: Three respondents failed to respond to ethnicity

^a Interpretive scale: 1.00 – 1.75 = very low perceived use of technology 1.76 – 2.5 = low perceived use of technology; 2.51 – 3.25 = high perceived use of technology; and 3.26 – 4.00 = very high perceived use of technology

^b Reported as overall item mean and standard deviation

The findings illustrated in Table 24 indicate that there were no significant differences in the overall perceived use of emerging technology score within the groups based on ethnicity ($F, 36 = .2033, p = .163$). The Levenes Test of Homogeneity of Variance revealed the presence of equal variance between the different groups based on ethnicity ($F, 36 = .390, p = .536$).

Table 24

One Way Analysis of Variance Illustrating Differences in Overall perceived use of emerging technology by Ethnicity for Women affiliated with Women in Business Programs in the United States.

| | df | SS | MS | F ^a | P ^b |
|----------------|----|-------|------|----------------|----------------|
| Between Groups | 1 | 1.35 | 1.35 | 2.033 | .16 |
| Within Groups | 35 | 23.33 | .66 | | |
| Total | 36 | 24.69 | | | |

^a One Way Analysis of Variance

^b .05 Alpha Level for the Two-Tailed Test of Significance

Highest Level of Education Completed

Differences between the overall perceived use of technology by highest level of education were analyzed. Two categories combining educational levels were created. High school diploma (less than high school diploma and high school diploma/GED) and Post Bachelor's Degree (master's degree/professional degree and doctoral degree). The mean item score was highest for the "High School Diploma" category, the score for which fell in the "perceived highest use of technology" category in the interpretive scale (Table 25)

Table 25

Group Sizes, Overall Perceived use of Technology Item Mean Scores, and Standard Deviation by Highest Level of Education for Entrepreneur Women affiliated with Women in Business Programs in the United States

| Highest level of Education Completed | n | M ^a | SD |
|---|----|----------------|------|
| High School Diploma/GED | 2 | 3.12 | .17 |
| 1 or 2 years Certificate/Associate degree | 6 | 2.50 | 1.16 |
| Bachelor's Degree (BA/BS) | 9 | 3.02 | .89 |
| Post Bachelor's Degree | 18 | 3.06 | .64 |
| Total | 35 | 2.96 | .80 |

Note: Five respondents failed to respond to Highest Education Completed

^a Interpretive scale: 1.00 – 1.75 = very low perceived use of technology 1.76 – 2.5 = low perceived use of technology; 2.51 – 3.25 = high perceived use of technology; and 3.26 – 4.00 = very high perceived use of technology

^b Reported as overall item mean and standard deviation

The findings illustrated in Table 26 indicate that there were no significant differences in the overall use of emerging technology based on the highest level of education ($F, 34 = .808, p = .499$). The Levenes Test of Homogeneity of Variance revealed the presence of equal variance between the different ethnic groups ($F, 34 = 2.017, p = .132$).

Table 26

One Way Analysis of Variance Illustrating Differences in Overall perceived use of emerging technology by Highest Level of Education for Women affiliated with Women in Business Programs in the United States.

| | df | SS | MS | F ^a | P ^b |
|----------------|----|-------|-----|----------------|----------------|
| Between Groups | 3 | 1.58 | .52 | .808 | .49 |
| Within Groups | 31 | 20.21 | .65 | | |
| Total | 34 | 21.79 | | | |

^a One Way Analysis of Variance

^b.05 Alpha Level for the Two-Tailed Test of Significance

Marital Status

A further comparison of the overall perceived use of emerging technology score by the respondents reported marital status was also undertaken. Respondents (Table 27) indicated whether they were Single Never Married (n = 7, 17.5%), Married (n = 22, 55%), Living with Significant Other (None) Separated (None), divorced (n = 6, 15%), or widowed (n = 2, 5%). The respondents were recorded into two categories “Married” and “Non Married”. The mean item score was highest for the “Married” category.

Table 27

Group Sizes, Overall Perceived use of Technology Item Mean Scores, and Standard Deviation by Marital status for Entrepreneur Women affiliated with Women in Business Programs in the United States

| Marital status | n | Item Mean M ^a | SD |
|----------------|----|-----------------------------|-----|
| Non Married | 15 | 2.74 | .90 |
| Married | 22 | 3.01 | .77 |
| Total | 37 | 2.90 | .82 |

Note: Three respondents failed to respond to the highest level of education item

^a Interpretive scale: 1.00 – 1.75 = very low perceived use of technology 1.76 – 2.5 = low perceived use of technology; 2.51 – 3.25 = high perceived use of technology; and 3.26 – 4.00 = very high perceived use of technology

^b Reported as overall item mean and standard deviation

Table 28 indicate that there were no significant differences in the overall perceived use of emerging technology score within the groups based on marital status (F, 35 = .944, p = .338).

Table 28

One Way Analysis of Variance Illustrating Differences in Overall perceived use of emerging technology by Marital Status for Women affiliated with Women in Business Programs in the United States.

| | df | SS | MS | F ^a | P ^b |
|----------------|----|-------|-----|----------------|----------------|
| Between Groups | 1 | .64 | .64 | .944 | .33 |
| Within Groups | 35 | 24.04 | .68 | | |
| Total | 36 | 24.69 | | | |

^a One Way Analysis of Variance

^b .05 Alpha Level for the Two-Tailed Test of Significance

The Levenes Test of Homogeneity of Variance revealed the presence of equal variance between the different groups based on marital status ($F, 36 = .734, p = .397$).

Employment status

Overall perceived use of emerging technology score was analyzed based on the respondents reported employment status. Responses were classified into three groups; employed- consisted of respondent's full time employed, unemployed- respondents that were unemployed, and retired and part time employed- respondents that had part time employment and on contractual basis.

The mean item score was highest for the "Employed" category (Table 29).

Table 29

Group Sizes, Overall Perceived Use of Technology Item Mean Scores, and Standard Deviation by Employment Status for Entrepreneur Women affiliated with Women in Business Programs in the United States.

| Employment Status | n | M ^a | SD |
|--------------------|----|----------------|------|
| Unemployed | 8 | 2.98 | .42 |
| Employed | 25 | 3.00 | .78 |
| Part time employed | 5 | 2.25 | 1.26 |
| Total | 38 | 2.90 | .69 |

Note: Two respondents failed to respond to the highest level of education item

^a Interpretive scale: 1.00 – 1.75 = very low perceived use of technology; 1.76 – 2.5 = low perceived use of technology; 2.51 – 3.25 = high perceived use of technology; and 3.26 – 4.00 = very high perceived use of technology

^b Reported as overall item mean and standard deviation

Table 30 indicate that there were no significant differences in the overall perceived use of emerging technology score within the groups based on respondents employment status ($F, 35 = 1.923, p = .161$).

Table 30

One Way Analysis of Variance Illustrating Differences in Overall perceived use of emerging technology by Employment Status for Women affiliated with Women in Business Programs in the United States.

| | df | SS | MS | F ^a | P ^b |
|----------------|----|-------|------|----------------|----------------|
| Between Groups | 2 | 2.44 | 1.22 | 1.92 | .16 |
| Within Groups | 35 | 22.24 | .63 | | |
| Total | 37 | 24.69 | | | |

^a One Way Analysis of Variance

^b .05 Alpha Level for the Two-Tailed Test of Significance

The Levenes Test of Homogeneity of Variance revealed the presence of equal variance between the different groups based on employment status ($F, 37 = 3.111, p = .057$).

Business Ownership

A comparison of the overall perceived use of technology was undertaken between those who had started a business and those who had not through calculation of one way analysis of variance (ANOVA). The mean item score for business owners was slightly lower than that for Non business owners, though both fell in the “high perceived use of technology” category in the interpretive scale (Table 31).

Table 31
Group Sizes, Overall Perceived use of Technology Item Mean Scores, and Standard Deviation by Business Ownership for Entrepreneur Women affiliated with Women in Business Programs in the United States.

| Ownership | n | M ^a | SD |
|---------------------|----|----------------|-----|
| Business Owners | 23 | 2.72 | .83 |
| Non Business Owners | 15 | 3.16 | .73 |
| Total | 38 | 2.90 | .81 |

^a Interpretive scale: 1.00 – 1.75 = very low perceived use of technology 1.76 – 2.5 = low perceived use of technology; 2.51 – 3.25 = high perceived use of technology; and 3.26 – 4.00 = very high perceived use of technology

^b Reported as overall item mean and standard deviation

Table 32 indicate that there were no significant differences in the overall perceived use of emerging technology score within the groups based on Business ownership ($F, 36 = 2.738, p = .107$). The Levenes Test of Homogeneity of Variance revealed the presence of equal variance between the different groups based on business ownership ($F, 37 = .622, p = .435$).

Table 32
One Way Analysis of Variance Illustrating Differences in Overall perceived use of emerging technology by Business Ownership for Women affiliated with Women in Business Programs in the United States.

| | df | SS | MS | F ^a | P ^b |
|----------------|----|-------|------|----------------|----------------|
| Between Groups | 1 | 1.74 | 1.74 | 2.73 | .10 |
| Within Groups | 36 | 22.94 | .63 | | |
| Total | 37 | 24.69 | | | |

^a One Way Analysis of Variance

^b .05 Alpha Level for the Two-Tailed Test of Significance

Objective Four

The objective sought to determine, if a model exists which would predict the variable idea generation and starting a business, as measured by the variable use of technology overall item mean score. Respondent's scores from the question 'how much respondents used technology in various tasks' were summed up to obtain the overall use of technology score. The independent variable in the binary logistic regression was an overall item mean score of responses indicating the extent of use of technology.

Binary logistic equations are used when making predictions on the presence or absence of a parameter based on certain chosen independent predictors which are categorical, ordinal or binary (Dascalu, Carausu, & Manuc, 2008). The function is formulated to predict and explain a binary (two group) categorical variable rather than a metric dependent measure (Hair, Black, Babin, Anderson, & Tatham, 2006). The dependent variable idea generation and business formation are binary; therefore, logistic regression is the preferred analysis (Hair et al., 2006). The study predicts the presence or absence of business idea generation and or business formation based on the independent categorical variable use of technology.

Idea Generation

A dichotomous dependent variable was created from the question "do you have a business idea/or intend to start a business in the future?" The variable took on the values one and two, '1' if they have a business idea and '2' otherwise. The Hosmer-Lemeshow test for goodness of fit shows that the chi-square value is 6.34 with a corresponding p-value = 0.274. Therefore, the chi-square value is not significant, and this demonstrates that the model is a good fit. Table 33 provides a description of the cases analyzed, there were 15 cases, one was missing or unselected.

Table 33

Group Cases for Nascent Entrepreneur Women affiliated with Women in Business Programs in the United States.

| Unweighted Cases | N | Percentage |
|----------------------|----|------------|
| Included in Analysis | 15 | 100 |
| Missing Cases | 0 | |
| Total | 15 | 100 |
| Unselected Cases | 0 | |
| Total | 15 | 100 |

. The classification table (Table 34) shows the overall percentage of those correctly classified is equal to 60%. This indicates that the predictor model correctly classifies 60% of the cases.

Table 34

Group Cases for Nascent Entrepreneur Women affiliated with Women in Business Programs in the United States with or without Business Ideas.

| | | Predicted | | Percentage |
|---|-----|-----------|----|------------|
| Observed | | Yes | No | Correct |
| Do you have a business idea | Yes | 9 | 0 | 100 |
| or/and intend to start a business in the future | No | 6 | 0 | .0 |
| Overall Percentage | | | | 60.0 |

^aThe cut value is .500

The variable in the equation table (table 35) was used to interpret previous fit statistics and assess the evidence in the data if the model is significant. Based on the output B unit is - 2.615 which means that given an increase of technology use by one unit, we can expect the log odds (logit) of generating a business idea to decrease by -2.615, controlling for all other factors. The model is also has a standard error of 1.44 and it is non-significant ($p = 0.071$). The odds of an event occurring is also represented by the exponential B coefficient ($\text{Exp} = .07$). This means that an increase of one unit on use of technology increases the odds of generating an idea by .07. The overall model therefore indicates that after controlling for other factors the variable use of

technology does not predict the response variable ‘Do you have a business idea or/and intend to start a business in the future?’ better than chance alone (Table 35).

Table 35

Bilateral Logistic Regression Illustrating prediction of Idea Generation based on the variable Use of Technology for Women affiliated with Women in Business Programs in the United States

| | B | S.E. | Wald | Sig. | Exp(B) |
|-----------|-------|------|------|------|---------|
| Useoftech | -2.61 | 1.44 | 3.26 | .07 | .07 |
| Constant | 8.72 | 5.03 | 3.00 | .08 | 6123.48 |

^aVariable(s) entered on step 1: useoftech

Business Formation

A dichotomous dependent variable was created from the question “Have you started a business?” The variable took on the values one and zero, ‘1’ if they have a business and ‘2’ otherwise. Table 36 provides a description of the cases analyzed, there were 40 cases, one was missing or unselected.

Table 36

Group Cases for Entrepreneur Women affiliated with Women in Business Programs in the United States.

| Unweighted Cases | N | Percentage |
|----------------------|----|------------|
| Included in Analysis | 40 | 100 |
| Missing Cases | 0 | |
| Total | 40 | 100 |
| Unselected Cases | 0 | |
| Total | 40 | 100 |

The Hosmer-Lemeshow test for goodness of fit shows that the chi-square value is 15.725 with a corresponding p-value = 0.046. Therefore, the chi-square value is significant at 0.05, and this demonstrates that the model is not a good fit. The classification table shows the overall percentage of those correctly classified is equal to 62.5%. This indicates that the predictor model correctly classifies 62.5% of the cases (table 37).

Table 37

Group Cases for Entrepreneur Women affiliated with Women in Business Programs in the United States with or without a Business.

| | | Predicted | | Percentage |
|-----------------------------|-----|-----------|----|------------|
| Observed | | Yes | No | Correct |
| Have you started a business | Yes | 25 | 0 | 100 |
| | No | 15 | 0 | .0 |
| Overall Percentage | | | | 62.5 |

^aThe cut value is .500

Based on the output B unit is .109 which means that given an increase of technology use by one unit, we can expect the log odds (logit) of creating a business to increase by .109, controlling for all other factors. The model is also has a standard error of 1.44 and it is non-significant ($p = 0.822$). The odds of an event occurring is also represented by the exponential B coefficient ($\text{Exp} = 1.115$). This means that an increase of one unit on use of technology increases the odds of forming a business by 1.115. Therefore the overall model indicates that after controlling for other factors the variable use of technology does not predict the response variable 'have you started a business?' better than chance alone (Table 38)

Table 38

Bilateral Logistic Regression Illustrating prediction Business formation based on the variable Use of Technology for Women affiliated with Women in Business Programs in the United States

| | B | S.E. | Wald | Sig. | Exp(B) |
|-----------|-------|-------|------|------|--------|
| Useoftech | .109 | .486 | .050 | .82 | 1.115 |
| Constant | -.896 | 1.749 | .263 | .60 | .408 |

^aVariable(s) entered on step 1: useoftech

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

Purpose of the Study

The purpose of this research study is to determine the relationship between the extent of use of emerging technology in business and different characteristics that motivate entrepreneurial women in Louisiana to generate business ideas. The objectives of this study are:

1. To describe women entrepreneurs on the following demographic and business related variables:
 - a) Age
 - b) Ethnicity
 - c) Level of education
 - d) Type of previous business experience
 - e) Access to emerging technology (i.e. smart phones, tablet computers, Desktop/Laptop computers, Internet connected game console, Mp3 players, E- book readers and Social networking sites)
 - f) Frequency of using emerging technology (i.e. smart phones, tablet computers, Desktop/Laptop computers, Internet connected game console, Mp3 players, E- book readers and Social networking sites)
 - g) Type of business started
2. To determine if differences exists between the extent of use of emerging technologies and the following variables:
 - a) Ethnicity
 - b) Highest Level of education completed
 - c) Marital Status

d) Employment Status

3. To determine if differences exists between the perceived use of emerging technologies and the following variables:

a) Ethnicity

b) Highest Level of education completed

c) Marital Status

d) Employment Status

e) Business ownership

5. To determine if a model exists which would predict idea generation and business formation, as measured by use of technology overall item mean score

Procedure

The study target participant was women who were aiming to start their own businesses and/or women who had already started a business within the past 5 years. However, accessible population was women who participated in Women in Business (WIB) seminar event during the years 2006 – 2010 in Louisiana sponsored by a large research university in the southeastern portion of the United States.

The survey consisted of three sections, user knowledge and use of emerging technologies, importance of emerging technology in starting or generating a business idea and behavioral perceptions on use of emerging technologies.

The first two sections of the questionnaire were created based on an extensive literature review and the third section consisted of items drawn from an existing instrument. The instrument also included a section designed to implore the demographic information of the respondents. Subject matter experts in fields such as distance learning and evaluation, social

science research, women entrepreneurship and management further reviewed the questionnaire. Additionally feedback was sought from women with diverse educational and business background who responded to the questionnaire and offered feedback as to the necessity, relevance, structure, and clarity of each of the questions and instructions. Appropriate revisions were made to the instrument based on the input of the experts with regard to the presentation, content and overall structure of the questions.

The questionnaire was administered via an online survey system (© SurveyMonkey). A total of 283 women entrepreneurs provided usable emails in the Women In Business “brown bag lunch” speaker and networking events were invited to participate in this study. The final response count was 40 representing a 14.13% response rate.

Summary of Major Findings

Objective One

Age – The results indicated that the majority of respondents were middle-aged and old age. The two largest groups of respondents indicated their age fell between 26 and 35 years (n = 11, 29%), and 55 and 65 years (n = 10, 26.3%).

Ethnicity – The majority of respondents identified themselves as Caucasians (n = 27, 73%). The next largest group identified themselves as African Americans (n = 7, 18.9%).

Highest level of education completed – Most of the respondents reported completing at least a Master’s degree. Respondents with a Master’s degree comprised the largest group (n = 16, 42%), followed by 23.7% (n = 9) who reported having completed a Bachelor’s degree.

Type of previous business experience- majority of respondents reported having more than one year in business experience. The two largest groups indicated that their experience fell between 0 and 5 years (n= 13, 52%) and 6 to 10 years (n= 11, 44%)

Access to emerging technology- The results indicated that the majority of respondents used Desktops/Laptop computers as well as Social Networking sites. 100% (n= 40) of the respondents use Desktop/Laptop computers while 94% (n = 37) use social networking sites.

Frequency of using emerging technology- The results were reported based on each emerging technology. The highest numbers of responders indicated that they used Smart Phones for a maximum of two hour a day (n= 19, 47%). On the other hand 87% (n= 35) indicated they also used Tablet computers for a maximum of two hours. The largest group of respondents indicated that they also used Desktops/Laptops between 6 and 8 hours (n = 13, 32%). As for Internet connected game console (n= 37, 92%), Mp3 players (n= 25, 62%) and E-book readers (n= 28, 70%) majority of the respondent indicated they did not use the technology at all. However Social Networking Sites were used by majority of respondents for a maximum of two hours a day (n= 31, 77%).

Type of business started- Respondents pointed out their involved in different type of businesses. The largest number indicated they were in the retail business (n=9, 36%) while the second largest was in business consulting (n= 8, 32%).

Objective Two

Ethnicity – There were no significant differences in the overall use of emerging technology score within the reported ethnic groups ($F, 37 = .718, p = .586$).

Highest level of education completed - The differences in the overall use of technology score between groups based on the highest level of education completed were statistically significant ($F, 37 = 2.527, p = .049$). From the Tukey's post hoc analysis significant differences occurred in the overall use of emerging technology score between those who reported having

“Bachelors Degree” and those who reported having “ Professional Degree/Doctoral Degree” (mean difference = -.91).

Marital status - There were no significant differences in the overall use of emerging technology score within the groups based on marital status ($F, 37 = .957, p = .424$).

Employment status - Differences emerged in the overall use of emerging technology score based on the employment status of respondents: consequently, the differences were statistically significant ($F, 37 = 4.173, p = .024$). From the post hoc Tukey analysis significant differences were evident in the overall use of emerging technology score between those who reported being “part time employed” and those who reported being “ unemployed” (mean difference = -1.05).

Objective Three

Ethnicity – There were no significant differences in the overall perceived use of emerging technology score within the reported ethnic groups ($F, 37 = .2.033, p = .163$).

Highest level of education completed – There was no significant differences in the overall perceived use of emerging technology based on the highest level of education ($F, 35 = .808, p = .499$).

Marital status- There were no significant differences in the overall perceived use of emerging technology score within the groups based on marital status ($F, 36 = .944, p = .338$).

Employment status- There were no significant differences in the overall perceived use of emerging technology score within the groups based on respondents employment status ($F, 37 = 1.923, p = .161$).

Business ownership- There were no significant differences in the overall perceived use of emerging technology score within the groups based on Business ownership ($F, 37 = 2.738, p = .107$).

Objective Four

No exploratory model was found to predict both idea generation and business formation status mean score from selected variables use of technology. However, both models (Idea generation and business formation) revealed that by increasing technology use by one unit, we can expect the odds of generating a business idea or creating a business to increase by 0.07 and 1.115 respectively, controlling for all other factors.

Conclusions

Conclusion One

The women entrepreneur respondents to this study were predominantly Caucasian (73%), over 26 years of age (97%), majority with up to 5 years of business experience (52%), with access to technology (92.5%), have a Bachelor's degree or higher educational level (78.9%), involved in retail business (36%) and are in full-time employment (62.5%). This responses are in line with typical demographic information of women entrepreneur studies. Carter et al., (2003) and Morris et al. (2006) women entrepreneur studies found that respondents were over the age of 25, had a college or higher level of education and respondents were primarily Caucasian. In addition, the studies showed that most businesses had been operational for eight years and majority were in retail business.

Whereas the study provides valuable information on women entrepreneur, the results can only be generalized to the responding population. This is atypical of general women entrepreneur population. It is recommended that the study be conducted with a bigger number of general

women entrepreneur population who may be diverse with regards to the above mentioned demographic variables.

Conclusion Two

Significant differences were observed in the overall use of technology mean score based on highest education achieved and employment status. Tukey's statistical results show that the respondents were likely to use technology more frequently if they had a 'bachelor's degree' rather than a 'professional degree'. Additionally respondents that were 'part time employed' used technology more frequently than the 'unemployed'. Research conducted by Czaja et al. (2006) with aim of understanding the use of technology among community-dwelling adults indicates that younger people had higher levels of fluid intelligence and education, and had lower levels of anxiety about technology were more likely to use technology more. Therefore, age differences that may exist between those with bachelors and professional degree may explain the overall difference in use between the variables. On the other hand, Bureau of Labor Statistics (2013) reports that because of economic condition there is an increase of part time employees in the job market since the year 2012. A large section of the part time employees would like to be full time but cannot find full time employment (Bureau of Labor Statistics, 2013). Therefore, the increased use of technology among 'part time employed' may be because of searching for better occupation or striving to look for ideas via emerging technology. It is recommended that this survey be administered to a larger group of part time employed and unemployed to investigate the demographic variables that contribute to differences in use of technology when developing a business idea. Also, it is recommended that both male and female population should be sampled to understand ways in whether gender differences exist in terms of use of technology to generate business ideas based on different demographic characteristics.

Conclusion Three

Even though the binary logistic regression model was found not to predict the variables idea generation and business formation, other underlying outcomes of the model were noted. The derived model on business formation variable indicated that increased use of technology leads to the odds of creating a business to increase when all other factors are controlled. The role of entrepreneurship as stated earlier in the country is a critical phenomenon that can sustain economic growth (Kuratko, 2003; Sargeant & Moutray, 2010). Therefore, the underlying outcomes noted in the model create a platform in which to expand the study and understand how increased use of technology among women entrepreneurs can enhance business formation, which in turn affects the countries entrepreneurship level positively. Research by Rainie & Fox (2012) indicated that 41% and 35% of cellphone users use it to coordinate functions and solve an unexpected problem that they or someone else had encountered respectively. This indicates that people are using emerging technologies as the to go to sources for information and this in essence may lead to solving problems while at the same time positively affecting business formation. In addition women research is also scarce hence this study adds on to the literature in women entrepreneurship specifically focusing on the relationships between emerging technology and idea generation and/or business formation.

Since there is no literature addressing the contributions of emerging technology on business ideas and business formation, our recommendation is to further expand the study to factor in both male and female nascent and start up entrepreneurs and to focus on newly formed businesses and the role emerging technology plays in their success.

Implications and Recommendations

Job creation is a major factor in today's economy (Berglann, Moen, Roed, & Skogstrom, 2011). Therefore, startup businesses and ideas that can lead to job creation are a major component of the economic growth (Mitchell, 2011). Even though women owned businesses are still in the minority compared to men, there has been a visible growth of 19.8% compared to the overall growth rate of 10.3 percent for U.S. firms (Robb & Coleman, 2009). Even with this growth research indicates that there is not only limited recognition of women entrepreneurs as major contributors of economic growth in many economies but also studies of women in entrepreneurship is incomprehensive and more research to understand this field is necessary (Delmar & Holmquist, 2004; Mitchell, 2011). Even though this study focuses on women who participated in WIB seminars in Louisiana the database is based on a period (2006 – 2010) affected by natural disasters such as Katrina and hence some of the respondents businesses may have moved to other states. This study therefore contributes to women entrepreneur research by looking at ways in which emerging technology can support the formation of businesses. The study provides an initial platform to understand how emerging technology relates to growth of women business ideas and startups. This adds to the incomprehensive women entrepreneur research (Delmar & Holmquist, 2004; Mitchell, 2011) and provides research opportunity for scholars to further test variables that are related to entrepreneurship and emerging technology.

As an initial framework, that focuses on women entrepreneurs and emerging technology, this study has both a practical and theoretical contribution. Theories in academic fields are accounts of social processes that emphasize empirical tests of the likelihood of the narrative as well as paying attention to the scope condition of the account (DiMaggio, 1995; Randall, 1981). This study therefore contributes to the holistic research of entrepreneurial theory by introducing

a quantitative model that utilizes Technology Acceptance Model and Dynamic capabilities in relating the use of emerging technologies to business formation.

Entrepreneurship affects the growth of an economy in many ways such as job creation, economic growth, new business formation and talent and innovation (Berglann, Moen, Roed, & Skogstrom, 2011). Therefore, different practitioners take part in the entrepreneurship process both directly and indirectly. This study provides material for academic and professional interests in expanding their knowledge on ways in which emerging technology affects business among women entrepreneurs. Thus enhancing the critical thinking skills for students or clients in entrepreneurship field as well as expanding new areas of research for the involved scholars.

To build on the research, future studies should examine the antecedents of use of technology. Use of emerging technology according to the study differs from one device to another. Therefore, understanding the issues leading up to higher frequency use of some emerging technologies and not others is an area of research interest. In addition, the model should be tested using both genders and any differences highlighted. Further work should also build on the framework by exploring differences in in business idea generation between respondents that had high emerging technology use and those that had low use of emerging technology.

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APPENDIX A: INSTITUTIONAL REVIEW BOARD APPROVAL

Application for Exemption from Institutional Oversight

Unless qualified as meeting the specific criteria for exemption from Institutional Review Board (IRB) oversight, ALL LSU research/ projects using living humans as subjects, or samples, or data obtained from humans, directly or indirectly, with or without their consent, must be approved or exempted in advance by the LSU IRB. This Form helps the PI determine if a project may be exempted, and is used to request an exemption.



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-- Applicant, Please fill out the application in its entirety and include the completed application as well as parts A-F, listed below, when submitting to the IRB. Once the application is completed, please submit two copies of the completed application to the IRB Office or to a member of the Human Subjects Screening Committee. Members of this committee can be found at <http://research.lsu.edu/CompliancePoliciesProcedures/InstitutionalReviewBoard%28IRB%29/item24737.html>

-- A Complete Application Includes All of the Following:

(A) Two copies of this completed form and two copies of parts B thru F.

(B) A brief project description (adequate to evaluate risks to subjects and to explain your responses to Parts 1&2)

(C) Copies of all instruments to be used.

*If this proposal is part of a grant proposal, include a copy of the proposal and all recruitment material.

(D) The consent form that you will use in the study (see part 3 for more information.)

(E) Certificate of Completion of Human Subjects Protection Training for all personnel involved in the project, including students who are involved with testing or handling data, unless already on file with the IRB. Training link: (<http://phrp.nihtraining.com/users/login.php>)

(F) IRB Security of Data Agreement: (<http://research.lsu.edu/files/item26774.pdf>)

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E-mail: ending1@tigers.lsu.edu

2) Co Investigator(s): please include department, rank, phone and e-mail for each
*If student, please identify and name supervising professor in this space

IRB# E 8029 LSU Proposal # _____

- ☒ Complete Application
- ☒ Human Subjects Training

3) Project Title: Use and access of emerging technology impact: A study of women entrepreneurs in the southern region of the United States

Study Exempted By:
Dr. Robert C. Mathews, Chairman
Institutional Review Board
Louisiana State University
203 B-1 David Boyd Hall
225-578-8692 | www.lsu.edu/irb
Exemption Expires: 11/5/2015

4) Proposal? (yes or no) No

If Yes, LSU Proposal Number

Also, if YES, either

☐ This application completely matches the scope of work in the grant

OR

☐ More IRB Applications will be filed later

5) Subject pool (e.g. Psychology students) Women over the age of 18 who are entrepreneurs

*Circle any "vulnerable populations" to be used: (children <18; the mentally impaired, pregnant women, the aged, other). Projects with incarcerated persons cannot be exempted.

6) PI Signature [Signature]

Date 11/01/2012 (no per signatures)

** I certify my responses are accurate and complete. If the project scope or design is later changes, I will resubmit for review. I will obtain written approval from the Authorized Representative of all non-LSU institutions in which the study is conducted. I also understand that it is my responsibility to maintain copies of all consent forms at LSU for three years after completion of the study. If I leave LSU before that time the consent forms should be preserved in the Departmental Office.

Screening Committee Action: Exempted ☒ Not Exempted ☐ Category/Paragraph 3

Signed Consent Waived? Yes/No

Reviewer Mathews

Signature [Signature]

Date 11/6/12

APPENDIX B: RESEARCH INSTRUMENT

EMERGING TECHNOLOGY ENTREPRENEUR SURVEY

SECTION 1: USER KNOWLEDGE AND USE OF EMERGING TECHNOLOGIES

- 1. Have you ever participated in any Women in Business Program activities in Louisiana State University (Response: Y/N)**
- 2. Which of the following emerging technologies do you own or have access to? (Response: Y/N)**
 1. Smart phones (for example i-phones)
 2. Tablet computers (for example i-pads)
 3. Desktop computers
 4. Laptop computers
 5. Internet connected game console (for example x-box)
 6. Mp3 players (for example I-pods)
 7. E- book readers (ie the kindle)
 8. Social networking sites (i.e. Facebook and twitter)
 9. others
- 3. Approximately how many hours per day do you use the following emerging technologies?**
Smart phones (for example i-phones) (Response: No of hours)
 1. Smart phones (for example i-phones)
 2. Tablet computers (for example i-pads)
 3. Desktop computers
 4. Laptop computers
 5. Internet connected game console (for example x-box)
 6. Mp3 players (for example I-pods)
 7. E- book readers (ie the kindle)
 8. Social networking sites (i.e. Facebook and twitter)
 9. others
- 4. Please indicate how often you use the emerging technologies in performing the following tasks (Response: Very Rarely, Rarely, Occasionally, Frequently and Very Frequently)**
 1. To communicate
 2. To search for entrepreneurial ideas
 3. To establish business connections
 4. To conduct business activities
 5. To seek business mentors
 6. For leisure/entertainment
 7. Create or work on an online business
 8. To socialize

5. In what ways do you use social media sites (e.g. Facebook, twitter) in developing business ideas or in developing your current business. For example advertising, developing business networks e.t.c (Response: Statement)

SECTION 2: IMPORTANCE OF EMERGING TECHNOLOGY IN STARTING A BUSINESS OR GENERATING A BUSINESS IDEA

6. Have you started a business? (Response: Y/N)

If you have started a business;

7. Please describe the type of business venture you have started (Response: statement)
8. How many years has your business been in operation? (Response: statement)
9. Which year did you start your business? (Response: statement)

If you have not started a business;

10. Do you have a business idea or/and intend to start a business in the future?(Response Y/N)

If Yes;

11. Please describe the area of business you aspire to venture into (Response: statement)

For respondent with an established business

12. Please indicate the importance of the following emerging technologies in generating the idea that started your business (Response: Unimportant, Of little importance, moderately important, important and very important)

1. Smart phones (for example i-phones)
2. Tablet computers (for example i-pads)
3. Desktop computers
4. Laptop computers
5. Internet connected game console (for example x-box)
6. Mp3 players (for example I-pods)
7. E- book readers (ie the kindle)
8. Social networking sites (i.e. Facebook and twitter)
9. others

For respondents with a business idea

13. Please indicate the importance of the following emerging technologies in developing your business idea (Response: Unimportant, Of little importance, moderately important, important and very important)

1. Smart phones (for example i-phones)
2. Tablet computers (for example i-pads)
3. Desktop computers
4. Laptop computers
5. Internet connected game console (for example x-box)
6. Mp3 players (for example I-pods)
7. E- book readers (ie the kindle)

8. Social networking sites (i.e. Facebook and twitter)
9. others

SECTION 3: BEHAVIORAL PERCEPTIONS ON USE OF EMERGING TECHNOLOGIES

14. Please indicate your agreement with each of the statements (Response: Strongly disagree, Disagree, Agree and Strongly agree)

1. I will use emerging technology in generating business venture ideas
2. I have used emerging technology to generate business venture ideas
3. Emerging technology is useful in triggering new business ideas
4. I receive useful entrepreneurial ideas from emerging technologies
5. Emerging technology is an easy way to trigger new business ideas
6. Emerging technologies are enjoyable to use
7. Incentives to use emerging technologies are necessary for me to use it to develop business ideas
8. I would recommend use of emerging technologies for developing business ideas

Section 4: Demographics

Please provide the following information. This information is intended to help the researcher understand how these factors are related to women entrepreneurs' efforts to start businesses. The information you provide is completely CONFIDENTIAL.

Your Ethnicity African American
 American Indian or Alaska Native
 Asian
 Caucasian
 Hispanic
 Native Hawaiian or other pacific islanders
 Other (specify: _____)

Highest education level achieved Less than High School Diploma
 Highschool diploma/GED
 1 or 2 years Certificate or Associate degree
 Bachelors Degree (BA/BS)
 Masters Degree (MA/MS/ MBA)
 Professional Degree (J.D./M.D./D.V.M.)
 Doctoral Degree (Ph.D/Ed.D)

Your current marital status Single Never Married
 Married
 Living with significant other

Separated
Divorced
Widowed
Other (specify: _____)

Current employment status (if any) other than your entrepreneurial business venture

Unemployed
Employed Full Time
Employed on a Contract Basis
Employed Part Time
Retired

If employed (Full Time, On Contract and Part Time) please indicate your position

Please indicate your age

APPENDIX C: INITIAL EMAIL NOTIFICATION TO RESEARCH SAMPLE MEMBERS

Re: Women in Business survey

Hello!

As an attendee of the Women in Business workshops at LSU you completed a survey regarding your experiences with the program. This information was very valuable and helped us enrich the seminars. As the former director of the WIB program, I want to thank you for your support of this workshop.

Entrepreneurship is ever expanding for women, and one area that has opened up opportunities for Women in Business is the use of e-commerce, social media, and the internet. My colleague, Erastus Ndinguri, is conducting research in this area of female entrepreneurship and would like your feedback. Your comments are very valuable to understanding how women like yourself use social media and e-commerce for business and will be used to expand the knowledge in this field of study.

Please take a few minutes to complete this survey – and thank you so much for your time!

Here's to entrepreneurship!

Carol A. Carter, Ph.D.
Chair, Department of Business and Entrepreneurship
Associate Professor, Department of Business and Entrepreneurship
Director, The Center for Entrepreneurship at Davis & Elkins
Davis & Elkins College
100 Campus Avenue
Elkins, WV 26241

carterc@dewv.edu

APPENDIX D: FIRST e-LETTER TO RESEARCH SAMPLE MEMBERS

Dear Participant,

In recent years, studies geared towards understanding the relationship between women entrepreneurs and technologies have increased. I am conducting a study on women entrepreneurs that will help women in business programs, policy makers, entrepreneur educators and instructors better understand ways in which entrepreneurial women use emerging technology as a trigger factor in coming up with new business ventures and ideas in Louisiana.

You have been selected to participate in this study because of your previous participation in business programs geared towards women. Your individual opinions are valuable to the study.

Please complete the Web-based survey which will take approximately 10-15 minutes. Your participation in this study is voluntary and all responses will remain STRICTLY CONFIDENTIAL.

By completing this survey, you are agreeing to participate in this study. If you have any concerns or questions about your rights as a participant, please contact the Institutional Review Board Chairman, LSU at [\(225\) 578-8692](tel:2255788692) or irb@lsu.edu.

If you prefer responding to a paper-based questionnaire, please email me your physical address at machtme@lsu.edu or ending1@tigers.lsu.edu.

Note: For the first two weeks there will be a drawing for a \$50 Amazon.com gift card to be awarded to two lucky respondents.

To participate in the survey click on the following link:

Feel free to contact us with any enquiries. Thank you for your participation.

Sincerely,

Erastus Ndinguri
Doctoral candidate
School of Human Resource Education
ending1@tigers.lsu.edu
[225-284-0862](tel:2252840862)

Krisanna Machtmes, PhD
Associate Professor
School of Human Resource Education
Louisiana State University
machtme@lsu.edu
[225.578.7844](tel:2255787844)

Carol A. Carter, Ph.D.

Chair, Department of Business and Entrepreneurship
Associate Professor, Department of Business and Entrepreneurship
Director, The Center for Entrepreneurship at Davis & Elkins
Davis & Elkins College
carterc@dewv.edu

opt out link

APPENDIX E: FIRST FRIENDLY REMINDER TO RESPOND

Dear Participant,

Last week a questionnaire was emailed to you asking for assistance in providing feedback. The study is aimed at helping women in business programs, policy makers, entrepreneur educators and instructors better understand ways in which entrepreneurial women use emerging technology as a trigger factor in coming up with new business ventures and ideas in Louisiana. As a prior participant in Women in Business Programs, your unique perspective and opinions are valuable to this study.

Please accept my appreciation if you have already completed the questionnaire.

If you have not completed the survey, kindly do so by **CLICKING ON THE LINK BELOW**.

NOTE: For the first two weeks there will be a drawing for a \$50 [AMAZON.COM](https://www.amazon.com) GIFT CARD to be awarded to two lucky respondents.

The survey will take 10-15 minutes of your time. Your participation in this study is voluntary. Your responses will remain strictly confidential.

If you prefer responding to a paper-based survey, please email me your physical address at machtme@lsu.edu or ending1@tigers.lsu.edu and I will be glad to mail you one.

By completing this survey, you are agreeing to participate in this study. If you have any concerns or questions about your rights as a participant, please contact the Institutional Review Board Chairman, LSU at [\(225\) 578-8692](tel:2255788692) or irb@lsu.edu.

Thank you for your participation.

Sincerely

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Chair, Department of Business and Entrepreneurship
Associate Professor, Department of Business and Entrepreneurship
Director, The Center for Entrepreneurship at Davis & Elkins
Davis & Elkins College
carterc@dewv.edu

APPENDIX F: SECOND e-LETTER FRIENDLY REMINDER TO RESPOND

Dear Participant,

Your participation is still needed in a 10-15 minute women entrepreneur questionnaire. Please accept my sincere gratitude if you have already completed the questionnaire. If you have not, please complete by **CLICKING THE LINK** below.

As a woman, your unique perspective and opinions are valuable to understanding ways in which entrepreneurial women use emerging technology as a trigger factor in coming up with new business ventures and ideas. Your participation is vital to the success of this study.

SURVEY LINK:

Participation in this study is completely voluntary and your responses will remain strictly confidential.

If you prefer responding to a paper-based questionnaire, please email your physical address to ending1@tigers.lsu.edu.

By completing this survey, you are agreeing to participate in this study. If you have any concerns or questions about your rights as a participant, please contact Robert C. Mathews, Institutional Review Board Chairman, LSU at [\(225\) 578-8692](tel:(225)578-8692) or irb@lsu.edu.

Sincerely,

Erastus Ndinguri
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Director, The Center for Entrepreneurship at Davis & Elkins
Davis & Elkins College
carterc@dewv.edu

APPENDIX G: SUBSEQUENT REMINDERS TO RESPOND

Dear Participant,

Your participation is still needed in a 10-15 minute women entrepreneur questionnaire. Please accept my sincere gratitude if you have already completed the questionnaire. If you have not, please complete by **CLICKING THE LINK** below.

As a woman, your unique perspective and opinions are valuable to understanding ways in which entrepreneurial women use emerging technology as a trigger factor in coming up with new business ventures and ideas. Your participation is vital to the success of this study.

Participation in this study is completely voluntary and your responses will remain strictly confidential.

If you prefer responding to a paper-based questionnaire, please email your physical address to ending1@tigers.lsu.edu.

By completing this survey, you are agreeing to participate in this study. If you have any concerns or questions about your rights as a participant, please contact Robert C. Mathews, Institutional Review Board Chairman, LSU at [\(225\) 578-8692](tel:(225)578-8692) or irb@lsu.edu.

Sincerely,

Erastus Ndinguri
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Associate Professor, Department of Business and Entrepreneurship
Director, The Center for Entrepreneurship at Davis & Elkins
Davis & Elkins College
carterc@dewv.edu

APPENDIX H: e-LETTER NOTIFICATION FOR THE GIFT WINNERS

Dear Participant,

Congratulation!

I would like to thank you for responding to the survey of Women Entrepreneurship and Technology sent to you earlier. As part of the survey, a 50-dollar e-gift card from amazon was to be awarded to two lucky recipients. After the draw, you were picked as one of the lucky winners.

To claim the gift card you need to;

- 1. Kindly confirm if this is your primary email by responding to this email**
- 2. We will only send e-gift cards therefore ensure that your email is working**

Thank you again for your participation

Sincerely,

Erastus Ndinguri
Doctoral candidate
School of Human Resource Education
ending1@tigers.lsu.edu
[225-284-0862](tel:225-284-0862)

Krisanna Machtmes, PhD
Associate Professor
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Director, The Center for Entrepreneurship at Davis & Elkins
Davis & Elkins College
carterc@dewv.edu

**APPENDIX I: DATA DESCRIBING TYPE OF BUSINESS VENTURE WOMEN
ENTREPRENURES HAVE STARTED**

| <u>Retail</u> | <u>Consulting</u> | <u>Online</u> | <u>Training</u> |
|---|--|---|--|
| <ul style="list-style-type: none"> A. Real Estate Restaurant B. Retail gift shop C. Custom Dog Couture Clothing and bedding D. underground utility construction E. Photography F. Accessory item G. A flip flop and sandal holder H. antique refurbishing and repurposing of discarded items for sale I. personal shopper J. Pageants K. Protective Garment Cottage Industry L. Cosmetics | <ul style="list-style-type: none"> A. Survey consulting B. V F Phillips Consulting (appraisals, archival services, local history research and publications) C. Lobbying Firm D. Professional Organization Firm E. Providing professional organizing/personal coaching services F. Consulting | <ul style="list-style-type: none"> A. online products B. Web development C. Digital Design D. Freelance Graphic Design E. Online sales | <ul style="list-style-type: none"> A. children training technology skills B. summer day camp C. Non-profit business incubator D. Entrepreneur Training E. disability accessibility and inclusion training |

VITA

Erastus Ndinguri was born in Nairobi, Kenya. He earned his Bachelor of Arts degree in Economics from University of Nairobi, Kenya, in 2007 and his Master of Science in Human Resource and Leadership Development from Louisiana State University in 2010. He also has had professional training in Management of Information systems from the Institute for the Management of information systems United Kingdom (IMIS).

As a teaching assistant at Louisiana State University, Erastus gained valuable experience in teaching and advising both undergraduate and graduate students. He led lectures for in-class and online courses in the following areas: Human Resources, Leadership strategies in organizations, and International Development. Erastus has also been involved in entrepreneurial and general management research, which allowed him to present his work in national conferences. In recognition of his work as a graduate scholar and teacher, he has received distinguished scholarly awards at national conferences, and a Graduate Student Honor merit role award from Gamma Sigma Delta. Additionally he has been involved in research, training and evaluation of Supplier Diversity initiative program at Louisiana State University.

Erastus is a member of the Academy of Management Entrepreneurial division, Academy of Human Resource Development, Society of Human Resource Management, member of Allied Academies Entrepreneurship and Strategic Management divisions, International society for performance improvement, American Educational Research Association and Phi kappa phi Honor Society. His teaching and research interest include Entrepreneurship, Strategic Leadership, Organization Behavior and Human Resource.