

HIGHER EDUCATION AND ENTREPRENEURSHIP: THE RELATION
BETWEEN COLLEGE EDUCATIONAL BACKGROUND AND
ALL BUSINESS SUCCESS IN TEXAS

Mohammad Al-Zubeidi, B.S., M.B.A., M.S.

Dissertation Prepared for the Degree of
DOCTOR OF PHILOSOPHY

UNIVERSITY OF NORTH TEXAS

May 2005

APPROVED:

Ron Newsom, Major Professor and Coordinator of
the Program in Higher Education

Donna Ledgerwood, Minor Professor

Jack Baier, Committee Member

Michael Altekruze, Chair of the Department of
Counseling, Development, and Higher
Education

M. Jean Keller, Dean of the College of Education

Sandra L. Terrell, Dean of the Robert B. Toulouse
School of Graduate Studies

Al-Zubeidi, Mohammad, Higher Education and Entrepreneurship: The Relation between College Educational Background and Small Business Success in Texas. Doctor of Philosophy (Higher Education). May 2005, 138 pp., 33 tables, 1 figure, references, 103 titles.

This study examined the relationship between success of small businesses and the educational backgrounds of their owners. A survey composed of questions concerning demographics, educational backgrounds, and business success was mailed to 1100 businesses in Dallas, Denton, and Tarrant counties in Texas. There were 228 usable responses which were analyzed by using the Statistical Package of Social Sciences (SPSS12).

Data were sorted so that educational level, sales volume, number of employees, and longevity, were identified on a 5-point ordinal scale. Educational major was identified on a 5-point nominal scale. Pearson's correlation was used to determine whether relationships existed between founders' educational background and small business success. Spearman's correlation was used to determine the direction and strength of the relationships.

Then educational level and major were combined with age, gender, ethnicity, and industry, to determine the relationships between founders' educational background, and business success. For this purpose a canonical correlation was used. Five opinion questions concerned influence of college education on business success among college

graduates and non-college graduates were identified on a 5-point Likert scale and tested using one-way ANOVA, and independent sample *t*-test.

When educational level and major were the only predictors of business success, a statistically significant relationship was found between years of formal education, and sales volume. When educational level and major were combined with age, gender, ethnicity, and industry, a statistically significant relationship was found between founders' educational level and age, and business success. A statistically significant and negative relationship was found between founders' educational major and industry, and business success. All opinion questions revealed statistically significant relationships between owner's college education and business success. These relationships indicate the ability for the owner to learn, adapt and maintain a successful business.

The influence of a college education on small business success was noticeable and reflects the continuing need for higher education to cope with technological advances, business competition, and the changing global economy.

ACKNOWLEDGMENTS

I would like to take this opportunity to express my genuine appreciation and gratitude to the chairman and advisors of my dissertation committee: Dr. Ron Newsom, Dr. Donna Ledgerwood, and Dr. Jack Baier for their guidance, advice, understanding, and patience throughout my research. I am also indebted to Dr. John Thompson for his help and constant support.

I also would like to dedicate this humble effort to my mother, Hafezah; father, Ali; sisters, Naifah, Nofah, Sarah, Salwa, and Mariam; and brothers, Khalid and Farris. Without their love, support, and patience I might not have been able to reach this goal. May Allah help me to repay all of them and help others achieve their dreams.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS.....	ii
LIST OF TABLES.....	v
LIST OF FIGURES.....	vii
Chapters	
1. INTRODUCTION	1
Introduction	
Rationale of the Study	
Statement of the Problem	
Purpose of Study	
Research Questions	
Significance of Study	
Definition of Terms	
Assumptions	
Limitations	
Delimitations	
2. REVIEW OF THE LITERATURE	11
Introduction	
Small Business and the Economy	
Higher Education and Small Business	
Entrepreneurship	
Small Business	
Educational Background	
Entrepreneurs Educational Backgrounds	
3. RESEARCH DESIGN AND METHODOLOGY	48
Introduction	
Research Design	
Population and Sample Selection	
Instrument	

Data Collection
Data Analysis

4. FINDINGS.....	63
Introduction	
Demographic Breakdown of Sample	
Results	
5. SUMMARY, DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS	105
Summary	
Discussion	
Conclusions	
Recommendations	
APPENDIX A: COVER LETTER	119
APPENDIX B: PERMISSION LETTERS	121
APPENDIX C: QUESTIONNAIRE.....	124
REFERENCES	130

LIST OF TABLES

Table	Page
1. New Business Incorporations, 1981-1996	14
2. Selected Studies of Job Creation and Destruction (millions)	16
3. Business Creations and Failures 1990-1997	30
4. Education of Self-employed Individuals 1991, 1997-1999 (millions)	31
5. Sample Overview	64
6. Demographic Breakdown of Business Owners	66
7. Characteristic Breakdown of Businesses	67
8. Pearson's Correlation of Business Success by Owner Degree Level	69
9. Pearson's Correlation and Spearman's Correlation of Business Success by Owner Years of Formal Education	70
10. Pearson's Correlation of Business Success by College Major	72
11. One-Way Analysis of Variance of Business Success by College Majors	73
12. Independent Sample T-test of Success by Business and Non-business Majors	74
13. Independent Samples Test of Business Majors and Non-business Majors.....	76
14. Independent Variables Categories	78
15. Dependent Variables Categories.....	79
16. Question Three Correlation Matrix.....	80
17. Question Three Canonical Correlation Model Summary	81
18. Question Three Test of Remaining Canonical Correlation are Zero	82
19. Question Three Standardized Canonical Coefficients	83

20. Canonical Loading Matrix of Question Three Independent and Dependent Variables	84
21. Redundancy Analysis of Question Three Independent and Dependent Variables	85
22. Question Three Summary of Canonical Correlation Analysis	87
23. Educational Major Breakdown	90
24. Question Four Correlation Matrix	91
25. Question Four Canonical Correlation Model Summary	92
26. Question Four Test of Remaining Canonical Correlation are Zero	93
27. Question Four Standardized Canonical Coefficients	94
28. Canonical Loading Matrix of Question Four Independent and Dependent Variables	95
29. Redundancy Analysis of Question Four Independent and Dependent Variables ..	96
30. Question Four Summary of Canonical Correlation Analysis	97
31. Owners' Opinion of College Education Influence on Business Success.....	100
32. Independent Sample T-test Group Statistics.....	102
33. Independent Sample T-test of College Influence by Owners' Opinion.....	104

LIST OF FIGURES

Figure	Page
1. Educational Background and Small Business Success.....	50

CHAPTER 1

INTRODUCTION

The importance of small business to the American economy has been increasingly recognized. Achieving a healthy economy in the 21st century depends heavily on the expansion and improvements in the small business sector (Butler, 1990; Clodfelter, 1990; Ibrahim & Goodwin, 1986; and Kuratko & Lafollette, 1986). Small business plays a vital role in job creation and innovation. Starting in the 1970s and increasing through the 1990s research showed that big companies eliminated millions of jobs, while small businesses generated most of the new jobs (Pitman, 1988; Bygrave, 1997; and Grant, 1998).

Before the 1980s, the economic well being of the United States was conceived by academia as revolving around big business and government support. Large corporations were considered the driving force behind the economy (e.g., Hisrich, 1988), and academic institutions considered preparing students for employment in the corporate world as one of their primary goals (Fiber, 1986; Hisrich, 1988; Kiesner, 1984; and Smith & Steward, 1990).

Starting in the early 1980s and throughout the 1990s, academic interest in small business and entrepreneurship has witnessed significant growth. The heightened awareness of entrepreneurship, individualism, self-actualization and creativity shifted the academic focus away from large corporations toward small businesses and the creation of

new ventures (Hisrich, 1988; Noll, 1993; Smith & Steward, 1990). According to Vesper and Gartner (1997), in the 1990s colleges and universities developed an increasing interest in small businesses and entrepreneurial ventures, which has consequently, lead to the creation of a number of academic courses and curricula in small business and entrepreneurship.

The small business sector witnessed steady growth since the 1970s. As indicated by the literature, prior to the 1970s the well-being of the economy revolved around big businesses. During the 1970s and 1980s, small businesses witnessed significant growth and importance. From the early 1990s to the present, the academic focus shifted from large companies to small businesses. According to Scarborough & Zimmerer (2000), yearly small business creation grew from 375,000 in 1976 to 775,000 businesses in 1996. Such growth in small business formation was accompanied by a significant increase in publications and programs devoted to small business and entrepreneurship (Churchill & Lewis, 1986; Vesper & Gartner, 1997).

As the number of small businesses increased so did the number of small business failures. Several studies such as Ashmore (1988), Holt (1992), Kiesner (1984), National Federation of Independent Business (NFIB) (2003), and Scarborough & Zimmerer (2000) reported that between 40 to 50% of small businesses fail within the first two years of operation. These business failures are attributed to inadequate preparation of students for the business world (Hisrich, 1988), managerial incompetence (Litvak & Maule, 1980; Fiber, 1986), mismanagement and lack of balanced experience (Stull & LaBonty, 1993), and poor decision-making and leadership ability (Scarborough & Zimmerer, 2000). In

part, such high failure rate is considered evidence of the lack of an adequate college educational background.

The literature showed that since the 1970s numerous studies have attempted to examine the factors influencing small business success. These studies included, but are not limited to, characteristics of successful entrepreneurs (McClelland, 1987; Hornaday & Aboud, 1971; Gartner, 1988), the entrepreneurs' perceptions of success (Ibrahim & Goodwin, 1986; Montagno, Kuratko & Scarella, 1986), comparisons of different types of businesses (Bruno & Leidecker, 1988; Williams & Reynolds, 1990; Litvak & Maule, 1980), and comparisons of male and female entrepreneurs (Hisrich, 1988; DeCarlo & Lyons, 1976; Nelson, 1987).

Reviewing of these studies produced two common themes pertaining to the influence of college educational backgrounds on small business success. First, the findings of mixed and sometimes contradicting results related to the factors measured and samples employed. Second, the entrepreneurs' educational backgrounds were marginally considered but were bound to correlate. Despite the literature acknowledgment of the benefits of education in general to small business (e.g., Douglas, 1976; Kiesner, 1984; Robinson & Sexton, 1994), it is difficult to find any convincing evidence supporting the assumption that any particular educational background is a prerequisite for small business success. The majority of more recent research (e.g., Solymossy, 1998) focuses on individual entrepreneurial traits and behaviors, and strongly differentiates entrepreneurs from managers or owners. While such research reveals both similarities and differences

between those who seek to create a business or sustain an existing one, this literature falls short of providing insights into what factors influence the success or failure of a business.

Rationale of the Study

In Gartner's 1988 study, "'Who is An Entrepreneur?' is the Wrong Question," it was found that if we are to understand entrepreneurship in order to encourage growth, we need to focus on the process by which new businesses are created. Gartner also added that in encouraging growth of new businesses, education plays a fundamental role. Therefore, it is necessary to understand the behaviors and educations of entrepreneurs who create new businesses (Gartner, 1988, p. 26).

In their book, *Educating Entrepreneurs for Wealth Creation*, Scott, Rosa, & Klandt (1998) argued that education plays two fundamental roles in the process of economic wealth. First, education increases the supply of highly educated entrepreneurs in the economy especially in industries that require high levels of education. Second, education improves the effectiveness of potential entrepreneurs through enhancing their interpersonal, management and business skills (Scott, et al., 1998, p. 4).

An earlier study by Hornaday & Tieken cited in Brockhaus & Horwitz (1986) discovered that many of the successful entrepreneurs felt that before the current generation of young people, education was less important for entrepreneurs. However, because of the growth of high technology, heavy competition, and the global economy, education is becoming very essential to organizational success (Brockhaus & Horwitz 1986).

In a 1993 study of the effect of education on business ownership, Dolinsky, Caputo, Pasumarty & Quazi used a national longitudinal sample of women to examine the variation of entering, staying, and reentering self-employment by level of educational attainment. The authors found that the likelihood of survival after entering into self-employment is uniformly greater at an increased levels of educational attainment (p. 50). The study also showed that the incidence of initial entry, continuous employment, and reentry status increased with increasing levels of educational achievement (p. 51). The authors argued that less educated women increasingly face financial or human capital constraints that limited their business pursuits.

Furthermore, Sletten & Hulaas (1998) found that in small businesses, the entrepreneurs play the roles of the founders, the owners, the leaders and the managers of their new companies. Therefore, the skills and the educational backgrounds of these persons are vital to the development of new businesses. The authors also added that due to economic changes in society, future entrepreneurs tend to be younger, possess stronger educational backgrounds and have less previous working experience than their predecessors (Sletten & Hulaas, 1998, p. 183).

In summary, to better comprehend entrepreneurship and encourage growth, it is essential to understand the education of new business leaders and creators (Gartner, 1988). Scott et al., (1998) argued that education increases the supply and the effectiveness of potential entrepreneurs. In addition, while Brockhaus & Horwitz (1986) and Sletten & Hulaas (1998) concluded that because current and future entrepreneurs are younger and less experienced, educational backgrounds are vital to the development of

new businesses. Dolinsky et al., (1993) found that the likelihood of survival and growth increased with increasing levels of educational attainment. Therefore, the primary aim of this study was to examine the relationship between college educational backgrounds of small business founders and their entrepreneurial success.

Statement of the Problem

While the literature acknowledges the benefits of education, describes the characteristics of entrepreneurs and relates education to the number of business start-ups, it lacks any solid evidence that supports the relation between any particular college level or major and small business success. The problem of this study, however, was to describe the relation between college educational backgrounds of business founders and small business success.

Purpose of the Study

This study proposed to describe the relation between the educational background of small business founders and small business success. The study attempted to describe whether or not different educational majors and/or educational levels of small business founders are associated with small business success.

It was not the purpose of this study to evaluate the effectiveness of educational programs. Rather, the purpose was to investigate the similarities and differences among different educational backgrounds as they relate to small business success and to explore the association of educational backgrounds with different demographic variables (e.g., gender, age, ethnicity, and industry) and small business success.

Research Questions

This study attempted to answer the following questions:

1. Does college education level have a relationship to success in small business?
2. Does college education major have a relationship to success in small business?
3. Does college education level when associated with age, gender, race, or industry have a relationship to success in small business?
4. Does college education major when associated with age, gender, race, or industry have a relationship to success in small business?

Significance of the Study

The small business sector is increasingly growing in size and importance to the health of the economy. According to Faris (2003), small businesses at the present are responsible for 80 % of new jobs and 50% of the Gross National Product (GNP). At the same time, about half of all new businesses in the United States fail within the first two years (Ashmore, 1986; Kiesner, 1984; and Scarborough & Zimmerer, 2000).

A review of the literature showed that education in general has a positive effect on business success (Douglas, 1976; Robinson & Sexton, 1994; and Vesper, 1990). Despite such effect, no research provided any solid evidence concerning the role of college education in small business success. Therefore, the researcher designed this study to describe the relation between the educational backgrounds of business founders and small business success and to identify variables and determinants of small business success as they relate to different educational backgrounds.

Findings from this study provide a clearer description of the impact of college education on small business success that may contribute to the existing literature and future research. These findings could have implications for college educators to promote successful entrepreneurs.

Definitions of Terms

For the purpose of the study, the following terms are defined:

Business success: A literature review revealed no universal agreement concerning one single definition of business success. For the purpose of this study, a business was successful if it remained in business for five or more years and achieved positive sales growth (Ibrahim & Goodwin, 1986, p. 42).

Educational background: In this study, educational background represented the college education major and/or the college educational level a person obtained upon attending or graduation from college.

College educational level: In this study educational level represented the years of formal education a person obtained at the time the data were gathered (Robinson & Sexton, 1994, p. 146).

College education major: In this study, education major represented the area of concentration a person obtained while attending or at graduation from college.

Entrepreneur: As shown in the literature review, research to date has not provided a universally accepted definition of “entrepreneur.” However, for the purpose of this study, an entrepreneur is a person who perceives an opportunity and creates an independent new business to pursue it (Bygrave, 1997, p. 5).

Entrepreneurship: This term is defined as the process that involves starting a business venture to pursue a perceived opportunity (Bygrave, 1997, p. 6).

Small business: The literature provides many different definitions of small business. For this study, a small business was defined as (1) an independently owned and operated enterprise, (2) did not dominate its market, (3) are which was operated in a local geographical area; and (4) are whose workforce did not exceed 20 people (Cuba, Decenzo & Anish, 1983; Ibrahim & Goodwin, 1986).

The literature included various studies that attempted to differentiate between entrepreneurs, owners-managers, or small businesspersons (e.g., Drucker, 1985; Begley & Boyed, 1987; Maranville, 1992). Despite such effort, one thing remained constant: their entrepreneurial ability to create a small business. Therefore, for the purposes of this study the terms entrepreneur and small business person and the terms entrepreneurship and small business are synonymous and used interchangeably.

Assumptions

The following assumptions guided the execution and interpretation of this study:

1. Small business is vital to the well being of the national economy.
2. College education is valuable to small business success.
3. The founder's college educational level is related to small business success.
4. The founder's college educational major is related to small business success.
5. The study of successful businesses reveals information about the relationship between educational background and business success, and does not seem to describe the educational background of unsuccessful business persons.

6. The respondent starts the business that he/she currently owns and manages.

Limitations

The study was subjected to the following limitations:

1. Business founders who are willing to participate by returning the completed questionnaire.
2. Due to the structured nature of the survey, the data may not reflect the opinions and feelings of the respondents.
3. After distributing the questionnaire, it is not possible to modify the items, even though they may be unclear to some respondents.

Delimitations

This study was subjected to the following delimitations:

1. The sample of small businesses was randomly selected from Dun and Bradstreet (D&B) small business database for the Dallas, Denton, and Tarrant Counties in Texas.
2. A small business was considered successful if it showed positive sales volume, positive number of employees, and stayed operational for five or more years.
3. Education background was limited to the educational level or majors attained by the respondents as they attended or graduated from college.

CHAPTER 2

REVIEW OF THE LITERATURE

Introduction

This chapter includes a review of literature related to the relation between college educational background of small business founders and business success. The purpose of this literature review is to establish the theoretical base from which to derive an instrument (survey) to measure the relationship between college educational background and small business success. A review of the literature within the small business and entrepreneurial fields revealed an extensive amount of literature representing various disciplines. These disciplines include, but are not limited to, economics, psychology, sociology, management, organizational behavior, and marketing. There are three primary divisions to this literature review: the entrepreneur, small business, and college educational background.

The literature shows that numerous publications and programs have been devoted to small business and entrepreneurship. A review of the literature conducted by Churchill and Lewis in 1986 revealed 6,322 articles between the years of 1971 and 1984, of which 3,694 were published after 1981, indicating that research within the field small business and entrepreneurship rapidly increased since 1980.

A more recent review of book titles pertaining to entrepreneurship and small business was conducted by Katz (2003) produced 625 titles in 1995 and 4687 titles in 1998. Such increase in the literature reflects the important role small business and entrepreneurship play in the economy's well being.

Small Business and the Economy

As the United States society has shifted from an industrial to an information and service economy, entrepreneurship and small business firms have led the way in job creation, innovation, and productivity. The small business' role, though overlooked, according to Solomon (1986), *Small Business USA*, has always been important. Solomon (1986) says that:

Small business was the dominant agent of the long period of U.S. economic development; it has driven the historic rise of the service sector, and has never ceased generating business innovations. Throughout U. S. history, it has motivated Americans as an economic ideal and has been the vehicle by which millions have reached the American dream. Above all, it is an enormously powerful economic force. (pp. 1-2)

This growing interest in entrepreneurship especially on the part of government is prompted in part by the assumption that much of the economy's ability to innovate, diversify, and create new jobs comes from the small business sector (Acs, 1999; Scott & Twomey, 1988; Solomon, 1986). The importance of small business to the health of the economy according to Hodgetts & Kuratko (1998), *Effective Small Business*

Management, was reflected in the Small Business Administration (SBA) following report. The SBA stated:

1. There are over 20 million non-farm businesses in the U.S. and small business accounts for over 98% of these firms.

2. Small business accounts for 50% of the GNP and 48% of the Gross Business Product.

3. Small business provides 58% of total U.S. business employment, excluding farms.

4. That 90% of all corporations are small business firms and 90% of all business firms employ less than 20 employees (Hodgetts & Kuratko, 1998, p. 8).

Since the mid 1970s, the number of new small businesses created every year has been steadily increasing. According to Scarborough & Zimmerer (2000), annually established businesses between the years of 1976 and 1996 have increased from 375,000 to 775,000 a year. As shown in Table 1, the number of small businesses created yearly has been steadily increasing.

College students also showed an increased interest in starting a business. A national survey by the Roper Organization revealed that 46% of college students consider a “business of one’s own” an excellent way to get ahead (Karr, 1988). The University of Pittsburgh survey of career goals of 1,000 Master of Business Administration (MBA) students from top business schools showed that 44% plan to become independent entrepreneurs (Brenner, Pringle & Greenhaus, 1991).

Table 1

New Business Incorporations, 1981-1996

Year	Established	% Change	Year	Established	% Change
1996	775,000*	3.0	1988	685,095	-0.1
1995	750,000*	1.0	1987	685,572	-2.4
1994	741,657	5.0	1986	702,101	5.0
1993	706,537	6.0	1985	666,800	6.1
1992	666,800	6.1	1984	634,991	5.8
1991	628,580	-2.9	1983	600,400	5.9
1990	647,366	-4.3	1982	566,942	-2.5
1989	676,567	-1.2	1981	581,661	--

* Estimated.

Source. U.S. SBA, Office of Advocacy. *A Report to the President, 1999-2000*.

In a recent survey of college seniors, 49% of the men, and 31% of the women said they were interested in pursuing entrepreneurship when they graduate (Scarborough & Zimmerer, 2000). Such desire for starting and owning a business is reflected in the growing number of courses and programs in small business and entrepreneurship at the college level.

Higher Education and Small Business

Traditionally, academic institutions prepared students to be managers by learning how to mind the store and to avoid challenging the beliefs and assumptions of the organization (Hisrich, 1988). Emphasis was on organizational structure, lines of responsibility and authority, and key management principles (e.g., planning, staffing,

organizing, directing and control). Little, if any, emphasis was placed on innovation, creativity and starting your own business (Hisrich, 1988).

The few college courses offered were generally presented as small business courses whether in management, marketing, or finance. Most of such courses merely attempted to downsize key concepts developed for large organizations to smaller ones (Hisrich, 1988; Solomon, 1986). There was little discussion and even less career counseling about starting your own business. Instead, students were prepared to successfully interview, survive, and succeed in a corporation (Hisrich, 1988).

Starting in the early 1980s, the thinking in higher education started to change. Such change according to Hisrich (1988) was influenced by two major factors, First, small business ability to create new jobs. Second, large companies would employ limited number of employees and besides yearly trimming of employees, no further development of new jobs.

As reported in numerous studies, the majority of the new jobs created are in the small business sector. As presented in Table 2, most of the new jobs are created by small businesses, and the largest loss of jobs is in large companies.

In their research, Kuratko & Hodgetts (2000) reported that of the 24.8 million businesses in existence (5.5 million of which are employer businesses), 97% are considered small. Moreover, Acs (1999), *Are Small Business Important*, cited the SBA reporting that small businesses were a major factor in creating the 14 million jobs during the Clinton Administration.

Table 2

Selected Studies of Job Creation and Destruction (millions)

Author	Years	Small Business	Large Companies
T. Pitman, 1988	1974-1984	+ 12	- 1.5
A. Grant, 1992	Mid 1980s	+ 17	- 3.1
W. Bygrave, 1997	1990-1994	+ 7-8	- 3.6

Consequently, the attitude of higher education started to change from considering preparation of students for large corporations to preparing students for small businesses (Clow, 1997; Hisrich, 1988; and Smith & Steward, 1990). The 1997 and 2001 studies by Vesper and Gartner on college courses pertaining to entrepreneurship showed a significant increase in numbers. In 1975, courses in entrepreneurship were available at 104 colleges or universities throughout the U.S. The number increased to 163 by 1980, 253 in 1985, 317 in 1990, 400 in 1995, and 504 in 2001 (Vesper & Gartner, 1997; 2001).

Moreover, Scarborough & Zimmerer (2000) reported that in the U.S. today, more than 1500 colleges and universities offer courses in entrepreneurship and small business. As a result, a new spirit of do your own thing, do not take a corporate position or career, and self-fulfillment began to emerge.

Entrepreneurship

The concept of entrepreneurship according to David Holt (1992) has been around for a long time and the American system of free enterprise has always engendered the

spirit of entrepreneurship. Small business and entrepreneurship play an important role in today's economy and the future rests squarely on entrepreneurial ventures (p. 2).

Therefore, more and more people are interested in small business and entrepreneurship.

In his article, "Entrepreneurship Education," Clow (1997) stated that an entrepreneurial explosion occurred in the U.S. starting in the 1970s and continued through the 1990s. Such increase in entrepreneurial activities according to Clow (1997) was caused by several reasons such as the increase role of women in the workforce, influence of technology, lower cost of market entry, and turbulence in the American economy. Therefore, the decade of the nineties is spoken of as the decade of the entrepreneur (Noll, 1993). Such statements raise questions such as "who is an entrepreneur?" and "what is entrepreneurship?"

Definition of the Entrepreneur

A review of the literature reveals that the word entrepreneur can be traced back to the twelfth century, being rooted in the French verb "entreprendre" meaning "to do something different" or to "undertake" (Holt, 1992; Long, 1983). Economists have been defining entrepreneurship in terms of behavior since 1755 when Richard Cantillon published his "Essai sur la Nature Commerce en General" (Hebert & Link, 1988). For Cantillon, the essence of entrepreneurship was the risk-taking behavior.

Throughout history, various scholars in the field of economics perceive the concept "entrepreneur" differently. The Frenchman Jean Say viewed the entrepreneur as one who brought together the factors of production to create wealth, and Carl Menger viewed the entrepreneur as a person who transforms resources into useful goods and

services. While Joseph Schumpeter viewed the entrepreneur as an innovator of new combinations of resources and commerce, Frank Knight saw the entrepreneur as the manager of uncertainty. Israel Kirzner also saw the entrepreneur as one who perceives what others have not seen and acts upon that perception (Kent, 1984; Long, 1983; and Robins, 1986).

Although tying the concept of entrepreneur to an individual, Cantillon and the early mentioned economics scholars according to Herbert & Link (1988) and Holt (1992) viewed the entrepreneur as a change agent and were more interested in the economic function than in the personal characteristics and behaviors of the entrepreneur.

With the definition in mind, it can be difficult to identify entrepreneurs despite the extensive research performed by so many scholars. Arthur Cole's (1969) study, *Definition of Entrepreneurship*, stated that a common definition of the entrepreneur would remain elusive. Cole noted:

My own personal experience was that for ten years we ran a research center in entrepreneurial history, for ten years we tried to define the entrepreneur. We never succeeded. Each of us had some notion of it; what he thought was, for his purposes, a useful definition. And I don't think you are going to get any farther than that. (Cole, 1969, p. 17)

Recent reviews of the literature have found few changes since Cole's statement. David Holt (1992), *"Entrepreneurship: New venture creation,"* added that the difficulty in defining entrepreneurship is due to the absence of formal classifying guidelines, entrepreneurial licensing procedure or professional status of entrepreneurs (p.8).

The absence of consensus in defining entrepreneurship is a result of differing disciplinary research. Emeric Solymossy's (1998) and Carl Vesper's (1990) reviews of the literature showed that entrepreneurship definition varies among various disciplines. For example, economists consider the entrepreneur as a rational agent contributing to an economic activity; therefore, the focus is on the market rather than the human factors. Sociologists focus on social conditions that view the entrepreneurial activity as a product of structural conditions and social factors. Management emphasizes organizational factors as facilitating the success/survival or failure of ventures, and stressing financial and marketing strategies. The psychological approach looks upon venture creation as the manifestation of personality characteristics of the individual (Solymossy, 1998, pp. 5-6).

Several authors according to Solymossy (1998) have expressed their concern regarding the ambiguity and conceptual inconsistency of the term "entrepreneur" itself. Definitions frequently differed among researchers, yielding a variety of research designs. Consequently, findings have frequently been either contradictory or failed to significantly differentiate between entrepreneurs and the general population (Solymossy, 1998). In their book, *Educating entrepreneurs for wealth creation*, Scott, Rosa, & Klandt (1998) concurred that entrepreneurship lacks a universally accepted definition. They concluded that entrepreneurship is a behavioral process and there is no one single psychological profile of the entrepreneur.

As a result, a concise definition of the entrepreneur or entrepreneurship does not exist in the literature. However, the literature provides a wide range of definitions of entrepreneurship. For instance, Fiber (1986) characterizes entrepreneurs as doers, realistic

and decision-makers. Webster's definition of an entrepreneur agrees with the economists who say every businessperson is an entrepreneur who organizes, manages, and assumes the risks of a business or an enterprise. Karl Vesper (1990) defines an entrepreneur simply as a person who takes the initiative to profit on business opportunities. Vesper's broad definition of entrepreneurs included self-employed builders, team workers, inventors, pattern multipliers, economy of scale exploiters, acquirers, buy-sell artists, and speculators.

While Bygrave (1997) defines an entrepreneur as a person who perceives an opportunity and creates a business to pursue it, Grant (1998) distinguishes between 'proprietors' who start up businesses to pursue lifestyle goals from 'real entrepreneurs' who have the vision and drive to create new products and services.

Despite the absence of one concise definition of an entrepreneur, one thing remains constant, which is the ability of entrepreneurs to create new businesses. As a result, Bygrave's (1997) definition of the entrepreneur as a person who perceives an opportunity and creates an independent new business to pursue it was used in this study.

Characteristics of the Entrepreneur

The literature revealed that much of the early entrepreneurship research focused on the activities of entrepreneurial individuals. A shift in focus in theoretical discussions from the behavioral activities of individuals to their personal characteristics started according to Solymossy (1998) as early as the 18th century. Such change shifted the focus from "what entrepreneurs do" to "who entrepreneurs are."

In his study, “*Who is an Entrepreneur?*’ is the wrong question,” Gartner (1988) attempted to identify the major entrepreneurship research that identified traits and characteristics of the entrepreneur. Gartner classified the characteristics and traits of the entrepreneur as either sociological or psychological in nature.

Gartner’s list of sociological traits:

1. McClelland (1961) high need for achievement,
2. Davis (1963) demographic traits such as educational level and number of children,
3. Schrage (1965) and Wainer & Rubin (1969) high need for affiliation and power,
4. Collins & Moore (1970) and Gomolka (1977) with sex, age, ethnicity, and social background, and
5. DeCarlo & Lyons (1979) with demographic traits of age, marriage rate, and educational level (Gartner, 1988, pp.13-20).

The psychological list includes: (a) Litzinger (1965), Brockhaus (1980), and Hull, Basely, & Udall (1980) trait of risk propensity, (b) Hornaday & Bunker (1970) with tolerance of ambiguity, (c) DeCarlo & Lyons (1979) with autonomy, aggression, support, and conformity, and (d) Hull, Basely, & Udall (1980) with locus of control, and risk propensity (Gartner, 1988, pp.13-20).

Based on his study of the empirical research conducted by Brockhaus & Nord in 1979 and Sexton & Kent in 1981, Gartner (1988) pointed out that the entrepreneur’s sociological and psychological traits are not significantly different from those of

managers and the general population. Such findings added to reducing the idea that entrepreneurs have a unique personality that allows them to identify profitable opportunities.

In summary, reviews of entrepreneurship research consistently conclude that while personality characteristics and traits have been measured and categorized in many different fashions, none of the individual traits has uniquely distinguished the entrepreneur. However, there is an agreement that entrepreneurs have personality traits such as initiative, creativity, risk taking, enthusiasm, independence, vision, and control of resources (e.g., Montagno, Kuratko, & Scarcella, 1986; Noll, 1993, and Scarborough & Zimmerer, 2000). Therefore, due to lack of unique characteristics or traits of entrepreneurs, one can assume that educational background plays an important role in helping individuals identify and sustain profitable opportunities.

Entrepreneurship and Small Business

Historically, entrepreneurship and small business were linked together, but small business and entrepreneurship are not synonymous. Small business by definition includes entrepreneurs according to Holt (1992), because most new ventures start small. Peter Drucker (1985) defines entrepreneurship as a behavior that sees change as a norm and the owner of a new business that does not offer something new or different is only a business owner not an entrepreneur. Drucker also viewed entrepreneurship as a redirection of resources to progressive opportunities, not to ensure administrative efficiency. Such redirection of resources distinguishes the entrepreneurial role from the traditional management role (Drucker, 1985, pp. 21-22).

A small business is distinguished from entrepreneurship by the nature of the enterprise or the intention of its owner. A small business person is likely to start a venture to serve a local market with no intentions to grow, while an entrepreneur is one who is oriented towards changing and expanding his/her business (Holt, 1992; Kiesner, 1984). Such an argument suggests that a small business person thinks of his/her business as a way to make a living, while the entrepreneur thinks of his/her business as a venture into the future.

At the same time, business managers are also distinguished from entrepreneurs. David McClelland's studies of achievement drive in 1961 and 1965 cited by Robbins (1986) differentiated between managers and entrepreneurs. McClelland suggested that for a manager to qualify as an entrepreneur, he/she needs to be a risk taker, energetic, visionary, knowledge of consequences, and organizationally skilled (Robbins, 1986, p. 22).

The literature provided several studies that distinguished the manager from the entrepreneur (e.g., Solomon 1982; Sexton & Bowman, 1986; Robbins, 1986, Maranville, 1992; Zeithaml & Rice, 1987). In these studies, the entrepreneur is the one, who creates, inspires and changes, and the manager as the one who organizes and maintains order. The Hayberg Consulting Group conducted a more recent study cited by Scarborough & Zimmerer (2000). The group found that entrepreneurs differ from managers by being aggressive, independent, quick, practical, risk takers, have high expectations, positive, and upbeat.

In general, the two concepts are closely related, and it is difficult to separate one from the other where small business includes entrepreneurship because most of new businesses start small (e.g., Holt, 1992). In addition, at the start of the business, the entrepreneur plays the role of the founder, the owner and the manager of the small business (e.g., Sletten & Hulaas, 1998). For the purpose of this study, the term's small business and entrepreneurship are synonymous and used interchangeably.

Small Business

As previously discussed, the small business sector plays a crucial role in today's economy. The literature demonstrated that small businesses are major contributors in areas such as job creation, new products, and new markets (e.g., Acs, 1999; Hodgetts & Kuratko, 1998; Kiesner, 1984; Scott & Towmey, 1988). As a result, small business according to Hodgetts & Kuratko (1998) accounts for 98% of non-farm businesses, 50% of GNP, and 58% of total employment. Clearly, small business is an important segment of the U.S. economy and both needs and deserves more attention from the academic world. Such importance raises the question "what is small business?"

The Concept of Small Business

Individuals who are asked to define small business seem to identify the term with a mom and pop store (a business owned and operated or primarily operated by a family). Kiesner (1984) pointed out that it is difficult to define a small business when a business workforce moves beyond 10, 20, or 30 employees. The literature lacks a clear-cut definition of small business. According to the U.S. Small Business Act of 1953, which created the Small Business Administration (SBA), a small business is independently

owned and operated and is not dominant in its field of operation (Hodgetts & Kuratko, 1998; Kiesner, 1984). As reported by Holt (1992), the SBA defined a small business as one that does not dominate its industry, has less than \$10 million in annual sales, and has fewer than 1,000 employees. The SBA's definition of small business is so vague according to Holt (1992) and Kiesner (1984) that allowed the SBA to use the above-mentioned benchmarks for evaluating loans and providing financial assistance to large corporations.

Peter Drucker (1985), *Innovation and entrepreneurship*, defined a small business as a business that requires at most one person who does nothing but top management work and who is not engaged in any of the functional work required. Drucker's definition indicates that a firm is small when the top person knows and monitors the few key people in the firm who are critical to its success or failure (pp. 21-25). Such a definition would allow firms with hundreds of employees, millions of dollars in volume, and few key people to be included as a small business.

Researchers at the International Conference on Small Business in Spain in 1982 agreed to define small business as an independently owned business whose workforce does not exceed 50 people (Kiesner 1984). Consequently, the following guidelines for a common definition of small business were adopted: (a) small business is independent of any important economic or financial group, (b) not dominating the market, (c) personal coincidence between ownership and administration of the firm, and (d) limited to 50 or fewer employees (Kiesner, 1984, p. 8).

The literature includes various attempts to define small business. Researchers and policy makers, looking for an objective definition of small business, have used a variety of criteria, including total worth; relative size within industry; number of employees; value of product; annual sales or receipts; and net worth (Cochren, 1981). However, such benchmarks vary considerably according to the nature of the business or industry. For instance, a fast food franchise such as McDonald's can generate millions in sales with only few employees. On the other hand, firms with several thousand workers may have low sales volume (Holt, 1992, p.13).

The National Federation of Independent Businesses (NFIB) also expressed the concern of distinguishing between farmers, entrepreneurs, small business owners, and family businesses (Faris, 2003). They argued that despite the many definitions of each term, they are closely related and the overlap has limited consequences outside the academic community. The NFIB concluded that small business is defined in many ways for public policy purposes and is created to apply to specific situations. However, they are likely to use an employee based measuring criterion and assume private ownership (Faris, 2003, p. 10).

Watson and Everett's (1996) study of small business failures reported that the British Committee of Inquiry on Small Firms investigated various ways of defining a small firm. The committee realized that a small business could not be satisfactorily defined in terms of employment, turnover, output, or any other arbitrary single quantity. Instead, the committee used an economic definition that used three primary characteristics of a small firm: market share; personalized management by owner(s); and independence from

the influence of any large enterprise in decision-making (Watson & Evertt, 1996, p. 46). Furthermore, small businesses according to Holt (1992) seldom dominate their industries and rely on filling a niche in a local or a regional market.

As a result, there is no one generally accepted definition of a small business. For the purpose of this study, a small business is defined as:

1. independent,
2. not dominating the market,
3. twenty or fewer employees,
4. operates in a local geographical area and
5. owned by no more than two partners.

(Cuba, Decenzo & Anish, 1983; Ibrahim & Goodwin, 1986).

Small Business Success

Measuring business success is somewhat problematic due to the absence of consensus to what constitutes business success. Prior research shows that two distinct approaches have been used to measure business success: objective economic measures (e.g., Sexton, 1997), and subjective perceptions of the entrepreneur regarding their success (e.g., Ibrahim & Goodwin, 1986).

In their study, "Measuring performance in entrepreneurship research," Murphy, Trailer & Hill's (1996) review of the literature showed eight various success dimensions on the basis of economic performance: efficiency, growth, profit, size, success/failure, liquidity, market share, and leverage. The authors found little consistency in performance measurement across studies and majority of the research used one or two dimensions of

performance without justifying the selection (Murphy, et al., 1996, p. 18). The study suggested being specific about the performance measure being used, justify the use of such measure, include multiple dimensions of performance, and consider other critical control factors such as size or industry (Murphy, et al., 1996, pp.22-23).

In his 1998 study of entrepreneurial dimensions, Eric Solymossy also reviewed the literature on the use of economic performance indicators to define small business success. Solymossy suggested that efficiency is ambiguous, therefore difficult to operationalize in a manner that would transcend industries and business size. He added that growth; size, liquidity, leverage, and market share may assume a strategic intent and orientation of the entrepreneur but may not be appropriate for a generalizable conceptualization that is capable of accommodating different industries and economic environments (Solymossy, 1998, p. 46).

In general, success has been operationalized by income, employment, revenue, or survival (Duchesneau & Gartner, 1990; Kilpatrick & Crowley, 1999). Survival of the business presents a simplified view of success where a business succeeds by not failing. According to Duchesneau and Gartner (1990), survival denotes existence and fails to provide meaningful insight into the factors affecting, or the relationships resulting in increased success. Using profit is also problematic, since in their early stages of growth firms frequently reinvest profits to enable continued growth and as a result, reflect relatively low profitability (Duchesneau & Gartner, 1990; Solymossy, 1998).

Employment and revenue were also used in the literature as measures of economic success. Levels of success according to Begley (1995) and Sexton (1997) can

be determined if whether the business had steady, declining or increasing levels of revenue or employment. Using growth rate according to Solymossy (1998) is becoming an increasingly pursued area of inquiry (e.g., Sexton, 1997; Begely, 1995) because it taps the dynamic nature of business growth and differentiates between businesses based on growth rate.

Despite the difference among scholars on what to use as a measure of business success, in this study, success is defined in terms of sales growth, employment growth, and longevity (years in business). In other words, a successful small business has a positive sales and employment growth as compared to competitors of the same size and type of business (Solymossy, 1998; Sexton, 1997) and has been in business for five or more years (Ibrahim & Goodwin 1986; Cuba, et al., 1983). Recent studies by Kilpatrick & Crowley (1999) and the SBA (2000) report support the notion of using sales growth, employment growth and longevity as key indicators of small business success.

Small Business Failure

It is evident that small business and entrepreneurship had a significant impact on the economy's success in the U.S. However, with the increase of entrepreneurial success, the number of small businesses failing has also increased. In his study of small business practitioners, Kiesner (1984) reported that between one-third and 50% of those new businesses would fail in the first two years, and at least two-third to 90% will fail within the first five years.

Ashmore (1988) cited the SBA report, which indicated that roughly one-half of all new businesses in the U.S. fail within the first two years. A more recent report by Dun

and Bradstreet (D&B) was cited in Scarborough & Zimmerer (2000), *Effective Small Business Management*, indicated that 40% of new businesses fail within five years and 67% fail within 10 years.

As presented in following Table 3, the SBA report showed the number of yearly-established businesses and the percentage of businesses that failed or closed. The table shows that the number of businesses that failed or closed has increased steadily since 1992.

Table 3

Business Creations and Failures 1990-1997

Year	No. Business Failures	% of New Businesses
1989-1990	502,685	90.0
1990-1991	516,964	100.0
1991-1992	492,746	95.0
1992-1993	466,550	86.5
1993-1994	476,667	87.0
1994-1995	472,441	83.0
1995-1996	485,509	85.0
1996-1997	500,014	87.0

Note. Business size is < 20.

Source. U.S. SBA, Office of Advocacy, *A Report to the President. 1999-2000*.

Small business literature includes studies conducted to investigate the reasons behind business failures. Ashmore's (1986), "Entrepreneurship: Future direction," reported that the NFIB surveyed 5000 entrepreneurs and found that 40% had only a high school diploma or less and of that 38% had never taken a business course (p. 151).

A more recent report by the SBA (2001) showed similar percentages of the educational level among small business founders. As shown in Table 4, individuals with educational level of high school or less established nearly half of the new businesses. The table also shows that over 65% of the self-employed did not graduate from college. Such reports strongly suggest that the lack of a sound educational background, namely college education, may be a critical factor attributing to the high failure rate of small business.

Table 4

Education of Self-employed Individuals 1991, 1997-1999 (millions)

Education Level	1991		1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%
High school or less	5,519	45	4,976	41	4,755	39	4,638	40
Some college	3,064	25	3,397	28	3,305	27	3,184	27
Bachelor degree	2,154	17	2,428	20	2,542	21	2,301	20
Graduate degree	1,642	13	1,501	12	1,508	13	1,509	13

Source. U.S. SBA, Office of Advocacy, *A Report to the President, 1999-2000*.

In their study, *Causes of New Venture Failure*, Bruno & Leidecker (1988) traced the performance of 250 firms founded in California's Silicon Valley in the 1960s and the 1980s. They found that in both periods, 30% of business failures were a result of mismanagement. They also asserted that the reason behind business failure was the founders' inability to recognize their own strengths and weaknesses and act accordingly,

which have not changed much in 20 years (p. 51). Other studies like Noll (1993) and Stull & Labonty (1993) also found that small business fails primarily because of incompetence, mismanagement and lack of experienced employees.

Dun and Bradstreet Corporation publishes annual reports concerning small business issues. They offered a list of causes that force small business to fail according to business owners (Hodgetts & Kuratko, 1998). The list includes, but is not limited to, poor sales, competition, heavy operating expenses, and poor location. The NFIB also publishes reports on business starts and stops in an effort to quantify business formations and terminations. The NFIB findings reported by Ashmore (1986) and Faris (2003) were also consistent with Dun and Bradstreet reports regarding the major causes behind small business failure. It seems that most business people attributed many of their problems to external forces.

In his study of the training and educational needs, uses, and desires of small business practitioners, Kiesner (1984) suggested that many of these external difficulties are excuses for the true problem, which is caused by the business person's inability to run his/her business properly. The inability to run a business can be attributed to the lack of necessary education. Samuel Aluko's study of business failures, cited by Kiesner (1984), found that most businesses fail due to the lack of business education.

Aluko stated, "About 80% of all small business failures are attributable to inadequate planning, poor accounting, inadequate control mechanism, inability to read and understand financial statements, and the inability to

accept technical and economic advice. That is the absence of sound business education and training.” (Kiesner, 1984, p. 17)

Obviously, a business degree is not essential to successfully start and operate a business. College education, however, may help business owners and managers to understand and use such concepts as business plan, marketing strategy, locating and financing a business, dealing with legal issues, and managing human resources (Ashmore, 1986; Noll, 1993). Therefore, it could be concluded that while experience plays an important role in the success of the entrepreneur, education and training are the important other half of the equation.

Educational Background

Aside from business administration, the extent to which college majors constituted a real preparation for business ownership is not clear. Traditionally, higher education plays a role in determining a person’s career ladder to the corporate sector and to a profession. According to Rosa & McAlaine (1991), those most likely to become self-employed upon leaving the university are those trained in professions where self-employment is the normal organizational form. For example, students entering legal, medical or those from a family whose business ownership acts as a magnet to career aspirations.

In the case of family business, Boyed’s (1998) study of mentoring in family firms, found that family members acquire the necessary education from being involved in the family business and develop a greater interest in the success of the business. In such cases, the type of degree or the family background has a major influence in orienting

students toward a professional career in self-employment. The majority of other students are heavily oriented toward careers as corporate employees (Rosa & McAlaine, 1991; and Hisrich, 1988).

As discussed earlier, in his 1988 article, “*Who is An Entrepreneur?’ is the wrong question,*” Gartner stated that if we to understand entrepreneurship in order to encourage growth, we need to focus on the process by which new businesses are created. He also added that to encourage growth of new businesses, education plays a fundamental role, therefore, it is necessary to understand the behaviors and educations of these entrepreneurs who create new businesses (p. 26).

In their book, *Educating entrepreneurs for wealth creation*, Scott, Rosa, & Klandt (1998) argued that education plays two fundamental roles in the process of economic wealth. First, education increases the supply of highly educated entrepreneurs in the economy especially in industries that require high level of education. Second, education improves the effectiveness of potential entrepreneurs through enhancing their management and business skills (Scott, et al., 1998, p. 4).

An earlier study by Hornaday & Tieken cited in Brockhaus & Horwtiz (1986) discovered that many of the successful entrepreneurs felt that before the current generation of young people, education was less important for entrepreneurs. However, because of the growth of high technology and heavy competition, education according to Brockhaus & Horwtiz (1986) is becoming very essential.

In a study of the effect of education on business ownership, Dolinsky, Caputo, Pasumarty & Quazi (1993) used a national longitudinal sample of women to examine the

variation of entering, staying, and reentering self-employment by level of educational attainment. The authors found that the likelihood of survival after entering into self-employment is uniformly greater with increased levels of educational attainment (p. 50). The study showed that the incidence of initial entry, continuous employment, and reentry status increased with increasing levels of educational achievement (p. 51). The authors also argued that less educated business owners might face financial or human capital constraints that limited their business pursuits (Dolinsky et al., 1993).

Furthermore, Sletten & Hulaas (1998) found that in small business, the entrepreneur plays the roles of the founder, the owner and the manager of the new company. Therefore, the skills and the educational backgrounds of these persons are vital to the development of new businesses. The authors also added that due to economic changes in society, future entrepreneurs tend to be younger, with stronger educational background and with less working experience (Sletten & Hulaas, 1998, p. 183).

The literature shows that numerous studies support the notion that entrepreneurs are better educated than the general population (e.g., Cooper & Dunkelberg, 1987; Robinson & Sexton, 1994; Kilpatrick & Crowley, 1999; and Scott, et al., 1998). These studies represent evidence of the increasing importance of education to small business development and survival. In today's society, new businesses are no longer the option for the social and educational non-achievers but are a viable career option for the more educated segment of society.

Influence of Education on Small Business

The impact of education on business success of an entrepreneur has been the subject of much discussion and speculation in both the popular and academic press. One of the major concerns of those interested in the creation, continued success, and growth of new businesses is the issue of whether entrepreneurs are born or whether they can be created through education and training.

In his book, *New Venture Creation*, Timmons (1994) suggested that entrepreneurs accumulate relevant knowledge and skills over the years and their pursuit of an opportunity is a result of experience, planning, and education. Other scholars such as Garnier & Gasse (1990), Sexton & Bowman (1986), and Webber (1981) supported Timmons's suggestion and asserted that students start their businesses because of exposure to entrepreneurial education.

Such argument makes the education issue an important one. Reflecting on this concern for education, Brockhaus & Horwitz (1986) expressed the belief that the most likely entrepreneurs to fail would be those with experience but no education, and the second most likely entrepreneurs to fail would be those with education but no experience.

In general, the literature has demonstrated that although some famous entrepreneurs have emerged from the ranks of the uneducated, entrepreneurs with a good general education tend to be more successful compared to those with less-than-favorable education histories. Furthermore, entrepreneurs were more successful when education is combined with experience (Brockhaus & Horwitz, 1986; Robinson & Sexton, 1994; Scott et al., 1998; and Vesper, 1990).

It can be surmised that while experience is perceived as the critical factor in the determination of the business direction, entrepreneurs appear to benefit greatly from a sound educational background.

Relation of Education to Business Success

A majority of research on the relation of education to business success has focused on answering two specific questions. First, are entrepreneurs as educated as the general public, and second, are people with more education more likely to start their own businesses than less educated people (Robinson & Sexton, 1994). Therefore, the focus of this study is to investigate the effect of educational background on small business entrepreneurs. In other words, does educational background help an entrepreneur or a small business person succeed?

Review of the literature showed that several studies attempted to explore and describe the characteristics of successful entrepreneurs. One of the early reports is a study conducted in 1960 by the Bureau of Business Research at the University of Georgia (Davis, 1963). The study used a survey to compare the characteristics of over 4000 small business founders in Texas and Georgia and used Dun and Bradstreet Reference Book and the Standard Industrial Classification to select the sample from manufacturing, retail, service and wholesale sectors (Davis, 1963, p. 3).

Nothing in the report leads to the conclusion that any kind of degree of education is indispensable to success in business. The study major findings pertaining to education were first and most valuable, mathematics. Second, a relationship between the education level and the decision to found a business. Thirdly, the level of education of founders is

higher than that of the adult population in their area. And fourthly, a positive relationship between the education level and business growth (Davis, 1963, p. 78).

Meanwhile, many founders attested to the value they had found in their own education and to the specific help certain types of education had given them in starting and operating their businesses. At the same time, lack of training in accounting, bookkeeping, general business, and advanced education put the founders at a disadvantage in their business operation (Davis, 1963, p. 60).

In his study of the training and educational needs of small business practitioners, Kiesner (1984) surveyed more than a 1000 small businesses for the purpose of designing better courses and programs in the area of small business. The author stated that there is a positive relation between education and success in big business but due to the small return rate and the skewness of responses, his study found no significant relation between education and business success.

At the same time, the study found that those who are older, been in business for a number of years, are in manufacturing and construction, and more educated supported the positive value of educational background to business success (Kiesner, 1984, p. 181). The author also added that the owners agreed that colleges and universities provide a good and general background but did not provide the specialized knowledge needed in the daily operation of the business (Kiesner, 1984, p. 211).

Robinson & Sexton's (1994) study of self-employment surveyed more than 2,000 entrepreneurs to investigate the relation between education and self-employment success. The study used three empirical models to estimate earnings. They found that education

had a close relation to entrepreneurship, and entrepreneurs do have higher level of education than those do in the wage and salaried sector. The study also showed that higher levels of education increase both the probability of becoming self-employed and the success of individuals (Robinson & Sexton, 1994, pp. 153-154). Even though the study demonstrated that entrepreneurs are highly educated with a positive relation between education and the entrepreneurial outcomes, it did not show the influence of specific types of education on business success.

Entrepreneurs Educational Backgrounds

Until recently there was always a belief that entrepreneurs are poorly educated. In his research, relating education to entrepreneurial success, Douglas (1976) study of 153 small businesses in Atlanta found that entrepreneurs have much more formal education than the general population. Douglas concluded that while entrepreneurs may have been poorly educated in the past it is no longer the case. Douglas also cited studies by Mayer & Goldstein (1961), and Collins & Moore (1964) to show a trend of the increasing educational levels of entrepreneurs.

The literature shows that entrepreneurs are no longer poorly educated and their levels of education is increasingly higher. Such a statement raises the following questions: Does educational background of entrepreneurs differ from the general population? Does educational background differ among male and female entrepreneurs? Does education background differ among ethnic entrepreneurs? Lastly, does education background of entrepreneurs differ according to business types?

Educational Background and General Population

Several studies support the idea of entrepreneurs being better educated than the general population. A 1986 Canadian study cited by Robinson & Sexton (1994) supported the idea that entrepreneurs are more educated than the general population. They found that Canadian entrepreneurs had an average of 13 years of formal education and more than 33% of participants reported over 15 years of education (p. 143).

In his research titled, *The Psychology of the Entrepreneur*, Brockhaus (1982) cited the following three studies as they relate to the educational level of entrepreneurs. The first was a 1970 study by Collins & Moore that examined the level of education among business people. They found that the percentage of entrepreneurs who had graduated from college was three times of the general population (Brockhaus, 1982, p. 45). The second one was by Robidox & Garnier in 1973 that studied the level of education of entrepreneurs in high-tech firms. The study showed that the more educated the entrepreneurs, the higher the rate of growth of the firm; however, they found no differences between the performance of those with a management background and those with engineering training (Brockhaus, 1982, p. 46).

Douglas (1976) conducted the third study (Brockhaus, 1982, p. 48), which showed that while the percentage of people holding college degrees increased from 7.5% to 10.7% from 1960 to 1970, college educated entrepreneurs increased from 9% to 37% from 1961 to 1975. Douglas also found no significant correlation between educational background and success measures (rate of growth) among 153 owner-operators of firms with 30 or fewer employees. Furthermore, studies conducted by Cooper & Dunkelberg

(1987), Robinson & Sexton (1994), and Foley & Griffith (1998) consistently demonstrated entrepreneurs with significantly higher levels of education than the general population.

Other studies compared the level of education between managers and entrepreneurs. As reported by Brockhaus (1982), Brockhaus & Nord (1979) used a multidiscriminant analysis procedure to compare the educational level of new business owners and managers. The personal environmental characteristics in the discriminate functions included the level of education attained. They found that the level of education to be significantly less for entrepreneurs than for managers. The entrepreneurs averaged 13.57 years of education while managers averaged 15.74 years. It was noted that the level of education of entrepreneurs did exceed that of the average person (Brockhaus & Nord, 1979).

This lower level of education of entrepreneurs according to Brockhaus & Nord (1979) may have limited their ability to obtain challenging and interesting jobs. As work was not sufficiently challenging and opportunities lacking for promotion to more desirable jobs, the entrepreneurs in this study chose to start their own business. At the same time, managers may have been able to obtain more satisfying jobs than do entrepreneurs because of their higher level of education (Brockhaus, 1982, p. 54).

Meanwhile, Cooper (1986) found in four different studies that technical entrepreneurs had substantial formal education. It was discovered that entrepreneurs have graduate degrees in 35% of the start-ups in Pittsburgh, 50% in Canada, 55% in Massachusetts, and 75% in Sweden. Such educational levels are much higher than the

population and are not surprising for firms dependent upon the development of new technology (Cooper, 1986).

In general, the literature supports the notion that more education is associated with more success. Vesper (1990) and Robinson & Sexton (1994) concluded that entrepreneurs with a good general education tend overall to be noticeably more successful than those with less favorable education and even more successful when general education is combined with experience. In addition, Robinson & Sexton's (1994) study of the effect of education on self-employment is one of the very few, if any, that addressed the relation of educational background to business success. The authors concluded that education in general has a positive and significant effect on bettering one's position to succeed. At the same time, they admitted their inability to study the effect of specific types of education as opposed to general levels of education (Robinson & Sexton, 1994, p. 154).

Educational Background, Age and Gender

While most of literature concentrated on differentiating entrepreneurs from the general population, some studies explored the entrepreneur's educational background among men and women. Humphreys & McClung (1981) studied female entrepreneurs from Oklahoma. They found that female entrepreneurs were more educated than both males and females in general, and more educated than male managers and administrators.

In his study of female entrepreneurs, Hisrich (1986) found that women are slightly older than men are when embarking on their first significant venture (35-45 vs. 25-35) and their educational background is different (more liberal arts vs. business and

engineering). He also added that most business started by men and women entrepreneurs differ in terms of the nature of the venture. Women are more likely to start a business in a service related area where men are more likely to enter manufacturing, construction, or high tech fields (Hisrich, 1986).

In a study conducted by Sletten and Hulaas in 1998 on a sample of male and female entrepreneurs from Norway, they found that the type of business concept is closely related to the entrepreneur's sex, educational background, and experience. There were more men than women within the manufacturing industry, and more women than men in the service sector. Technical and mechanical manufacturing are typically male-dominated areas as arts and crafts and health are areas dominated by females (Sletten & Hulaas, 1998).

Other studies have verified that female entrepreneurs tend to be older (Hisrich, 1986; Cuba et al, 1983) than the general population or the average adult female (DeCarlo & Lyonns, 1979), and have liberal arts degrees while men have business or technical degrees (Honig-Haftel & Martin, 1986).

Educational Background and Ethnicity

Small business ownership has always provided opportunities for minorities and immigrants. In recent years according to Lamping & Kuehl (2000), there has been substantial growth in minority owned businesses, including those owned by African-Americans, Hispanics-Americans, and Asian-Americans. However, few studies investigated the effect of race on the entrepreneur in general, or the effect of education on minority business ownership in particular.

Hornaday & Aboud conducted one of the earliest comparison studies between black and white business owners, in 1971. The study compared racial characteristics of successful entrepreneurs. The authors found that white owners were more likely to have graduated from college and reported that 32% of the blacks and 82% of the whites had graduated from college (p. 149). Gomolka (1977) studied the characteristics of 220 minority business owners and their businesses. Gomolka compared his sample with a study of white businesspersons in the manufacturing industry and found the minority sample to be younger and better educated but from similar family background as the white business persons.

Hisrich & Brush (1986) compared the demographics and business problems of 217 minority business owners. They found the typical minority business owner to be the eldest child, held a college degree, had related industry experience and lacked business training. Using data from the 1960s and 1970s, Auster (1988) also examined the characteristics of Black and White business owners and their business. Black business owners are found to have fewer years of education and experience.

In his study of minority small business owners, Feldman (1991) compared different groups of 172 minority owners. Among other findings, Feldman found the sample participants to more likely to have a college education when compared to the NFIB samples of independent business owners. Among the sample participants, Asian business owners (84%) were more likely to have a college degree than American Indians (33%), Hispanics (51%), and African Americans (54%). In addition, a survey of 5000 Asian-American business owners in Silicon Valley revealed that many are highly

educated with one-third having a graduate degree and four out of five having at least a college degree (Lambing & Kuehl, 2000, p. 30).

In general, the levels of education of entrepreneurs among all ethnic groups have increased considerably. Due to strong business competition and high technology in today's economy according to Scott, et al., (1998), Sletten & Hulass, (1998) and Brockhaus & Horwitz (1986) current and future entrepreneurs tend to be younger and highly educated.

Educational Background and Business Type

As mentioned earlier, the literature supports the importance of education to business success. One of the major limitations of entrepreneurship and small business research according to Brockhaus & Horwitz (1986) is a failure to identify the type of business studied. The authors cautioned that the characteristics, including educational background, associated with opening a service business might be different from those associated with opening a manufacturing business (Brockhaus & Horwitz, 1986, p. 58).

Few studies attempted to discuss the educational background of entrepreneurs in different types of businesses. Cooper's (1982) study of entrepreneurship cited Edward Roberts' 1972 research on survival and discontinuance on three groups of entrepreneurs. Roberts (1972) reported that the first group was in manufacturing and found that the combination of education (one or more years in college) and prior industry experience was associated with the greatest success. Roberts also added that education or experience alone was better than the combination of inexperience and little education. The second group, which was in retail, had similar findings where less than 10% completed college

and greater education was associated with success. The third group was in high tech firms and the founders tended to be highly educated (Cooper, 1982, pp.197-200).

Cooper (1982) also noted that founders with similar industrial experience tended to be more successful, and founders with a masters' degree were more successful than those with only a bachelors' degree. In addition, several studies of manufacturing and high-tech start-ups suggested that teams tend to be more successful than are individual founders. Cooper explained that teams usually have a broader base of skills, experience, education, and are able to give one another psychological support (Cooper, 1982, p. 202).

In his book, *Entrepreneurs in high technology*, Roberts (1991) compared technical entrepreneurs with business leaders and the general population. He found that technical entrepreneurs are much better educated than both groups, with the technical entrepreneurs heavily skewed toward the highest level of education. Other studies cited by Roberts (e.g., Van de Van et al., 1984; Teach et al., 1985; Simlor et al., 1989) supported his findings where most of high tech entrepreneurs are highly educated with advanced degrees (Roberts, 1991, p. 61).

Collins & Moore (1970) reported that in Michigan the number of college graduates among business executives was higher than among manufacturing entrepreneurs. However, the percentage of manufacturing entrepreneurs who had graduated from college was three times that in the adult Michigan population (p. 55).

In summary, great emphasis has been placed on the value of general post-secondary education to the adult and very little, if any, on the value of specific areas of education. Robinson & Sexton (1994) and Scott et al., (1998) agree that a study of the

correlation between founder's college educational background and small business success could be of value in better understanding the degree of the relation. Therefore, the primary focus of this study was to investigate the relation between college educational backgrounds as it relates to small business success.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

Introduction

The research in this study was a quantitative survey research method. Eleven hundred small businesses from four different industries (manufacturing, retail, services, and wholesale) in the Dallas, Fort Worth, and Denton areas were surveyed. The survey instrument shown in Appendix A, which was cross-sectional, was designed to collect data about established small businesses in Dallas, Fort Worth, and Denton, to describe the relationship between educational backgrounds of business founders and small business success. The survey instrument was composed of demographic items, business items, education items, and success and growth items used in similar previous research with minor modifications. The Statistical Package for the Social Sciences (SPSS12) software program was used to analyze 228 usable responses. Out of 260 returned surveys, 24 surveys were not usable.

The research design, population, selection of the sample, procedures for collecting data, the instrument used, treatment of the data, including coding and statistical techniques and tests used in this study are also explained in this chapter.

Research Design

Survey research was used to explore whether or not a relationship existed between college educational backgrounds of small business founders, defined as the college major

and/or educational level and business success as measured by longevity, sales growth and employment growth. Using a survey made it possible to assess accurately the characteristics of a whole population by studying samples (Kerlinger, 1986, pp. 377-378).

Such a design allowed a correlation research method that explored the relationship among different variables to gain a better understanding of factors that contribute to a more complex understanding of the topic (Mertens, 1998, p. 93). The correlation research method also allowed the researcher to explore and analyze the relationship between two or more variables at a time (Gall, Borg & Gall, 1996, p. 414). In addition, the method provided information concerning the degree of the relationship among the variables studied (Gall et al., 1996).

Therefore, a correlation method was used to explore the relation between the dependent variable business success, namely sales volume, number of employees and longevity, and the independent variable educational background, namely education major and education level, in addition to several explanatory factors such as gender, age, ethnicity, and industry, as shown in Figure 1.

As presented in Figure 1, this study attempted to explore the relation between college educational background, namely education level and education major, and small business success, namely sales, number of employees, and longevity. The figure also illustrates the association between educational background, age, gender, ethnicity, and industry as they relate to business success. (see Figure 1).

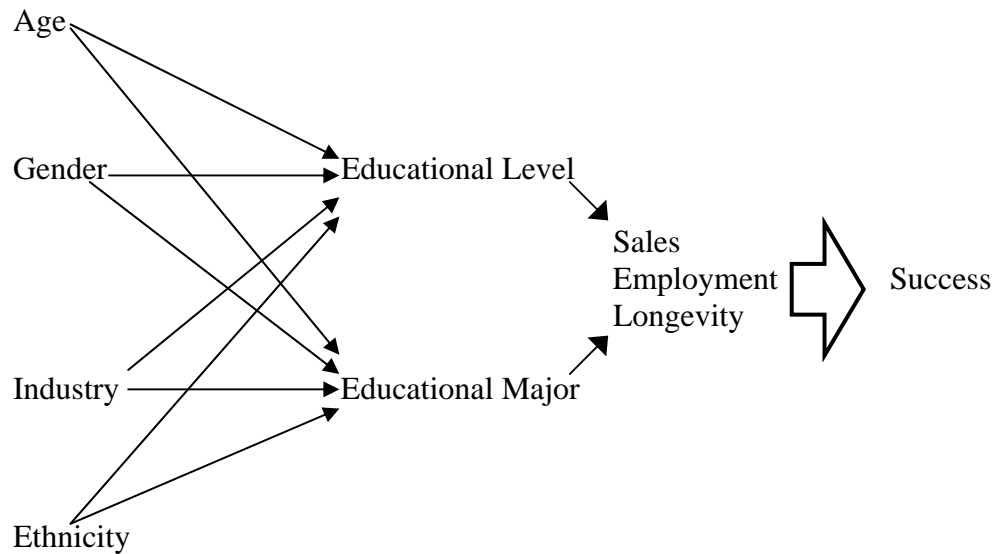


Figure 1. Educational background and small business success.

As previously discussed, research has shown that education does seem to have a positive impact on success in small business (Scott, et al., 1998; Robinson & Sexton, 1994). Most of this research has concentrated on describing the characteristics and behaviors of entrepreneurs, business start-ups, or entrepreneurial intentions. In addition, educational background was marginalized as a demographic factor that resulted in mixed and some times contradicting findings pertaining to the influence of college educational background on small business success.

The following null hypotheses were tested to attempt to describe if educational background does help the entrepreneur/small business person succeed.

Hypothesis A: There is no relation between the college educational level of the founder and small business success.

Hypothesis B: There is no relation between the college educational major of the founder and small business success.

Hypothesis C: There is no relation between college educational level when associated with age, gender, race or industry and small business success.

Hypothesis D: There is no relation between college educational major when associated with age, gender, race or industry and small business success

In addition to testing these hypotheses, the following models were used to measure the correlation between educational backgrounds and small business success.

For hypotheses A and B, the success model consisted of:

Dependent variable: Business success (sales, number of employees, longevity)

Independent variables: College educational level
College educational major

For hypotheses C and D, the success model consisted of:

Dependent variable: Business success (sales, number of employees, longevity)

Independent variables: College educational level
College educational major
Age
Gender
Ethnicity
Industry

The focus of the study included two factors of the educational background of small business founders - education level, and education major. Education major was divided into 10 categories of education major fields, to insure a mutually exclusive list of majors, which were collapsed into five major categories - arts & humanities, professional, natural sciences, technology & information, and no major. The level of education was divided in five categories - high school or less, some college, bachelors, masters, and doctorate. The adopted categories of education backgrounds were used by several studies

in the literature (e.g., Acs, 1999; Faris, 2003; Hyungrae & Jinjoo, 1996; Robinson & Sexton, 1994).

Business success was measured by sales volume, number of employees, and longevity, which were divided into five categories. For instance, business age was subdivided into, 0 to 4, 5 to 10, 11 to 15, 16 to 20, and 21 or more years (e.g., Montagno, 1986). Sales volume was divided into, 0 to \$200,000, \$201,000 to \$500,000, \$501,000 to \$1000, 000, \$1001, 000 to \$2,000,000, and \$2,000,000 or more in sales (e.g., Ibrahim & Goodwin, 1986). Finally, number of employees was divided into, 0 to 5, 6 to 10, 11 to 15, 16 to 20, and 21 or more employees.

In addition, the study measured the relation between educational background, business success, and the demographic variables of business founder such as age, gender, ethnicity, and industry. For instance, age of founder was divided into five categories, 25 or younger, 26 to 35, 36 to 45, 46 to 55, and 56 years or older (e.g., Ibrahim & Goodwin, 1986; Kiesner, 1984). While gender was divided into male and female categories, ethnicity was categorized into Caucasian, African American, Asian, Hispanic, and other. Industry was also divided into four categories, manufacturing, retail, service, and wholesale (e.g., Acs, 1999; Faris, 2003; Headd, 2000).

As shown in the Appendices, a cover letter, the instrument, and the procedure for collecting data were submitted for approval to the University of North Texas Review Board for the Protection of Human Subjects in Research (IRB).

Population and Sampling Procedure

The total population according to Dun and Bradstreet (2003) of registered small businesses at Dallas, Fort Worth, and Denton areas as of December 2003 was 18,875 businesses with 1400 businesses in manufacturing, 1500 businesses in wholesale, 5550 businesses in retail, and 12,200 businesses in services. The Dun and Bradstreet (D&B) database of small business provided a list of the registered small businesses for the area. The D&B database according to Sexton & Smilor (1997) offers the most comprehensive, contemporaneous, and publicly accessible micro-data in the country. Moreover, the data are a prime sampling frame, have been used extensively, and interesting research continues to come from it (p. 355).

The target population of this study was the registered small businesses in the Dallas, Fort Worth, and Denton areas that have 20 or fewer employees, less than three million in annual sales, independently owned, and has been operating the business for 5 or more years. Small businesses that are 4 years of age or less were excluded for two reasons, (1) a successful business in this study is 5 years or older, and (2) the small business high failure rate in the early years of operation.

The potential population was stratified according to the type of business (e.g., wholesale, retail, manufacturing, and service). Stratifying according to Weisberg, Krosnick & Bowen (1996) helps maximize the accuracy in a sample because it ensures that certain population proportions are matched in the sample. It is also useful in increasing accuracy when two groups differ widely on the topic being studied, yet within each group are very similar (pp. 45-46).

Sample error according to Hinkle (1988) and Kerlinger (1986) is related to sample size where the larger the sample the smaller the error. To minimize sampling error Kerlinger (1986) recommended using 30 or more cases for each predictor variable. This study included six predictor variables that required a minimum sample population of 180 usable responses. The sample in this study included a stratified random sample of 1100 small businesses that was randomly drawn from the target population. The sample was randomly selected from the stratified population to ensure the equal proportional presentation of business types. For instance, the target population was divided into 4 business types (wholesale, retail, manufacturing, and service). The sample represented equal percentages of business types in the target population.

Instrument

Prior research provides the framework for this model and identifies the need for empirically testing this framework. Greenberger & Sexton (1988, p. 7) noted that valid test instruments are available to measure some of the factors, but for others, instruments must be developed and validated.

Furthermore, the literature indicates the need to modify prior instruments since they were intended to measure different domains. Shaver & Scott (1991) noted that pre-existing valid instruments may not be appropriate for application without some modification and their validity diminishes when used outside their intended domain.

As any other research instrument, a questionnaire must be subjected to the validity and reliability that apply to other data collection measures. Validity of the survey according to Weisberg, et al., (1996), means the survey should measure the concept that

is intended to measure. The survey's content validity was verified by including questions that measured all the important aspects of the concepts in this study. If the survey lacks content validity, questions were added to measure additional aspects of the concept (p. 95). In addition, the survey questions, with assistance from the College of Education center for interdisciplinary research and analysis (CIRA), were exhaustively discussed, critiqued, and re-written. Such process helped to warrant a mutually exclusive coverage, representation of population and the research questions addressed in this study.

As mentioned earlier, all the questions in this survey pertaining to measuring business success and owners opinion regarding their business performance are based upon prior research within similar domains of interest. These questions were tested and used by previous similar studies. The question pertaining to success measures are based on quantified objective data and were subjected to reliability testing. Solymossy (1998) tested the questions for reliability of response by using two groups. Using the MANOVA, he analyzed the responses and found the questions reliable for interpretations since there were no significant differences in responses between the two groups (Solymossy, 1998, p. 83). In addition, the questions in both studies Kiesner (1984) and Solymossy (1998) were subjected to panel discussion and validation.

The instrument in this study was a three-page survey. The survey held four categories, labeled A (manufacturing), B (retail), C (service), and D (wholesale) to distinguish between the four types of businesses to be surveyed and to insure equal representation. The majority of questions in this survey were used in previous similar studies. The first section contains the demographic items. The second section contains the

business items. The third section contains the educational items. In addition, the fourth section contains the success indicators (see instrument in Appendix C).

The questions in this research were designed to meet the following criteria:

1. The questions were related to the research problem and the research objectives.
2. The questions were appropriate to small business founders in their environment.
3. All items in the questions were clear and unambiguous.
4. Constructions of the questions were based upon theoretical premises related to the study.

The demographic items include current owner age, gender, race, educational level, education major, and years of formal education. Such items were requested to provide a description of the population and to determine if any of the demographic variables are associated with business success.

The business items included business age, owner age upon starting the business, the reason for starting the business, previous experience, number of owners, source of funds, type of business, type of product, and technology use. Such questions were requested to provide information regarding business longevity, the nature of the business, and outside help or influence. Also to describe if there were any relationships between education and starting a business, type of business, or any other influential factors.

The education items included education levels, education majors, education and business type, experience and business type, education value, lack of education, and the respondent opinion on the benefits of college education before and after starting a

business (Kiesner, 1984). Requesting such questions described the respondent's educational background and if it was related to the business field. It also described the values and benefits of college education as these relate to starting and maintaining the business. In addition, it described if different educational levels or majors are associated with different levels of business success. Furthermore, it provided a chance for the respondents to relate to the value or the lack of a college education as they proceed in their business venture.

The success items included sales volume, years in business, and number of employees. Questions related to success measures were used based upon review of literature related to measures of business success that have been used by similar studies (e.g., Ibrahim & Goodwin, 1986; Kiesner, 1984; Solymossy, 1998).

The success question for longevity was asked to show how long the business been operating. The age of the business, 5 years or more, indicates continuing success and survival (Ibrahim & Goodwin, 1986). The sales question also showed the continuing trend and growth of sales in the last five years that were associated with success.

The end of the survey included open-ended questions relating to the problems faced by the founder before and after starting the business. Also included, was a chance for the respondent to express his/her opinion on the value or the lack of education to their business, if any, that was not addressed in the questionnaire.

Following the process of developing and modifying the survey instrument, data were collected by mailing the questionnaire to a randomly selected a sample of small

businesses in the North Texas area. The survey was structured to produce the necessary information related to small business issues addressed in this study.

Data Collection

The following procedures were used for the collection of data.

A list of all small businesses in Dallas, Fort Worth, and Denton areas was obtained from the D&B database of small businesses. A random sample consisting of 200 or more businesses was selected from the qualified target population. The survey was mailed to the selected sample along with a self-addressed stamped envelope. Two weeks following the initial mailing, a reminder letter was mailed to the whole sample. Two weeks following the second wave, a phone call was made to the non-respondents and a copy of the questionnaire was mailed, if requested by the non-respondents.

After eight weeks of follow up efforts, a response rate of 23.6% (260 returned surveys) was achieved. Upon reviewing and inspecting the surveys, 228 surveys (20.7%) were usable. Data from the survey were collected, coded, and analyzed using several statistical techniques and tests. It must be noted that the sample was collected for businesses that are considered successful. Due to the fact that D&B database of small businesses is updated quarterly, no data was collected from businesses that were no longer in operation.

Data Analysis

Previous research has shown that general education does seem to have a positive impact on small business success. However, such research was limited and did not

provide any concluding evidence supporting the relation of any particular education to such success (Robinson and Sexton, 1994; Scott et al., 1998). This study reviewed the concepts of entrepreneurship and small business and most importantly investigated the relation between educational background and small business success.

The major focus of this study was to describe the relation between the independent variable educational background and the dependent variable small business success. Educational background was defined as the college major and/or level of education. Small business success was defined as surviving for five or more years and achieving positive sales and employment growth.

In order to describe the relation between educational background and business success, the Pearson's correlation as a measure of association was chosen. Pearson r according to Gall et al. (1996) is the most widely used bivariate correlational technique. It allows to measure the correlation between continuous scores and because r has a small standard error. It also calculates for any two sets of scores even if one or both measures do not yield scores in continuous form (Gall et al., 1996, p. 427).

Pearson's correlation also measures, according to Kerlinger (1986), the amount of variance shared by the variables. However, Pearson r fails to allow for quantifying or determining of the direction and strength of the relationships. For this reason, Spearman's correlation, which measures both the direction and the extent of association between the variables, was considered. Spearman's correlation was chosen because the variables for testing question one and question two were listed in ordinal form. Another reason for

using Spearman's correlation was to test for direction and strength of relationships (Miller & Saklind, 2002, p. 389).

Descriptive statistics (cross tabulation) were calculated for all educational levels and educational majors with success variables. The Pearson's correlation was used in question one and question two to measure the relation between business success and educational level and then educational major. Spearman's correlation was used in question one to determine the direction and strength of the relation between educational level and business success.

The one-way ANOVA was used for testing the second question to determine whether a relationship existed between the means of business and non-business majors as they relate to small business success. The one-way ANOVA was the most reasonable technique for testing differences between means when the independent variable has various levels (Hinkle, 1988). The use of ANOVA was appropriate because the study tested a relation between the frequencies of ordered variables (Kerlinger, 1986, p. 134). In addition, an independent sample *t*-test was also used to test for the homogeneity of mean and if the difference between means was significant.

A canonical correlation analysis was performed between the educational level and success variables, and education majors and success variables to determine the maximum correlation between the two sets. Using such multivariate correlation method is appropriate in exploring the relationship between background and outcome variables. It is also the most appropriate technique to use when testing the relation between a set of

independent variables and a set of dependent variables (Tabachnick & Fidell, 2001; Grimm & Yarnold, 2001).

Canonical correlation according to Thompson (1988) is a logical extension of multiple regressions. It handles the relation between sets of independent variables and sets of dependent variables, which make it a powerful method of analysis (Kerlinger, 1986; Thompson, 1988). Canonical correlation analysis shares the same assumptions required by other general linear model analysis including robustness. Therefore, it is appropriate for use with scaled, as well as continuous variables (Thompson, 1988; Knight, 1989).

The alternating least square optimal scaling (ALSOS) procedure was used to transform the data. ALSOS transformation procedure according to Jacoby (1999) and Halbrook (2001) assigns numeric values that maintain the specific measurement characteristics for the data and fit the statistical model as well as possible. In addition, it improves the linearity and distribution normality of the data. As a result, the correlation between the predictor variables and independent variables is as large as possible (Jacoby, 1999).

In addition, interpreting the values of correlation coefficients between the variables according to Kerlinger (1986) depends on levels of significance and sizes of samples. For large samples, r 's between .20 and .30 are statistically significant (Kerlinger, 1986; Tabathnick & Fidell, 2001). Generally, the literature suggests according to Miller & Salkind (2002) that correlation coefficients are interpreted as follows: .0 to .2 as little or no relationship, .2 to .4 as some slight relationship, .4 to .6 as

substantial relationship, .6 to .8 as strong useful relationship, and .8 to 1.0 as very strong relationship (p. 388).

CHAPTER 4

FINDINGS

Introduction

This chapter is divided into three sections. The first section presents the sample overview, the demographic and the characteristics breakdown of sample participants. The second section reports the findings resulting from analysis of the data. The third section presents the discussion and comparison of the findings.

The survey used in this study was mailed on April 30, 2004. The surveys used for analysis were completed and returned for analysis by June 30, 2004. The actual rate of return for useable surveys was 23.6%, which was the product of 260 returned responses divided by the total of 1100 distributed surveys (see Table 5).

During the eight weeks of mailing and collecting of responses, 43 participants refused to participate in the study, 21 surveys and 4 reminder cards were undeliverable due to address problems. In addition, 27 people requested a second survey, and 500 randomly selected participants were contacted by telephone as a second reminder to return the survey.

Of the 260 returned, 236 surveys were usable, and 24 surveys were not usable due to missing responses or a returned blank survey. Of the 236 usable surveys, eight responses were dropped due the following reasons: (1) four businesses were operating for less than 4 years; (2) two businesses had more than 50 employees, and (3) two businesses

had more than \$3,000,000 in sales. Any of which placed them outside the definition used for this study. These results are presented in Table 5.

Table 5

Sample Overview

Participants	Number	Percentage
Distributed	1100	100 %
Undeliverable	21	2 %
Decline	43	4 %
Population	1036	94 %
Returns	260	23.6 %
Unusable	24	2.2 %
Usable	236	21.5 %
Removed	8	0.7 %
Net Usable	228	20.7 %

As shown in Table 5, the survey was distributed to 1100 businesses, and after eight weeks of mailing, re-mailing, and reminding participants to return the questionnaire, 260 (23.6%) surveys were returned. Upon inspecting the returned surveys, 236 (21.5%) surveys were found usable to conduct the statistical analysis for this study. After removing eight responses, the total usable responses were 228 (20.7%) surveys. The SPSS 12 software was used to test the research questions addressed in this study.

Demographic Breakdown of Sample

As described in Table 5, 228 usable surveys were used to test the relationship between college educational background and small business success. In the following section, the results of the demographic breakdown of business owner's who decided to participate in the study are presented in Table 6. The results of the characteristic breakdown of businesses that participated in the study are presented in Table 7.

As stated earlier in the research design and methodology chapter, the adopted variable categorization in both Tables 6 and 7 are based on categories used for similar variables in similar studies.

Demographic Breakdown of Business Owners

Demographically, the sample included 154 male participants (68%), and 190 white owners (83%). While 149 owners (59%) are 35 years of age or younger, 154 owners (67%) attained a college degree, and 126 owners (55%) were in the professional field (see Table 6).

As shown in Table 6, the sample did not reflect the actual ethnic distribution of the population. Consequently, the sample was divided into two ethnic groups - a white group of 190 participants (83.3%), and a non-white group of 38 participants (16.7%). In addition, the sample included one owner in the category of 55 or older. In order avoid any outlier effect on the statistical analysis, the participant was added to the previous age category.

Table 6

Demographic Breakdown of Business Owners

Variable	Category	Frequency	Percentage	Cumulative
Gender	Male	154	67.5	67.5%
	Female	74	32.5	100.0%
Ethnicity	White	190	83.3	83.3%
	African American	7	3.1	86.4%
	Hispanic	10	4.4	90.8%
	Asian	14	6.1	96.9%
	Other	7	3.1	100.0%
Age	25 or less	31	6.6	6.6%
	26 to 35	118	58.8	65.4%
	36 to 45	66	28.9	94.3%
	46 to 55	12	5.3	99.6%
	56 or older	1	0.4	100.0%
Education level	High school or less	18	7.9	7.9%
	Some college	56	24.6	32.5%
	Bachelors	89	39.0	71.5%
	Masters	53	23.2	94.7%
	PhD	12	5.3	100.0%
Education major	Humanities	45	19.7	19.7%
	Sciences	15	6.6	26.3%
	Professional	126	55.3	81.6%
	Tech & Information	32	14.0	95.6%
	No major	10	4.4	100.0%

Characteristic Breakdown of Businesses

Table 7 represents the characteristics of the small businesses that participated in the study. A breakdown of each characteristic according to the categories specified in the study with frequencies and percentages of each category are shown in the table.

Table 7

Characteristic Breakdown of Businesses

Overview	Category	Frequency	Percentage	Cumulative
Industry	Manufacturing	25	11.0	11.0 %
	Retail	47	20.6	31.6 %
	Service	124	54.4	86.0 %
	Wholesale	32	14.0	100.0 %
Ownership	Single	135	59.2	59.2 %
	Partner	56	24.6	83.8 %
	Corporation	37	16.2	100.0 %
Employees	1 to 5	115	50.4	50.4 %
	6 to 10	62	27.2	77.6 %
	11 to 15	31	13.6	91.2 %
	16 to 20	12	5.3	96.5 %
	21 or more	8	3.5	100.0 %
Sales volume	0 to 200,000	56	24.6	24.6 %
	200,001 to 500,000	96	42.1	66.7 %
	500,001 to 1,000,000	37	16.2	82.9 %
	1,000,001 to 2,000,000	31	13.6	96.5 %
	2,000,001 or more	8	3.5	100.0 %
Longevity	0 to 5	12	5.3	5.3 %
	6 to 10	71	31.1	36.4 %
	11 to 15	55	24.1	60.5 %
	16 to 20	39	17.1	77.6 %
	21 or more	51	22.4	100.0 %

As presented in Table 7, the characteristics of participants do conform to the guidelines of the small business definition mentioned earlier in the study. The table also shows that the sample represented the typical population of small business. The service sector dominated the sample with 54% of the participants, and single ownership

represented 60%. While 51% of businesses have 5 or less employees, 67% have \$500,000 or less in sales. Furthermore, 61% of businesses were established since 1990.

Results

The main objective of this study was to describe whether there was a relationship between the college educational background of business founders and small business success. To achieve the objectives of this study, the relationships between small business success and business founder's educational background were tested. Sales volume, number of employees, and longevity represented small business success. Educational level and educational major represented the educational background. In addition, owner age, gender, ethnicity, and business type were also tested in association with college educational background as they relate to business success.

The results and findings of the statistical analysis of each question addressed in this study are presented in the following sections.

Research Question 1: Relationship between Owners' Educational Level and Small Business Success

The first purpose of this study was to investigate whether or not there was a relationship between the owners' educational level, as degree level or years of formal education level, and small business success. Educational level was rated on a 5-point ordinal scale where 1 equals the lowest level, and 5 equals the highest level. Sales, number of employees, and longevity were also rated on a 5-point ordinal scale where 1 equals the lowest level and 5 equals the highest level. Due to the substantial skewness in both sales and number of employees where 67% of businesses have \$500,000 or less in

sales and 51% of businesses have five or less employees, transformed values for both sales and employees were used. The literature support the use of transformed values (e.g., Jacoby, 1999), in order to improve the linearity and the normality of a variable distribution.

The Pearson’s correlation analysis was used to determine whether a relationship existed between owners’ educational degree level and business success. The computed values of the Person’s correlation were found to be 0.153, 0.810, and 0.203 for sales, number of employees, and longevity respectively with a 0.01 level of significance. These values were found significantly not correlated, as shown in Table 8.

Table 8

Pearson’s Correlation of Business Success by Owner Educational Degree Level

Variable	Statistic	Sales	Employees	Longevity
Education degree	Pearson Correlation Sig. (2-tailed)	0.095 0.153	0.016 0.810	-0.085 0.203
Sales	Pearson Correlation Sig. (2-tailed)	1 .	0.630** 0.000	0.173** 0.009
Employees	Pearson Correlation Sig. (2-tailed)	0.630** 0.000	1 .	0.047 0.480

** $p < .01$.

As shown in Table 8, the owner’s educational degree level is not significantly correlated with sales, number of employees longevity. However, the results show that sales are significantly correlated with employees and longevity. Such a correlation

implies that higher levels of sales require larger number of employees and produce higher levels of revenues that will help the business survive and sustain successful operation.

Moreover, Pearson’s correlation was used to measure the correlation between education level, defined as years of formal education, and business success defined as levels of sales, number of employees and longevity. Years of formal education were rated on a 5-point ordinal scale where 1 equals the lowest and 5 equals the highest.

As shown in Table 9, the computed values of Pearson’s correlation found to be 0.164, 0.113, and -0.030 for sales, employees, and longevity respectively with a 0.05 level of significance. It was found that educational level, as years of formal education, is significantly correlated with sales volume. Such a correlation implies that higher levels of years in formal education are associated with higher levels of sales volume.

Table 9

Pearson’s Correlation and Spearman’s Correlation of Business Success by Owner Years of Formal Education

Variable	Statistic	Sales	Employees	Longevity
Years of formal education	Pearson Correlation	0.164*	0.113	-0.030
	Sig. (2-tailed)	0.013	0.088	0.651
	Spearman Correlation	0.194**	0.118	-0.017
	Sig. (2-tailed)	0.003	0.075	0.797

* $p < .05$. ** $p < .01$.

However, in order to determine the direction and the strength of the relationship between years of formal education and business success, Spearman’s correlation was

applied. It was found that the value of Spearman's correlation for sales was 0.194. As shown in Table 9, the observed significant level ($p = 0.01$) was less than the accepted significance level for this study ($p = 0.05$) which indicated a strong and positive correlation.

As shown in Tables 9, it can be concluded with confidence that the relationship between the business owners' educational level, years of formal education, and business success, sales volume, was positive and statistically significant. Therefore, the null hypothesis that there was no relationship between the founder's years of formal education and small business success was rejected.

Research Question 2: Relationship between Founder's Educational Major and Small Business Success

The second purpose of this study was to investigate whether a relationship existed between the founder's college major and small business success. As stated earlier, educational major was categorized on 5-point nominal scale where 1 equals arts & humanities, 2 equals natural sciences, 3 equals professional, 4 equals technology & information, and 5 equals no-major.

The Pearson's correlation was used to determine whether a relationship existed between owners' educational major and small business success. The computed values of the Pearson's correlation were found to be -0.34, -0.009, and -0.077 for sales, number of employees, and longevity respectively with a 0.01 level of significance.

As presented in Table 10, the values indicated no significant correlation was found between the owners' educational major and the business success measures; sales,

number of employees and longevity. As shown in Table 10, college major was not significantly correlated with either sales, number of employees, or longevity. However, among the success measures, longevity had the closest association with college major. The table also showed that sales were significantly correlated with number of employees and longevity respectively.

Since Pearson's correlation did not show a significant correlation, the use of Spearman's correlation to determine the direction and strength of the relation between educational major and business success was not necessary.

Table 10

Pearson's Correlation of Business Success by Educational Major

Variable	Statistic	Sales	Employees	Longevity
Education major	Pearson Correlation	-0.340	-0.009	-0.077
	Sig. (2-tailed)	0.610	0.895	0.247
Sales	Pearson Correlation	1	0.630**	0.173
	Sig. (2-tailed)	.	0.000	0.009
Employees	Pearson Correlation	0.630**	1	0.047
	Sig. (2-tailed)	0.000	.	0.480

** $p < .01$.

To further investigate the relation between college major and business success, a one-way analysis of variance was used to determine whether a significant difference existed between-groups and within-groups of college majors as they relate to business success. As shown in Table 11, the one-way analysis of variance showed that the

computed values of F ratio were 0.972, 1.183, and 0.539 for sales, number of employees, and longevity respectively. The F ratios were found not to be significant at the level of 0.05. Table 11 indicates that the computed values of F ratios for sales, number of employees, and longevity are less than the critical value of F distribution from the table with 4 and 223 degrees of freedom, which is 2.65. This indicated that there was no difference between-groups and within-groups of college majors as they relate to sales, number of employees, and longevity.

Table 11

One-way Analysis of Variance of Business Success by College Majors

Variable	Source	<i>df</i>	Sum of Square	Mean Square	F Ratio	Sig.
Sales	Between groups	4	2.52	0.63	0.97	0.42
	Within groups	223	144.76	0.65		
	Total	227	147.28			
Employees	Between groups	4	5.47	1.37	1.18	0.32
	Within groups	223	257.45	1.15		
	Total	227	262.91			
Longevity	Between groups	4	148.02	37.00	0.54	0.71
	Within groups	223	15302.77	68.62		
	Total	227	15450.79			

* $p < .05$.

Finally, an independent sample t -test was conducted to determine whether significant differences existed between owners with business majors and those with non-

business majors as they relate to small business success. Educational major was divided into two categories where 1 equals non-business and 2 equals business.

As shown in Table 12, the means of business and non-business majors pertaining to sales, number of employees, and longevity showed minor differences. In order to determine whether these differences in means are significant, an independent sample *t*-test was tabulated. Included in the independent sample *t*-test, Levene's Test for Equality of Variances, is a test for the homogeneity of variance assumption of a valid *t*-test (see Table 13).

Table 12

Independent Sample t-test of Success by Business and Non-business Majors

Variable	Non-Bus = 1 Business = 2	<i>N</i>	Mean	St. Deviation	St. Error Mean
Sales	1.00	140	12.738	1.077	0.091
	2.00	78	12.838	1.076	0.122
Employees	1.00	140	1.652	0.838	0.071
	2.00	78	1.686	0.730	0.083
Longevity	1.00	140	15.350	8.375	0.708
	2.00	78	14.680	8.322	0.942

As shown in Table 13, the *F* probability values of sales, number of employees, and longevity were 0.945, 0.245, and 0.655 respectively, exceeded the 0.05 level of significance. Such values confirm the assumption that the homogeneity of variance has not been violated and the normal *t*-test based on equal variances (equal variances assumed) was used.

Since the Levene's test was not significant ($p > 0.05$), the t -values calculated by the equal variances assumed was appropriate (see Table 13, page 76). In addition, since the t probability values were (Sig. 2-tailed) .515, .751, and .571 for sales, number of employees and longevity respectively, the difference between means was not significant.

Since the difference between means was minor and was not statistically significant, it can be concluded that the difference between the means of owners with business majors and those with non-business majors as they relate to business success was not significant at the 0.05 level. This was also confirmed by the 95% confidence interval of difference for the difference between means that showed negative lower values and positive upper values, which include the H_0 mean difference of zero.

As indicated by Pearson's correlation, one-way ANOVA, and the independent sample t -test, education major when used as the only predictor of business success, did not show significant correlation with sales volume, number of employees or longevity. Therefore, the null hypothesis that there was no relation between the founders' educational major and business success was accepted.

Table 13

Independent Samples Test of Business Majors and Non-business Majors

Variable		Levene's Test for Equality of Variances		<i>t</i> -test for Equality of Means						
		<i>F</i>	Sig.	<i>t</i>	<i>df</i>	Sig (2-tailed)	Mean Differ- ence	Std. Error Differ- ence	95% Confidence Interval of the Difference Lower Upper	
Sales	Equal variances assumed	.005	.945	-.652	216	.515	-.0992	.1521	-.3991	.2006
	Equal variances not assumed			-.652	159.47	.515	-.0992	.1520	-.3996	.2011
Employee	Equal variances assumed	1.360	.245	-.305	216	.751	-.0345	.1132	-.2577	.1887
	Equal variances not assumed			-.317	178.44	.752	-.0345	.1089	-.2493	.1803
Longevity	Equal variances assumed	.200	.655	.568	216	.571	.6705	1.1807	-1.6566	2.9976
	Equal variances not assumed			.569	160.16	.570	.6707	1.1786	-1.6570	2.9980

 $p < 0.05$

Research Question 3: Relation between Educational Level when Associated with Age, Gender, Ethnicity, and Industry and Small Business Success

The third purpose of this study was to investigate whether or not a relationship existed between the founder's educational level when associated with age, gender, ethnicity and industry and small business success. All respondents were asked the same question pertaining to educational major, age, gender, ethnicity and industry. The categories, frequencies and percentage of each variable are presented in Table 14.

As stated in the research design and methodology chapter, independent and dependent variables categorization in both Tables 14 and 15 are based on categories used in similar studies.

As shown in Table 14, levels of education were rated on a 5-point ordinal scale where 1 equals the lowest level and 5 equals the highest level. Age was also categorized on a 5-point ordinal scale where 1 equals the youngest category and 5 equals the oldest category. While gender was categorized on a 2-point nominal scale where 1 equals male and 2 equals female, race was categorized on a 2-point nominal scale where 1 equals white and 2 equals non-white. Industry was also divided into four nominal categories where 1 equals manufacturing, 2 equals retail, 3 equals service, and 4 equals wholesale.

Table 14

Independent Variables Categories

Independent Variable	Category	Frequency	Percentage
Education level	1 = High school or less	18	7.9
	2 = Some college	56	24.6
	3 = Bachelors	89	39.0
	4 = Masters	53	23.2
	5 = PhD	12	5.3
Age	1 = 25 or less	31	6.6
	2 = 26 to 35	118	58.8
	3 = 36 to 45	66	28.9
	4 = 46 to 55	12	5.3
	5 = 56 or older	1	0.4
Gender	1 = Male	154	67.5
	2 = Female	74	32.5
Ethnicity	1 = White	190	83.3
	2 = Non-White	38	16.7
Industry	1 = Manufacturing	25	11.0
	2 = Retail	47	20.6
	3 = Service	124	54.4
	4 = Wholesale	32	14.0

$n = 228$

As shown in Table 15, sales, number of employees, and longevity were categorized and rated on a 5-point ordinal scale where 1 equals the lowest level and 5 equals the highest level.

Table 15

Dependent Variables Categories

Dependent Variable	Category	Frequency	Percentage
Sales volume	1 = 0 to 200,000	56	24.6
	2 = 200,001 to 500,000	96	42.1
	3 = 500,001 to 1,000,000	37	16.2
	4 = 1,000,001 to 2,000,000	31	13.6
	5 = 2,000,001 or more	8	3.5
Employees	1 = 1 to 5	115	50.4
	2 = 6 to 10	62	27.2
	3 = 11 to 15	31	13.6
	4 = 16 to 20	12	5.3
	5 = 21 or more	8	3.5
Longevity	1 = 0 to 5	12	5.3
	2 = 6 to 10	71	31.1
	3 = 11 to 15	55	24.1
	4 = 16 to 20	39	17.1
	5 = 21 or more	51	22.4

A canonical correlation analysis was used to determine whether a relationship existed between owners' educational level when associated with age, gender, race, and industry, and small business success. Because this study investigated a relationship between a set of independent variables and a set of dependent variables, the use of canonical correlation analysis was appropriate (Kerlinger, 1985).

In order to improve the analysis quality of variables with lower scales of measurements (nominal and ordinal) and improve the linearity of variable distribution according to Jacoby (1999), and Halbrook (2001), an alternating least squares optimal scaling procedure was used. In such an approach, the variables are assigned numeric

values that maintain the specific measurement characteristics for the data and fit the statistical model as well as possible. This means that optimal scaling provides the best (goodness of fit) set of numeric values between the model and the observations (Jacoby, 1999; Halbrook, 2001). As a result, the correlation between the transformed predictors and transformed dependent variables is as large as possible.

The first step in a canonical correlation analysis is generation of a correlation matrix. Table 16 presents the correlation matrices between the two sets of variables.

Table 16

Question Three Canonical Correlation Matrix

Variable	Independent Variables					Dependent Variables		
	Edlev	Owage	Gend	Race	Indust	Sale	Empl	Long
Edlev	1.00	-.01	.03	.09	.18	-.13	-.18	-.13
Owage	-.01	1.00	.09	-.11	-.12	.05	.35	-.10
Gend	.03	.09	1.00	-.06	-.05	-.12	.16	-.13
Race	.09	-.11	-.06	1.00	.12	-.09	-.07	-.20
Indust	.18	-.18	-.05	.12	1.00	-.13	-.06	-.15
Sale	-.13	.05	-.12	-.09	-.13	1.00	.12	.19
Empl	-.18	.35	.16	-.07	-.06	.12	1.00	.60
Long	-.13	-.10	-.13	-.20	-.15	.19	.60	1.00

$p < 0.05$

In Table 16, the correlation matrix was subdivided into four parts: the correlation between the independent variables (IVs), the correlation between the dependent variables

(DVs), and the two matrices between the IVs and the DVs. The correlation matrix between the two sets produced three canonical correlations with the values of 0.45, 0.32, and 0.10. As also shown in Table 16, the correlation among the IVs or the DVs was minimal, therefore, the assumption regarding within-set multicollinearity is met.

The second step was the calculation of the Eigenvalues. The Eigenvalues according to Tabachnick & Fidell (2001, p. 201), redistribute the variance in the matrix into few composite variates rather than many individual variables and determine how many dimensions are needed to explain the correlation between the two sets. As shown in Table 17, the SPSS procedure calculates the Eigenvalues and determines that two dimensions are needed for the analysis to explain the correlation between the two sets.

Table 17

Question 3 Canonical Correlation Model Summary

Dimension	Cronbach's Alpha	Variance Accounted For	
		Eigenvalues	% of Variance
1	0.499	1.775	22.18
2	0.301	1.357	16.96
Total	0.778*	3.132	39.15

Note. * Total Cronbach's alpha is based on the total Eigenvalues.

As a rule, the Eigenvalue for a dimension should be larger than 1, which is maintained in the first 2 dimensions. If the Eigenvalue is less than 1, the Cronbach's alpha would be negative (Tabachnick & Fidell, 2001). As shown in Table 17, the two-

dimensional solution accounted for 39.15% of the variance at a Cronbach's alpha of 78% reliability.

The third step was to test whether one or a set of canonical correlation differs from zero. The significance of one or more canonical correlation is evaluated as a chi-square variable as shown in Table 18. For the first correlation, chi-square equaled 79.2 with 15 degrees of freedom and over all effect (1-Wilks lambda) equaled 30%, was significant at $p < .01$. The result indicated that there was significant variability between the set of predictor variables and the set of dependent variables. This means that there was a reliable relationship between higher levels of education when combined with age, gender, race, and industry and higher levels of sales, number of employees, and longevity.

Table 18

Question 3 Test of Remaining Canonical Correlation are Zero

Dimension	Wilk's	Chi-Sq	df	Sig.
1	0.707	79.21	15	0.000
2	0.890	26.71	8	0.001
3	0.990	2.31	3	0.511

$p < .05$.

For the second correlation, chi-square equaled 26.7 with 8 degrees of freedom and over all effect that equals 11% is significant at $p < .05$. This result indicated that there was still significant overlap between the two sets of variables after the first pair of

canonical variates was removed. The third canonical correlation was not statistically significant, therefore, equals zero.

The fourth step in canonical correlation was the canonical coefficients. Two sets of canonical coefficients are required for each canonical correlation, one set to combine the IVs and the other to combine the DVs. Table 19 shows the canonical correlation coefficients for both sets.

Table 19

Question 3 Standardized Canonical Coefficients

Variable Sets	Function 1	Function 2
Set 1: Independent Variables		
Education level	0.26	-0.53
Owner age	-0.81	0.19
Gender	-0.49	-0.31
Race	-0.22	-0.52
Industry	-0.23	-0.37
Set 2: Dependent Variables		
Sales	0.19	0.44
Employees	-0.94	0.36
Longevity	0.49	0.65

The correlation coefficients were then used to weight the standardized scores and create loading matrices of the correlation between the variables and the canonical coefficients in order to interpret the canonical variates. The canonical loading matrices for both sets are presented in Table 20.

As mentioned earlier, because the first two canonical correlations were found to be significant, only the first and second canonical variate pairs were

considered. The canonical loading matrices showed the amount of variance extracted from the variables by its own canonical variates. The extracted variance was calculated by adding the squared values of the canonical pairs in each column and divided the total by the number of variables in each set as shown in Table 20.

Table 20

Canonical Loading Matrix of Question 3 Independent and Dependent Variables

Variable Sets	Canonical Variates Pairs	
	First	Second
Set 1: Independent Variable		
Education level	0.19	0.65
Owner age	-0.80	0.27
Gender	-0.53	-0.26
Race	-0.11	-0.62
Industry	-0.09	-0.54
Set 2: Dependent Variables		
Sales	0.07	0.67
Employees	-0.83	0.55
Longevity	0.41	0.79

From Table 20, the first canonical pair of the IVs extracted 20% of the variance and the second canonical pair extracted 25% of the variance. In summing, the two pairs extracted 45% of variance in educational level when associated with age, gender, race and industry. For the second set, the first canonical variate of the DVs extracted 29% of the variance and the second canonical pair extracted 45% of the variance. Together the

two canonical variates extracted 74% of the variance in sales, number of employees and longevity.

Often, however, one is interested in knowing how much variance the canonical variates from the IVs extract from the DVs, and vice versa. In canonical correlation, this variance is called redundancy. For a canonical variate, the redundancy is the percent it extracts from its own set of variables times the squared canonical correlation for the pair. The redundancy analysis for both sets is shown in Table 21.

Table 21

Redundancy Analysis of Question 3 Independent and Dependent Variables

Variable Sets	Variance Explained by Own Set		Variance Explained by Opposite Set	
	First Pair	Second Pair	First Pair	Second Pair
Set 1 (IVs)	0.20	0.25	0.04	0.03
Set 2 (DV's)	0.29	0.45	0.06	0.05

The first canonical variate of the IVs extracted 6% of the variance in the DVs, and the second canonical variate extracted 5% of the variance. Together, the two variates extracted 11% of the variance in business success. For the DVs, the first and second canonical variates extracted 4% and 3% of variance in IVs. Together, they extracted 7% of variance in educational level and the demographic variables.

As shown in Table 21, the canonical variates of both, the IVs and the DVs, explained small proportions of the opposite set variance despite the fact that the first two canonical correlations between the two set were significant. The literature indicated that a relatively strong canonical correlation might be obtained between two linear functions, even though these linear functions may not extract significant portions of variance from their opposite sets (Thompson, 1984). Further, research suggested that procedures that maximize correlation do not necessarily maximize pairs of canonical variates (Tabathnick and Fidell, 1999).

The following section summarizes the previous steps for the canonical correlation analysis between set one; educational level, age, gender, race, and industry and set two - sales, number of employees, and longevity. The summary is presented in Table 22.

Question 3 Summary of Results

Canonical correlation was performed between a set of educational background variables and a set of business success variables using SPSS. The educational background set included educational level, age, gender, race, and industry. The business success set included sales, number of employees, and longevity. Both the direction of correlations in the loading matrices and the direction of scales and measurements are considered when interpreting the canonical variates.

To improve linearity between variables and normality of their distribution, an alternating least square optimal scaling (ALSOS) procedure was applied to the variables in both sets. No within-set multivariate outliers were identified, and assumptions regarding within-set multicollinearity were met.

Table 22

Correlations Coefficients, Percent of Variance, Redundancies and Canonical Correlation of Business Success by Educational Level, Age, Gender, Ethnicity, and Industry

Variable Set	First Canonical Variate		Second Canonical Variate	
	Correlation	Coefficient	Correlation	Coefficient
Set 1: Ind. Variables				
Education level	0.19	0.26	0.65	-0.53
Owner age	-0.80	-0.81	0.27	0.19
Gender	-0.53	-0.49	-0.26	-0.31
Race	-0.11	-0.22	-0.62	-0.52
Industry	-0.09	-0.23	-0.54	-0.37
% of variance	0.20		0.25	Total = 0.45
Redundancy	0.04		0.03	Total = 0.07
Set 2: Dep. Variables				
Sales	0.07	0.19	0.67	0.44
Employees	-0.83	-0.94	0.55	0.36
Longevity	0.41	0.49	0.79	0.65
% of variance	0.29		0.45	Total = 0.74
Redundancy	0.06		0.05	Total = 0.11
Canonical Correlation	0.45		0.32	

The first canonical correlation was .45 (21% overlapping variance); the second was .32 (10% overlapping variance). The remaining canonical correlation was effectively zero. With all three canonical correlations included, chi-square (15) = 79.21, $p < .001$, and with the first canonical correlation removed, chi-square (8) = 26.71, $p < .001$.

Subsequent chi-square was not statistically significant. The first two canonical variates, therefore, accounted for the significant relationships between the two sets of variables.

Data on the first two pairs of canonical variates appear in Table 22. Shown in the table are correlations between the variables and the canonical variates, standardized canonical variates coefficients, within-set variance accounted for by the canonical variates (percent of variance), redundancies, and canonical correlations. Total percent of variance and total redundancy indicate that the first pair of canonical variates was minimally related, but the second pair was moderately related.

With a cutoff correlation of 0.2 as recommended by Kerlinger (1985, p. 189), the variables in the educational level set that were correlated with the first canonical variate were owner age and owner gender. Among the business success variables, number of employees and longevity were correlated with the first canonical variate. The first pair of the canonical variates indicated that a combination of low scores in educational level (.19), low scores in owners age (-.80), and low scores in gender (-.53), are associated with low scores in number of employees (-.83), and moderate score in longevity (.41).

The second canonical variate in the educational level set was composed of educational level, owner age, gender, and industry, while the corresponding canonical variate from the business success set was composed of sales, number of employees, and longevity. The second pair of canonical variates indicated that high scores in levels of education (.65), moderate score in owners age (.27), low scores in gender (-.26), low scores in ethnicity (-.62), and low scores in industry (-.54) were associated with high scores in sales volume (.67), high scores in number of employees (.55), and high scores

in longevity (.79). Taken as a pair, these variates suggest that a combination of high scores in educational level, low scores in age and gender are associated with high scores in sales, number of employees, and longevity.

As indicated by the canonical correlation analysis, the combination of educational level, age, gender, and industry showed significant correlations with sales, number of employees and longevity. Therefore, the null hypothesis that there was no relation between owner educational level when combined with age, gender, ethnicity and industry, and business success was rejected.

Research Question 4: Relation between Educational Major when Associated with Age, Gender, Race, and Industry and Small Business Success

The fourth purpose of this study was to investigate whether or not a relationship existed between the founder's educational major when associated with age, gender, race and industry and small business success. All respondents were asked the same question pertaining to educational major, age, gender, race and industry.

Educational major was rated on a 5-point nominal scale where 1 equals arts & humanities, 2 equals natural sciences, 3 equals professional, 4 equals technology & information, and 5 equals no-major. Educational major frequencies and percentages are presented in Table 23.

Table 23

Educational Major Categories

Variable	Category	Frequency	Percentage
Educational Major	1 = Arts & Humanities	45	20 %
	2 = Natural Sciences	15	7 %
	3 = Professional	126	55 %
	4 = Technology & Information	32	14 %
	5 = No Major	10	4 %

As previously presented, age was categorized on a 5-point ordinal scale, gender was categorized on a 2-point nominal scale, ethnicity was categorized on a 2-point nominal scale, and industry was divided into four nominal categories. Similarly, as in purpose three, sales, number of employees, and longevity were categorized and rated on a 5-point ordinal scale where 1 equals the lowest level and 5 equals the highest level.

A canonical correlation analysis was used to determine whether a relationship existed between owners' educational major when associated with age, gender, race, and industry, and small business success. As well as in purpose three, purpose four was also investigating a relationship between a set of independent variables and a set of dependent variables. Optimal scaling for variable transformation was also used to improve linearity of relationship between variables and normality of their distribution. Consequently, the correlation between the two sets is as large as possible. The canonical correlation matrix between the two sets is shown in the following Table 24.

Table 24

Question 4 Correlation Matrix

Variable	Independent Variables					Dependent Variables		
	Edmaj	Owage	Gend	Race	Indust	Sale	Empl	Long
Edmaj	1.00	-.01	.22	-.13	.11	-.14	-.07	-.01
Owage	.01	1.00	.07	-.08	-.22	-.11	-.09	-.02
Gend	.22	.07	1.00	-.03	-.03	-.14	.02	.01
Ethnicity	-.13	-.08	-.03	1.00	.07	-.04	.11	-.09
Indust	.11	-.22	-.03	.07	1.00	-.22	-.31	-.20
Sales	-.14	-.11	-.14	-.04	-.22	1.00	.59	.18
Empl	-.07	-.09	-.02	.11	-.31	.59	1.00	.13
Long	-.01	-.02	.01	-.09	-.20	.18	.13	1.00

$p < 0.05$

As shown in Table 24, four correlation matrices are presented - correlation among the IVs, correlation among the DVs, and the two correlation matrices between the IVs and the DVs. The correlation of the two sets produced three canonical correlations with the values of .397, .249, and .136. The table also showed that the correlation among the IVs or the DVs is minimal, therefore, the assumption regarding within-set multicollinearity was met.

The Eigenvalues were calculated, and it was determined that two dimensions were needed to analyze and interpret the canonical correlation between the two sets. As shown

in Table 25, the two-dimensional solution accounted for 40.46% of the variance at a Cronbach's alpha of 79% reliability.

Table 25

Question 4 Canonical Correlation Model Summary

Dimension	Cronbach's Alpha	Variance Accounted For	
		Eigenvalues	% of Variance
1	0.531	1.868	23.35
2	0.308	1.369	17.11
Total	0.790*	3.237	40.46

Note. * Total Cronbach's alpha is based on the total Eigenvalues.

The third step was to test whether one or a set of canonical correlation differs from zero. The significance of one or more canonical correlation was evaluated as a chi-square variable as shown in Table 26

For the first correlation, chi-square equaled 56.53 with 15 degrees of freedom and over all effect (1-Wilks lambda) equaled 23%, was significant at $p < .05$. The result indicated that there was significant variability between the set of predictor variables and the set of dependent variables. This means that there was a reliable relationship between the first set of variables of educational major, age, gender, race, and industry and success measures of sales, number of employees, and longevity.

Table 26

Question 4 Test of Remaining Canonical Correlations are Zero

Dimension	Wilk's	Chi-Sq	df	Sig.
1	0.776	56.53	15	0.000
2	0.921	18.42	8	0.018
3	0.981	4.17	3	0.243

$p < .05$

For the second correlation, chi-square equaled 18.4 with 8 degrees of freedom and over all effect that equaled 8% was significant at $p < .05$. This result indicated that there was a significant correlation overlap between the two sets after the first pair of canonical variants was removed. The third canonical correlation was not significant, therefore, equaled zero.

The next step in canonical correlation was the canonical coefficients. Two sets of coefficients are required for every significant canonical correlation, one set to combine the IVs and the other to combine the DVs. Table 27 shows the canonical correlation coefficients for both sets.

Table 27

Question 4 Standardized Canonical Coefficients

Variable Sets	Function 1	Function 2
Set 1: Independent Variables		
Education major	0.06	-0.39
Owner age	-0.45	-0.20
Gender	-0.08	-0.53
Race	0.13	-0.74
Industry	-0.98	0.11
Set 2: Dependent Variables		
Sales	0.21	1.19
Employees	-0.75	-0.95
Longevity	0.35	0.06

The correlation coefficients were then used to weight the standardized scores and create loading matrices of the correlation between the variables and the canonical coefficients in order to interpret the canonical variates. The loading matrix is presented in the following Table 28.

As discussed earlier, because the first two canonical correlations were found to be significant, only the first and second canonical variate pairs were considered. The canonical loading matrices showed the amount of variance extracted from the variables by its own canonical variates. The extracted variance was calculated by adding the squared values of the canonical pairs in each column and divided by the number of variables in each set.

Table 28

Question 4 Canonical Correlation Loading Matrix

Variable Sets	Canonical Variates Pairs	
	First	Second
Set 1: Independent Variable		
Education major	-0.20	-0.40
Owner age	-0.24	-0.21
Gender	-0.01	-0.61
Race	0.11	-0.64
Industry	-0.88	0.08
Set 2: Dependent Variables		
Sales	0.71	0.64
Employees	0.92	-0.25
Longevity	0.48	0.14

From Table 28, the first canonical variate of the IVs extract 18% of the variance and the second canonical pair extracts 20% of the variance. In summing, the two pairs extract 38% of variance in educational major when associated with age, gender, race, and industry. For the second set, the first canonical variate of the DVs extract 53% of the variance and the second canonical pair extracts 16% of the variance. Together the two canonical variates extract 69% of the variance in sales, number of employees and longevity.

Often, however, one is interested in knowing how much variance the canonical variates from the IVs extract from the DVs, and vice versa. In canonical correlation, this variance is called redundancy. For a canonical variate, the

redundancy is the percent it extracts from its own set of variables times the squared canonical correlation for the pair. The redundancy analysis for both sets is presented in Table 29.

Table 29

Redundancy Analysis of Question 4 Independent and Dependent Variables

Variable Sets	Variance Explained by Own Set		Variance Explained by Opposite Set	
	First Pair	Second Pair	First Pair	Second Pair
Set 1 (IVs)	0.18	0.20	0.03	0.01
Set 2 (DVs)	0.53	0.16	0.08	0.01

The first canonical variate of the IVs extracted 8% of the variance in DVs, and the second canonical variate extracted 1% of the variance. Together, the two variates extracted 9% of the variance in business success. For the DVs, the first and second canonical variates extracted 3% and 1% of variance in IVs. Together, they extracted 4% of variance in educational level and the demographic variables.

As shown in Table 29, the canonical variates of both, the IVs and the DVs, explained small proportions of variance of the opposite set despite the fact that the first two canonical correlations between the two sets were significant. The literature indicated that a relatively strong canonical correlation might be obtained between two linear functions, even though these linear functions may not extract significant portions of

variance from their opposite sets (Thompson, 1984). Further, research suggested that procedures that maximize correlation do not necessarily maximize pairs of canonical variates (Tabachnik & Fidell, 1999).

The following section presents a summary of the previous steps of the canonical correlation analysis for the relation between set one, educational major, age, gender, race and industry; and set two, sales, employees, and longevity. The summary of canonical analysis is presented in Table 30.

Table 30

Correlation Coefficients, Percent of Variance, Redundancies, and Canonical Correlation of Business Success by Educational Major, Age, Gender, Ethnicity, and Industry

Variable set	First Canonical Variate		Second Canonical Variate	
	Correlation	Coefficient	Correlation	Coefficient
Set 1: Ind. variables				
Education major	0.20	-0.06	-0.40	-0.39
Owner age	-0.01	-0.45	-0.05	-0.20
Gender	0.04	-0.08	-0.15	-0.53
Ethnicity	0.04	0.13	-0.16	-0.74
Industry	-0.98	-0.23	0.11	-0.38
% of variance	0.18		0.20	Total = 0.38
Redundancy	0.08		0.01	Total = 0.09
Set 2: Dep. variables				
Sales	0.71	0.21	0.64	1.19
Employees	0.92	0.75	-0.25	-0.95
Longevity	0.49	0.39	0.14	0.06
% of variance	0.53		0.16	Total = 0.69
Redundancy	0.03		0.01	Total = 0.04
Canonical Correlation	0.40		0.25	

Question 4 Summary of Results

Canonical correlation was performed between a set of independent variables and a set of dependent variables using SPSS12. The first set included educational major, age, gender, ethnicity, and industry. The business success set included sales, number of employees, and longevity. Both the direction of correlations in the loading matrices and the direction of scales and measurements are considered when interpreting the canonical variates.

To improve linearity between variables and normality of their distribution, the ALSOS procedure was applied to the variables in both sets. No within-set multivariate outliers were identified, and assumptions regarding within-set multicollinearity were met.

The first canonical correlation was .40 (16% overlapping variance); the second was .25 (6% overlapping variance). The remaining canonical correlation was effectively zero. With all three canonical correlations included, chi-square (15) = 56.53, $p < .01$, and with the first canonical correlation removed, chi-square (8) = 18.42, $p < .05$. Subsequent chi-square was not significant. The first two canonical variates, therefore, accounted for the significant relationships between the two sets of variables.

As shown in Table 30, the total percent of variance and total redundancy indicated that the first pair of canonical variates was moderately related, but the second pair was minimally related. With a cutoff correlation of 0.2 as recommended by Kerlinger (1985, p. 189), the independent variables in set one that were correlated with the first canonical variate were educational major and industry. Among the business success variables, sales, number of employees and longevity correlated with the first canonical variate.

The first canonical variates indicated that the combination of with moderately low scores in educational major (.20), very low scores in industry (-.98), are associated with high scores in levels of sales (.71), high scores in number of employees (.92), and moderate scores in longevity (.49).

The second canonical variate in set one was composed of only the educational major while the corresponding canonical variate from the business success set was composed of sales, and number of employees. The second canonical variates indicated that those with low scores in educational majors (-.40), are associated with high scores in sales volume (.64), and low scores in number of employees (-.25). Taken as a pair, these variates suggested that a combination of low scores in education major and industry are associated with high scores in sales and low scores in longevity.

As indicated by the canonical correlation analysis, the combination of educational major, age, gender, ethnicity and industry showed significant correlation with sales volume, number of employees, and longevity. Therefore, the null hypothesis that there was no relation between owner educational major when combined with age, gender, ethnicity and industry, and business success was rejected.

Findings of Other Related Questions

The participants in this study were asked to respond to five statements in order to determine their opinion of the influence of attending or obtaining a college degree on business success. These statements concerned (a) business skills and knowledge, (b) operating the business, (c) identifying problems, (d) making necessary changes, and (e)

enhancing success and growth. Results of the responses to these statements are explained below.

In this section of the survey, the respondents were asked to mark the item that best described their opinion concerning the influence of college education on business success. Five items were included in each statement: *strongly agree, agree, neither, disagree nor agree, strongly disagree*. The results of response frequencies are presented in Table 31.

Table 31

Owners' Opinion Response Frequencies of College Education Influence on Business Success

Response	Skills & knowledge	Operating business	Identify problems	Necessary changes	Success & growth
Strongly agree	85	74	46	37	107
Agree	86	84	73	80	92
Neither	36	50	79	84	19
Disagree	14	12	22	19	6
Strongly disagree	7	8	8	8	4

$n = 228$.

As demonstrated in Table 31, 171 respondents (75%) agreed that college education enhanced their business skills and knowledge, and 158 respondents (69%)

agreed that attending college helped them run the business. While 119 respondents (52%) agreed that college education helped them identify business problems, 117 respondents (51%) agreed that college education helped them make the necessary changes. Furthermore, 199 respondents (87%) agreed that college education gave them a better chance for success and growth.

An independent sample *t*-test was conducted to determine whether significant differences existed between college graduates and non-college graduates in their opinion of college education influence on business success. The sample was divided into two groups where 1 equals college graduates and 2 equals non-college graduates. The opinion statements were rated on a 5-point Likert scale where 1 equals strongly agree, 2 equals agree, 3 equals neither, 4 equals disagree, and 5 equals strongly disagree. The *t*-test group statistics are shown in Table 32.

As presented in Table 32, the means of college graduates and non-college graduates pertaining to owners' opinion about college education influence on business success showed small differences. In order to determine whether those differences in means are significant, an independent sample *t*-test was used.

Table 32

Independent Sample t-test Group Statistics of College Influence by Owners' Opinion

Statement	1 = Degree 2 = No degree		N	Mean	Std. Deviation	Std. Error Mean
Skills & knowledge	1	75		2.52	1.070	0.124
	2	153		1.75	0.907	0.073
Operating business	1	75		2.77	0.981	0.113
	2	153		1.78	0.890	0.072
Identify problems	1	75		3.03	0.885	0.102
	2	153		2.16	0.974	0.079
Necessary changes	1	75		3.05	0.868	0.100
	2	153		2.20	0.904	0.073
Success & growth	1	75		2.16	0.973	0.112
	2	153		1.50	0.708	0.057

The independent sample *t*-test includes, Levene's Test for Equality of Variances, and the test for the homogeneity of variance assumption (see Table 33). As showed in the table, the *F* values of 4.57, 4.48, and 4.92 for skills & knowledge, identify problems, and success & growth respectively, were found to be significant at 0.05 level of significance. This indicated that the means are heterogeneous for these statements, and the *t*-test based on equal variances not assumed was used.

On the other hand, the *F* values of .56 and 4.92 for operating the business and necessary changes respectively were found to be significant at the .05 level of

significance. This indicated that the means for these statements were homogeneous, and the *t*-test based on equal variances assumed was used.

As presented in Table 33, the *t*-value of all the statements was found to be significant at the .05 level of significance. It can be concluded that the difference between means of college graduates and non-graduates pertaining to the influence of college education on business success is significant.

Table 33

Independent Sample t-test of Education Influence by Owners' Opinion

Variable		Levene's Test For Equality of Variances		<i>t</i> -test for Equality of Means						
		<i>F</i>	Sig.	<i>t</i>	<i>df</i>	Sig. (2-tailed)	Mean Differ- ence	Std. Error Differ- ence	95% Confidence Interval of the Difference	
									Lower	Upper
Skills & Knowledge	Equal var. assumed	4.57	.034	5.71	226	.000	.775	.136	.51	1.04
	Equal var. not assumed			5.39	127.61	.000	.775	.144	.49	1.06
Operating Business	Equal var. assumed	.56	.456	7.67	226	.000	.996	.130	.74	1.25
	Equal var. not assumed			7.42	135.13	.000	.996	.134	.73	1.26
Identify Problems	Equal var. assumed	4.48	.035	6.52	226	.000	.870	.133	.61	1.13
	Equal var. not assumed			6.74	160.46	.000	.870	.129	.62	1.13
Necessary Changes	Equal var. assumed	2.38	.124	6.82	226	.000	.857	.126	.61	1.11
	Equal var. not assumed			6.91	152.51	.000	.857	.124	.61	1.10
Success & Growth	Equal var. assumed	4.92	.028	5.79	226	.000	.657	.113	.43	.88
	Equal var. not assumed			5.21	113.69	.000	.657	.126	.41	.91

 $p < .05$

CHAPTER 5
SUMMARY, DISCUSSION, CONCLUSIONS,
AND RECOMMENDATIONS

All aspects of this study are summarized in this chapter: the research design, the implementation of the study, the findings concerning relationships between the educational background of business owners and small business success in Texas. The findings are discussed as they relate to the purposes of this study and to whether they are consistent with previous research studies on similar subjects. The answers to the research questions of this study are explained and discussed. The conclusions and recommendations for future research are presented along with possible applications for the findings in similar studies of small business success in different populations.

Summary

Interest in small business has witnessed significant growth in recent years. Such interest was due to the yearly increase of small business formations and their ability of new jobs creations. Along with the increased number of small business formation, the number of small business failures also increased. Many previous researchers sought to examine the factors influencing small business success. Factors normally considered are characteristics or traits of successful business people and people's perceptions of business success. In addition, several studies examined different types of businesses, gender differences, and comparison of managers, entrepreneurs, small business owners. The

review of these studies produced a common theme: Although these were mixed and sometime contradicting results, the marginalization of college education's influence on small business success. The literature supported the notion that American business owners today are younger than in years past, more educated and less experienced and higher levels of education increased the likelihood of business survival and growth. Additionally, it is essential to understand the educational background of business creators to foster better understanding of business success and growth.

This study was designed to describe the relationship between small business success and the educational background of business owners. Small business success was defined in this study as sales volume, number of employees, and longevity. Educational background was defined as educational level and educational major at the time the data was collected.

The population surveyed included 1100 businesses from Dallas, Denton, and Tarrant counties in Texas. Only those with 20 or fewer employees, \$3,000,000 or less in sales, and 5 or more years old were surveyed. The survey instrument was developed by identifying and using valid items from instruments used in similar research. It should be noted that the sample was collected from businesses that are considered successful according to the parameters used to define success adopted in this study (Ibrahim & Goodwin, 1986).

The statistical analyses used to determine the impact of owners' educational background on small business success were Pearson's correlation, Spearman's correlation, independent sample *t*-test, one-way analysis of variance, and canonical

correlation. The level of significance was set at 0.05 for all of the statistical tests. Sales volume, number of employees, and longevity, as well as educational level were measured on a 5-point ordinal scale. While educational major was measured on 5-point nominal scale, business type was measured on a 4-point nominal scale. Gender and ethnicity were measured on a 2-point nominal scale.

When educational level and educational major were used as the only predictors of business success, Pearson's correlation showed a significant relationship between owners' years of formal education and sales volume at the 0.05 level. A significant relationship was also found between sales, number of employees, and longevity. Pearson's correlation also showed no significant relationship between owners' educational major and business success at the 0.05 level. In addition, one-way analysis of variance and the independent sample *t*-test showed no significant relationship between owners' educational major and small business success at the 0.05 level.

A canonical correlation was used to determine the relationship between the independent variables set of educational level, age, gender, ethnicity, and business type and the dependent variables set of sales volume, number of employees and longevity. For this purpose, the alternating least square optimal scaling (ALSOS) transformation procedure was used in order to improve the linearity and distribution normality of the variables. Two significant canonical correlations, which were 0.45 and 0.32, were found between the two sets at the 0.05 level.

The canonical correlation was also used to determine the relationship between the independent variables set of educational major, age, gender and business type and the

dependent variables set of sales volume, number of employees, and longevity. The ALSOS transformation procedure was also used for this purpose. Two significant canonical correlations, which were 0.40 and 0.25, were found between the two sets at the 0.05 level.

Lastly, the independent sample *t*-test was used to examine the difference in mean scores of the opinion responses regarding the influence of college education on business success between owners who graduated from college, and those who did not. The opinions statements were rated on a 5-point Likert scale ranging from 1 that equals strongly agree to 5 that equals strongly disagree. The results of the independent sample *t*-test indicated that significant differences existed between the means of responses of owners' who were college graduates and those of non-graduates regarding the influence and importance of college education to business success at the 0.05 level.

Discussion

This study has presented and reviewed the research related to the relation between the educational background of business owners and small business success. The review included the literature on entrepreneurship and characteristics of successful entrepreneurs, small business growth and success, and educational background relation and influence on successful businesses.

The positive relationship found in this study between the educational background of small business owners and their business success is consistent with the findings in similar studies. It has generally been found that the relationship between the owners'

educational level and business success is essential. The argument is that education has two critical roles; (1) it plays a fundamental role in business creation (Gartner, 1988; Sletten & Hulaas, 1998), and (2) it provides for the continuing need for knowledge due to the rapid growth of technology and heavy competition (Brockaus & Hoewitz, 1986; Scott, et al., 1998; and Cooper, 1992).

In the literature, business founders/owners were found to be more educated than the general public (Davis, 1963; Cooper & Dunkelberg, 1987, Robinson & Sexton, 1994; Kilpatrick & Crowley, 1999; Douglas, 1976; Foley & Griffith, 1998; and Scott, et al., 1998), and their higher levels of education increased their chance for business growth and success (Robinson & Sexton, 1994; Kiesner, 1984; and Vesper, 1990). For instance, Dolinsky, et al., (1993) noted that the likelihood of survival and success after entering into the self-employment is uniformly greater at increased level of educational attainment.

The findings of this study as presented in Table 9, showed that business owners with more years of formal education were significantly correlated with higher levels of sales, which enhances their chance of success and survival.

Traditionally, educational major is an important factor in determining a person's career aspirations. The most likely to become self-employed according to Rosa & McAlaine (1991), are those trained in professions where self-employment is the norm (e.g., legal, medical), or being involved in a family business that provide the necessary knowledge and mentoring to run the business successfully (Boyed, 1998). Today's business owners are younger, better educated (e.g., Sletten & Hulaas, 1998), less

experienced (e.g., Brockhaus & Horwitz, 1986) and more likely to start their own business than the less educated people (e.g., Robinson & Sexton, 1994). The findings of this study as presented in Table 6, showed that 65% of the sample participants were 35 years of age or younger, 92% attended college, and 68% attained a college degree.

It is critical to investigate the educational background of business owners in order to understand the relation between business growth and success and specific types of education. The literature showed that several studies attempted to examine the relationship between educational major and business success. A study of successful entrepreneurs by Davis (1963), showed a relation between higher levels of education and starting a business, and the value of certain types of education in operating the business.

In his study of business practitioners, Kiesner (1984), found that more educated business owners supported the positive value of their educational background to their business success. Shetton and Hulaas (1998) study of entrepreneurs found that among other factors, business ideas are closely related to educational background. The findings of this study showed a significant and positive relationship between owner's educational level (years of formal education) and business success (sales volume). The findings as presented in Table 32 showed that business owners significantly agreed to the importance and the benefit of college education to starting, operating and managing their businesses.

Few other studies that examined the relationship between educational major and business success (e.g., Robinson & Sexton, 1994; Ibrahim & Goodwin, 1986; and Robidox & Ganier, 1973) showed that higher levels of education are closely related to success but failed to show the significant influence of specific types of education on

business success. When educational major was used as the only predictor of business success, the findings of this study did not show a significant relationship between the owners' educational major and business success at the significant level of 0.05.

As supported by the literature, Kiesner (1984) and Robinson & Sexton (1994) suggested that their statistical findings of no relationship between education major and business success were not statistically significant but have the potential to show stronger relation. They recommended further testing of the relation by using a larger sample and a more realistic measure of business success to provide conclusive evidence that college major is related to success in small business. The findings of this study suggested that the relation between educational major and business success might be significant upon using a larger sample or using a better describer of business success such as profit, revenue, or tax returns.

As discussed earlier, owners' educational level is an important correlate of small business growth and success. Other factors such as age, gender, ethnicity, and business type must be considered when examining the relation between the education level of business owners and business success. The findings of this study as presented in Table 22 of the relationship between educational level when combined with age, gender, ethnicity, and business type and small business success showed two significant canonical correlations, which were 0.45 and 0.32, at the 0.05 level.

The first correlation showed that owners with low scores in age, low scores in gender, and with low scores in educational levels are associated with low scores in number of employees and moderate scores in longevity. This supports studies by

Brockhaus & Horwitz (1986), Sletten & Hulaas (1998), and Dolinsky, et al., (1993)

which showed that in today's high tech economy, and heavy competition, higher levels of education is very essential to business survival and the success of young and less experienced entrepreneurs.

The second canonical correlation confirmed that business owners with high scores in levels of education, moderate scores in age, low scores in gender, low scores in ethnic background, and low scores in industry are associated with high scores in levels of sales, number of employees, and more years of success. Both Correlations suggested that high scores in education levels are associated with high scores in business success.

In addition, educational major plays an important role in career aspirations and the type of business to start. In support, Brockhaus & Howrutz's (1986) and Hisrich's (1986) studies showed that different characteristics of business founders including educational background are associated with what kind of business to start. Thus, it is important to examine the relation between educational background when combined with age, gender, ethnicity, and business type and small business success.

The findings of this study showed two significant relationships between education major and business success, which were 0.40 and 0.25, at the 0.05 level (see Table 30). The first significant relation showed that owners with low scores in educational major, with low scores in industry are associated with high scores in levels of sales, number of employees, and longevity. In support, Brockhuas & Howrutz's (1986) study suggested that educational backgrounds associated with a service business might be different from those associated with a manufacturing business. Hisrich's (1986) and Sletten & Hulaas's

(1998) studies of female and male entrepreneurs showed a difference between men and women in educational backgrounds and subsequently a difference in the nature of business type. Vesper (1990) and Robinson & Sexton (1994) also concluded that entrepreneurs with a good educational background tend to be more successful than those with less favorable educational background.

The findings showed a second significant relationship between educational major and business success at the 0.05 level. It showed that owners with low scores in educational major are associated with moderate scores in sales volume, but low scores in number of employee and longevity. Both canonical correlations suggest that low score in educational major are associated with moderate sales but low scores in employment and longevity. Such significant relation could be argued that the owner's educational major maybe not related to the nature of the business.

The absence of a sound educational background related to the business type may ultimately lead to the closure or failure of the business. The 1986 study of causes of business failures by the National Federation of Independent Businesses (NFIB) surveyed 5000 businesses and found that 40% of owners had only a high school diploma and 38% had never taken a business course. In support to the NFIB report, Bruno & Leidecker's (1988) longitudinal study of business performance, and weaknesses and found that 30% of business failures were caused by management, and the founder's inability to recognize their own strength and act accordingly.

It can be also argued that the low correlation scores of college major to sales and number of employees is due to the recent economic difficulties and scarcity of salaried

jobs, which forced many individuals to start a business in a different field than their educational background and with no experience. As result, owners may achieve short-term success (high sales, low employment, low longevity) but eventually competition will force them to close out the business. In support, the literature demonstrated that business owners with good educational background are more successful than those with less favorable education (Scott, et al., 1998; Vesper, 1990). Furthermore, Brockhaus & Horwitz (1986) suggested that the most likely entrepreneurs to fail would be those with experience but no education, and the second most likely to fail would be those with education but no experience.

Finally, opinions of business owners are critical in understanding the nature of there business and the needs and uses of their educational background. Davis (1963) reported that business owners attested to the value they had found in their own education and to the specific help certain types of education had given them in starting and operating their businesses. At the same time, he reported that lack of knowledge in accounting, bookkeeping, general business, and advanced education put the owners at a disadvantage in their business operation (p. 60). Meanwhile, Kiesner (1984) showed that even though a positive relationship was found between educational background and business success, owners agreed that colleges need to provide more specialized knowledge needed in daily operation of the business.

The findings of this study showed a significant difference regarding the influence and importance of college education to business success between the opinions of business owners who graduated from college and those who did not. The differences were in

business skills and knowledge, operating the business, identifying problems, making necessary changes, and enhancing their chance of growth and success. However, the findings in this study are limited because out of 1036 subjects who were eligible and agreed to participate, only 236 (22%) usable surveys were returned.

Conclusions

The conclusions reached as a result of this study are:

1. An important conclusion of this study is that the often-argued relationship between college education in general, and education in business in specific, and small business success continues to be critical. Such importance is evident in the continuing need for learning to cope with rapid technological advances, competition, and the changing global economy.

2. Years of formal education and age are more often linked to the success of small business than are lack of degree and being young. Therefore, entrepreneurs and small business owners are more likely to succeed and sustain a profitable business if they have a college degree and are older, which implies business experience.

3. Education major appears not to be directly linked to small business success, where owners with degrees that appear not to be directly related could and do sustain a profitable business. In such cases the owner's education, business and technical skills, and experience, based on reports by the study participants, provide the ground for the owner to learn, adapt, and maintain a successful business.

4. Data on gender and ethnicity from the study indicated that females, African-American, and Hispanics are apparently underrepresented as small business owners in the area.

5. Although the design of this study applied acceptable and standard procedures expected of survey research, the results indicate that this design was not sufficient to describe the business owner's insight to the value of education in general, or specific education majors, in relation to how these did or did not contribute to the owners decision making that lead to the success of the business.

6. Because of its focus on education, this design did not consider the resultant learning and provide a description of experiential or incidental learning, of mentoring resulting in learning, or of developmental courses that the owner may have engaged in before starting the business or during the start-up or operation of the business. With the completion of the study, the data suggests all of these appear to be critical to describe the broader impact of college education and its outcome, learning, that may contribute to business success.

7. Additionally given insight from the study, the researcher concludes that a study of education in this context without some study of specific learning by the business owner can only provide a limited understanding of educational and learning factors that contribute to business success.

Recommendations

Five recommendations are made based on the findings and conclusions of this study.

1. As the findings of this limited study indicated a positive relation exists between educational level and business success in a developed society, it is suggested that additional studies should be done in a developing society or a different culture to see if a positive relationship exists between educational level and business success.

2. As the findings of this limited study indicated the lack a linear correlation or the existence of a negative correlation between educational major and small business success suggests that additional studies should be done on larger samples to better differentiate between specific types of educational majors as they relate to small business success.

3. Due to the small number of female participants, the findings of this study did not show conclusive evidence of the relation between educational background when combined with gender and business success. It is suggested that additional studies should be done to test if the relationship between educational background and business success differs among males and females.

4. Due to the underrepresentation of minority participants, the findings of this study did not show conclusive evidence of a relationship between educational background when combined with ethnicity. It is suggested that additional studies should be done to test if the relation between educational background and business success differ among different ethnic groups.

5. Because the findings of this study were reached upon investigating a sample of successful businesses, it is suggested that additional studies should be done on samples of discontinued or failed businesses to test if the lack of a solid educational background was one of the major reasons for the business failure.

APPENDIX A
COVER LETTER

Dear Survey Participant

Thank you for taking the time to help me in a research project as part of my doctoral education at the University of North Texas. The attached survey is being used to collect information regarding 1) your personal and educational background and 2) the influence of college educational background on small business success. This information will provide preliminary data regarding the impact of college education on small business success and growth, and may help to better prepare future students for success in the business world.

Your participation is voluntary, and there are no right or wrong answers. Your response is very important, and may help to better understand the impact of college education on small success. The data collected will be used strictly for research purposes in completion of my doctoral project under the guidance of Dr. Ron Newsom, Professor and project advisor. You may withdraw your participation at any time.

Your response will be anonymous and will be held in strictest confidence. No data will be linked to personal information, and after summary, the individual responses will be properly destroyed. The survey consists of two and half pages and will take approximately 20 minutes to complete. Your completion and return of this survey will be greatly appreciated.

Please complete the survey within 5 business days and return it in the self-stamped envelope. If you have a question, please feel free to contact me at 940-xxx-xxxx or Dr. Ron Newsom at 940-565-2045. You may keep this letter for your records.

If you are interested in receiving a summary of results, please indicate at the end of the survey by providing a return address. Thank you for your participation.

Sincerely,

M. Alzubeidi
Doctoral Student
University of North Texas
Denton, Texas

Dr. Ron Newsom
Dept of Counseling, Development & Higher Education
University of North Texas
Denton, Texas

APPENDIX B
PERMISION LETTERS

Mohammad Alzubeidi
University of North Texas
P. O. Box 307359
Denton, Texas 76203

February 15, 2004

Professor W. F. Kiesner

Dear Dr. Kiesner:

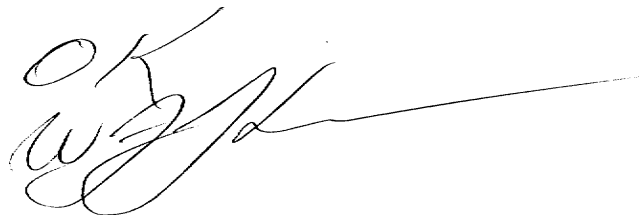
I am a doctoral student at the University of North Texas in the area of Higher Education Administration. My Doctoral research subject is THE RELATION BETWEEN COLLEGE EDUCATIONAL BACKGROUND AND SMALL BUSINESS SUCCESS. The study will involve a random sample of 1100 small businesses in Texas.

The purpose of this letter is to request your permission for the partial use of your 1984 research instrument titled SMALL BUSINESS QUESTIONNAIRE – OWNER/MANAGER SURVEY.

By this Correspondence, permission is sought to reproduce, and if necessary amend the questions according to the purpose of the study. Enclosed is a Self-stamped envelope for the permission letter.

Sincerely,

Mohammad Al-zubeidi
Doctoral Student
University of North Texas

A handwritten signature in black ink, appearing to be 'W. F. Kiesner', with the letters 'OK' written above it in a similar cursive style. The signature is written on a white background.

Mohammad Al-zubeidi
University of North Texas
P. O. Box 307359
Denton, Texas 76203

February 15, 2004

Professor E. Solymossy

Dear Dr. Solymossy:

I am a doctoral student at the University of North Texas in the area of Higher Education Administration. My Doctoral research subject is THE RELATION BETWEEN COLLEGE EDUCATIONAL BACKGROUND AND SMALL BUSINESS SUCCESS. The study will involve a random sample of 1100 small businesses in Texas.

The purpose of this letter is to request your permission for the partial use of your 1998 research instrument titled Dimensions and Patterns of Success: an Entrepreneurship Survey.

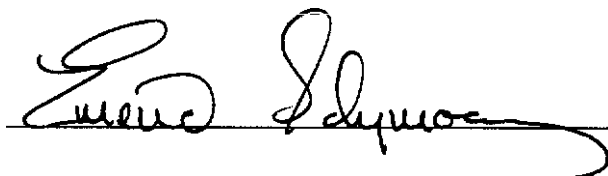
By this Correspondence, permission is sought to reproduce, and if necessary amend the questions according to the purpose of the study. Enclosed is a Self-stamped envelope for the permission letter.

Sincerely,

Mohammad Al-zubeidi
Doctoral Student
University of North Texas

I hereby grant Mohammad Al-Zubeidi permission to reproduce and use all or portions of the survey instrument and auxiliary information from my 1998 dissertation, titled: "Entrepreneurial Dimensions: The Relationship Of Individual, Venture, and Environmental Factors To Success." Said permission is granted based on appropriate citation and credits being reflected.

Feb 21, 2005
Dr. Emeric Solymossy
Assoc. Professor of Management Western Illinois University, Quad Cities

A handwritten signature in black ink, appearing to read "Emeric Solymossy", written over a horizontal line.

APPENDIX C
QUESTIONNAIRE

College Education and Business Success: an Entrepreneurial Survey

You have been selected to represent entrepreneurial small businesses in Texas. Thank you for taking the time to help in this research effort. The information collected in this survey is for understanding the relationship between educational background and business success. Please answer every item as it applies. You will remain completely anonymous. Your opinion, perception, and information matter and will assist to better understand the role of educational background in small business success in Texas.

Thank you for your help. Please return the questionnaire in the self-addressed postage paid envelope

Section One: Demographic Information

1. Your Age? _____ Your Sex? Male _____ Female _____

2. Marital Status? Single _____ Married _____ Divorced _____

3. What is your ethnic origin?
Caucasian _____ African American _____ Hispanic _____ Asian _____ Other (indicate) _____

4. What is your highest educational level?
High School or Less _____ Some College _____ Bachelor _____ Master _____ PhD _____

5. How many years of formal education have you completed before starting your business? _____

6. If attended or graduated from college, what area is your degree?
Agriculture _____ Computer _____ Law _____ Medical & Public Health _____
Business _____ Education _____ Liberal Arts _____ Social Science _____
Communications _____ Engineering _____ Natural Science _____ Other
(specify) _____

7. What was your major(s) _____, _____

Section Two: Business Information

8. Did you start this business? Yes___ No___ if No Specify_____
9. What age were you when you started or owned this business? _____
10. Is this your first business Yes___No___ If No Specify _____
11. What was the reason(s) behind starting your current business? (Check all that apply)
Economic necessity___ Work flexibility___ Independence___ Opportunity___
Other (specify) _____
12. What was your occupation before starting this business? _____
13. Is the business Single ownership___ Partnership___ Corporation___
14. If more than one owner, how many owners? ___What percentage do you own?___%
15. How were funds obtained to start your business? (Check all that apply)
Self___ Family ___ Bank loan ___ Gov. loan/grant___ Other (indicate) _____
16. From whom did you have most influence to start your business?
Parents___ Relatives___ Self___ Friends___ Other (indicate) _____
17. Type of industry/business that best describes your business?
- | | | |
|------------------------|----------------------------|-----------------------|
| Agriculture _____ | Mining _____ | Wholesale _____ |
| Consumer Service _____ | Professional Service _____ | Other (specify) _____ |
| Construction _____ | Retail _____ | _____ |
| Manufacturing _____ | Transportation _____ | _____ |

18. What kind of product or service does your business provide? _____

19. How do you describe the use of technology (e.g. computer, internet) in your daily operations?

Always_____ Often_____ Sometimes_____ Rarely_____ Never_____

20. How do you describe the use of technology (e.g. Computer, internet) in daily operations?

Very Important___ Important___ Fairly Important___ Not Important

Section Three: Education and Business

21. To what extent do you agree or disagree with the following statements:

I. Attending or obtaining a college degree enhanced my business skills and knowledge

Strongly agree___ Agree ___ Neither___ Disagree___ Strongly disagree___

II. Attending college before starting a business has been helpful in running my business

Strongly agree___ Agree ___ Neither___ Disagree___ Strongly disagree___

III. Attending or obtaining a college degree helped me identify problems in my business

Strongly agree___ Agree ___ Neither___ Disagree___ Strongly disagree___

IV. Attending or obtaining a college degree helped me make necessary changes in my business

Strongly agree___ Agree ___ Neither___ Disagree___ Strongly disagree___

V. Attending or obtaining a college degree gives the owner a better chance of success and growth

Strongly agree ___ Agree ___ Neither ___ Disagree ___ Strongly disagree ___

22. Before starting the business, what was your biggest problem(s)?

23. After starting the business, what was the problem that created the greatest difficulty for;

You _____

The Business _____

The Employees _____

24. When you were setting up your business:

What part of your education was most valuable? _____

What part of your education was lacking? _____

25. After you started your business:

What part of your education was most valuable? _____

What part of your education was lacking? _____

Section Four: Success and Growth Indicators

26. What year was this business started? _____

27. If you did not start this business, how long have you owned or managed this business? _____

28. How many people are employed (including your self) at the present? _____

29. How many people were employed (including self) in the following years in business?

1998_____ 1999_____ 2000_____ 2001_____ 2002_____

30. What was your approximate sale volume in the past year? _____

31. What was your approximate sale volume in each of the following years in business?

1998_____ 1999_____ 2000_____ 2001_____ 2002_____

32. How do describe your business success and growth when compared to similar businesses?

Very Successful_____ Successful_____ Fairly Successful_____ Not Successful_____

33. If you needed help or training for your business, please indicate in what area or areas

34. Is there anything that you feel is critical to better understand the success of your business that we did not address in this survey, if yes please identify:

If you would like a summary of the results, please provide below a return address:

REFERENCES

- Acs, J. Z. (1999). *Are small firms important: Their role and impact*. Norwell, Massachusetts: Kluwer Academic Publishers.
- Ashmore, M. C. (1986). Entrepreneurship education makes sense. *Vocational Education Journal*, *61*, 47-49.
- Ashmore, M. C. (1988). Entrepreneurship: Future directions. *Journal of Education for Business*, *63*, 149-152.
- Auster, E. (1988). Owner and organizational characteristics of black and white owned businesses. *American Journal of Economics and Sociology*, *47*(3), 331-344.
- Begley, T. (1995). Using founder status, age of firm, and company growth rate as the basis for distinguishing entrepreneurs from managers of smaller businesses. *Journal of Business Venturing*, *10*, 249-263.
- Begley, T., & Boyd, D. (1987). A comparison of entrepreneurs and managers of small business firms. *Journal of Management*, *13*(1), 99-108.
- Boyed, J. (1998). *Mentoring in family firms: A reflective analysis of senior executives' perceptions*. Unpublished doctoral dissertation, University of North Texas, Denton, TX.
- Brenner, C., Pringle, D. & Greenhouse, J. (1991, July). Perceived fulfillment of organizational employment versus entrepreneurship: Work values and career intentions of business college students. *Journal of Small Business Management*, *29*(3), 62-73.
- Brockhaus, R. H. (1982). The psychology of the entrepreneur. In C. Kent, D. Sexton, & K. Vesper, *Encyclopedia of entrepreneurship* (pp. 39-71). Englewood Cliffs, NJ: Prentice Hall, Inc.
- Brockhaus, R., & Horwitz, P. (1986). The psychology of the entrepreneur. In D. Sexton, & R. Smilor, *The art and science of entrepreneurship* (pp.25-48). Cambridge, MA: Ballinger Publishing Company,

- Brockhaus, H., & Nord, W. (1979). An exploration of factors affecting the entrepreneurial decision: Personal characteristics vs. environmental conditions. *Proceedings of the 39th Annual Meeting of the Academy of Management*, 364-368.
- Bruno, A. & Leidecker, J. (1988). Causes of new venture failure: 1960s vs. 1980s. *Business Horizons*, 31(6), 51-56.
- Butler, T. (1990). Strategic planning for the 1990s: An approach to entrepreneurship training. *NBEA Yearbook*, 28, 86-89.
- Bygrave, W. (1997). *The portable MBA in entrepreneurship*. New York, NY: John Wiley & Sons, Inc.
- Churchill, N., & Lewis, V. (1986). Entrepreneurship research directions and methods. In D. Sexton, and R. Smilor, *The art and science of entrepreneurship* (pp. 333-366). Cambridge, MA: Ballinger Publishing Company.
- Cole, A., (1969). *Definition of Entrepreneurship*. Seminar in the study of enterprise. Center for Venture Management. Milwaukee, WI.
- Clodfelter, R. (1990, April). Preparing potential entrepreneurs for tomorrow's world. *Business Education Forum*, 40, 29-30.
- Clow, J. (1997). Entrepreneurship education: The changing dimensions of business education. *NBEA Yearbook*, 148-159.
- Collins, O. & Moore, D. (1970). *The organization makers: A behavioral study of independent entrepreneurs*. New York, NY: Appleton-Century-Croft, Meredith Corporation.
- Cooper, A. C. (1982). The entrepreneurship-small business interface. In C. Kent, D. Sexton, & K. Vesper, *Encyclopedia of entrepreneurship* (pp. 39-71). Englewood Cliffs, NJ: Prentice Hall, Inc.
- Cooper, A. C. (1986). Entrepreneurship and technology. In D. Sexton, and R. Smilor, *The art and science of entrepreneurship*, (pp. 153-168). Cambridge, MA: Ballinger Publishing Company.
- Cooper, A., & Dunkelberg, W. (1987, Winter). Entrepreneurial research: Old questions, new answers and methodological issues. *American Journal of Small Business*, 11(3), 11-23.
- Cuba, R. Decenzo, D. and Anish, A. (1983, Fall). Management practices of successful female business owners. *American Journal of Small Business*, 8(2), 40-46.

- Davis, L. (1963). *Characteristics of small business founders in Texas and Georgia*. University of Georgia, Bureau of Business Research. Small Business Administration, Washington D. C.
- DeCarlo, J., & Lynos, P. (1979). A comparison of selected personal characteristics of minority, and non-minority female entrepreneurs. *Journal of Small Business Management*, 17(4), 22-29.
- Dolinsky, A. Caputo, R, Pasumarty, K., & Quazi, H. (1993, Fall). The effects of education on business ownership: A longitudinal study of women. *Entrepreneurship Theory & Practice*, 18(1), 43-53.
- Douglas, M. (1976, December). Relating education to entrepreneurial success. *Business Horizons*, 19(3), 40-44.
- Drucker, P. (1985). *Innovation and entrepreneurship: Practice and principle*. New York, NY: Harper & Row Publishers.
- Duchesneau, D., & Gartner, W. (1990). A profile of new venture success and failure in an emerging industry. *Journal of Business Venturing*, 5(5), 297-312.
- Faris, J. (2003). *Small business policy guide*. National Federation of Independent Businesses. Washington, DC: 1201 F Street NW, Suite 200.
- Feldman, H., Koberg, C., & Dean, T. (1991). Minority small business owners and their paths to ownership. *Journal of Small Business Management*, 29(4), 12-27.
- Fiber, L. (1986, April). Entrepreneurship in the high school. *Business Education Forum*, 40, 27-29.
- Foley, A., & Griffith, B. (1998). Education, training and the promotion of high quality entrepreneurs in Republic of Ireland. In M. Scott, P. Rosa, & H. Klandt (Ed), *Educating entrepreneurs for wealth creation*, (pp. 80-93). Brookfield, VT: Ashgate Publishing Company.
- Gall, M., Borg, W. and Gall, J. (1996). *Educational research: An introduction*, (6th ed.). White Plains, NY: Longman Publishers.
- Garnier, B., & Gasse, Y. (1990). Training entrepreneurs through newspapers. *Journal of Small Business Management*, 28(4), 70-73.
- Gartner, W. (1988). "Who is an entrepreneur?" Is the wrong question. *American Journal of Small Business*, 12(1), 11-32.

- Gomolka, E. (1977). Characteristics of minority entrepreneurs and small business enterprises. *American Journal of Small Business*, 2(1), 12-21
- Grant, A. (1992). Entrepreneurship: The major academic discipline for the business education curriculum for the 21st century. In M. Scott, P. Rosa, & H. Klandt (Ed), *Educating entrepreneurs for wealth creation*, (pp. 28-37). Brookfield, VT: Ashgate Publishing Company,
- Greenberger, D., & Sexton, D. (1988). An interactive model of new venture formation. *Journal of Small Business Management*, 26(3), 1-7.
- Grimm, L. & Yarnold, P. (2000). *Reading and understanding more multivariate statistics*. Washington, DC: American Psychological Association.
- Halbrook, M. (2001). Comparing multiattribute attitude models by optimal scaling. *The Journal of Consumer Research*, 24, 165-171.
- Headd, B., (2000). The characteristics of small business employees. *Monthly Labor Review*, 123, 13-18.
- Herbert, R. & Link, A. (1988). *The entrepreneur: Mainstream views and radical critiques* (2nd ed.). New York, N.Y: Praeger,
- Hinkle, D., Wiersma, W. & Jurs, S. (1988). *Applied Statistics for the Behavioral Sciences*. One Beacan Street, Boston, MA: Houghton Mifflin Company.
- Hisrich, R. (1986). The woman entrepreneur: Characteristics, skills, problems and prescriptions for success. In D. Sexton, & R. Smilor, *The art and science of entrepreneurship*, (pp. 61-81). Cambridge, MA: Ballinger Publishing Company.
- Hisrich, R. (1988). Entrepreneurship: Past, present, and future. *Journal of Small Business Management*, 26(4), 1-4.
- Hisrich, R., & Brush, C. (1986). Characteristics of the minority entrepreneur. *Journal of Small Business Management*, 24, 1-8.
- Hodgetts, R., & Kuratko, D. (1998). *Effective small business management*. Fort Worth, TX: The Dryden Press.
- Holt, D. (1992). *Entrepreneurship: New venture creation*. Prentice-Hall, Inc. Englewood Cliffs, NJ: A Simon and Schuster Company.

- Hornaday, T., & Aboud, J. (1971). Characteristics of successful entrepreneurs. *Personal Psychology, 24*, 141-153.
- Hyungrae, J., & Jinjoo, L. (1996). The relationship between an entrepreneur's background and performance in a new venture. *Technovation, 16*(4), 161-171.
- Ibrahim, A., & Goodwin, J. (1986). Perceived causes of success in small business. *American Journal of Small Business, 11*(2), 41-50.
- Jacoby, W. (1999). Levels of measurement and political research: An optimistic view. *American Journal of Political Science, 43*(1), 271-301
- Karr, A. (1988, November 1). Labor Letter. *The Wall Street Journal, CCXII*(86), A-1.
- Katz, J. (2003). The chronology and intellectual trajectory of American entrepreneurship education. *Journal of Business Venturing, 18*(2). 283-300.
- Kent, C., (1984). The rediscovery of the entrepreneur. In C. A. Kent, *The Environment for Entrepreneurship*, (pp. 1-19). Lexington, MA: D.C. Heath and Company.
- Kerlinger, F., (1986). *Foundations of Behavioral Research* (3rd ed.). New York, NY: Harcourt Brace.
- Kiesner, W. F., (1984). *Higher education and the small businessperson: A study of the training and education needs, uses, and desires of the small business practitioner*. Unpublished doctoral dissertation, Claremont Graduate School. Ann Arbor, MI: University Microfilms International.
- Kilpatrick, S., & Crowley, S. (1999). *Learning and training: Enhancing small business success*. National Center for Vocational Research. Leabrook, Australia. ERIC (Document Reproduction Services, No. ED 437545).
- Knight, S. Waxman, H. & Padron, Y. (1989). Students' perceptions of relationship Between social studies instruction and cognitive strategies. *Journal of Educational Research, 82*(5), 270-276.
- Kuratko, F., & Hodgetts, R. (2001). *Entrepreneurship: A contemporary approach*. Fort Worth, Texas: Harcourt College Publishers.
- Kuratko, D., & LaFollette, W. (1986, March). A small business management entrepreneurship curriculum: A dual progression experience. *Journal of Education for Business, 61*, 267-270.

- Lambing, P., & Kuehl, C. (2000). *Entrepreneurship*. Prentice Hall. New Jersey, NJ: Upper Saddle River.
- Litvak, I., & Maule, C. (1980, Winter). Entrepreneurial success or failure: Ten years later. *Business Quarterly*, 45(4), 68-78.
- Long, W. (1983). The meaning of entrepreneurship. *American Journal of Small Business*, 8(2), 47-59.
- Maranville, S. (1992, September/October). Entrepreneurship in the business curriculum. *Journal of Education for Business*, 27-31.
- McClelland, D., (1987). Characteristics of successful entrepreneurs. *The Journal of Creative Behavior*, 21(3), 219-233.
- Mertens, D. (1998). *Research methods in education and psychology: Integrating diversity with quantitative and qualitative approaches*. Thousand Oaks, CA: Sage Publications, Inc.
- Miller, D. & Saklind, N. (2002). *Handbook of research design and social measurement*. (6th ed.). Thousand Oaks, CA: Sage Publications, Inc.
- Montagno, R., Kuratko, D., & Scarcella, J. (1986, Winter). Perception of entrepreneurial success characteristics. *American Journal of Small Business*, 11, 25-32.
- Murphy, G. Traile, T. & Hill, R., (1996). Measuring performance in entrepreneurship. *Journal of Business Research*, 36, 15-23.
- Nelson, G. (1987, July). Information needs of female entrepreneurs. *Journal of Small Business Management*, 25(3), 38-44.
- Noll, C. L. (1993, February). Planning curriculum of female entrepreneurs for entrepreneurship education. *Business Education Forum*, 47, 3-5.
- Pitman, T. R. (1988, April). Teaching entrepreneurship: Removing the myths. *Business Education Forum*, 42, 31-32.
- Robbins, N. (1986). *Entrepreneurial assessment: Characteristics which differentiate entrepreneurs, intrapreneurs, and managers*. Unpublished doctoral dissertation, University of Minnesota. Ann Arbor, MI: University Microfilms International.
- Roberts, E. (1991). *Entrepreneurs in high technology*. 200 Madison Avenue, New York, NY: Oxford University Press, Inc.

- Robinson, P., & Sexton, E. (1994). The effect of education and experience on self-employment success. *Journal of Business Venturing*, 9, 141-156.
- Rosa, P., & McAlpine, A. (1991). Career orientation towards enterprise. In L. Davis and A. Gibb, *Recent research in entrepreneurship*, (pp. 73-105). Gower/Avebury.
- Scarborough, N. & Zimmerer, T. (2000). *Effective small business management: An entrepreneurial approach*. Upper Saddle River, New Jersey: Prentice-Hall, Inc.
- Scott, M., Rosa, P., & Klandt, H. (1998). *Educating entrepreneurs for wealth creation*. Brookfield, Vermont: Ashgate Publishing Company.
- Scott, M., & Twomey, D. (1988, October). Long-term supply of entrepreneurs: Student's career aspirations in relation to entrepreneurship. *Journal of Small Business Management*, 26(4), 5-13.
- Sexton, D. & Bowman, N. (1986). Validation of a personality index. *Frontiers of Entrepreneurship Research*, 40-51. Babson College, Wellesley, MA.
- Sexton, D. & Smilor, R. (1997). *Entrepreneurship 2000*. Chicago, Illinois: Upstart Publishing Company.
- Sletten, J., & Hulaas, H. (1998). What and how should entrepreneurs be taught? Implications of different backgrounds and business goals. In M. Scott, P. Rosa, & H. Klandt (Ed), *Educating entrepreneurs for wealth creation*, (pp. 169-185). Brookfield, VT: Ashgate Publishing Company.
- Smith, M., & Steward, J. (1990, April). The business plan: Key to realism in teaching entrepreneurship. *Business Education Forum*, 44, 25-27.
- Soloman, G. (1982). *The relationship of selected characteristics of small business owner-manager to their businesses' probability of success*. Unpublished doctoral dissertation, George Washington University. Ann Arbor, MI: University Microfilm International.
- Solomon, S. (1986). *Small business USA: The role of small companies in sparking America's economic transformation*. New York, NY: Crown Publishers, Inc.
- Solymossy, E. (1998). *Entrepreneurial dimensions: The relationship of individual, venture, and environmental factors to success*. Unpublished doctoral dissertation, Case Western Reserve University. Ann Arbor, MI: University Microfilm International.

- Stull, W. & Labonty, D. (1993, February). Teaching interpersonal skills in entrepreneurship. *Business Education Forum*, 47, 10-13.
- Tabathnick, B. & Fidell, L. (2001). *Using multivariate statistics*. (3rd ed.). New York, NY: Harper Collins College Publishers.
- Timmons, J. A. (1994). *New venture creation*. (4th ed.), Homewood, IL: Irwin.
- Thompson, B. (1984). *Canonical correlation analysis: Users and interpretation*. Beverly Hills: Sage.
- Thompson, B. (1988). *Canonical correlation analysis: An explanation with comments on correct practice*. New Orleans: University of New Orleans and Louisiana State University Medical Center. (ERIC Document Reproduction Service, No. ED295957).
- United States Small Business Administration, Office of Advocacy, (2001). *A report to the President. 1999-2000*. (GPO) 99161881. Washington, DC: United States Government Printing Office..
- Vesper, K. H. (1990). *New venture strategies*. Englewood Cliffs, NJ: Prentice Hall.
- Vesper, K., & Gartner, W. (1997). Measuring progress in entrepreneurship education. *Journal of Business Venturing*, 12(2), 403-421.
- Vesper, K., & Gartner, W. (2001). *Compendium of Entrepreneur Programs*. University of Southern California. Lloyd Greif Center for Entrepreneurial Students. Los Angeles, CA.
<http://www.marshall.usc.edu/entrepreneur/postoffice/compendium/index.html>
- Watson, T., & Everett, J. (1996, October). Do small businesses have high failure rates. *Journal of Small Business Management*, 34(4), 45-62.
- Webber, W. (1981). Developing a relevant university entrepreneurship curriculum. In D. Sexton, P. and Van Auken (Ed), *Entrepreneurship education*. (pp.72-85). Proceedings of the 1981 conference on entrepreneurship education. Baylor University, Waco, TX.
- Weisberg, H. Krosnick, J., & Bowen, B. (1996). *An introduction to survey research, polling, and data analysis*. (3rd ed.). Thousand Oaks, California: Sage Publications, Inc.

Williams, M., & Reynolds, P. (1990). Discontinuance among new firms in retail: The influence of initial resources, strategy, and gender. *Journal of Business Venturing*, 12(2), 125-145.

Zeithaml, P. & Rice, G. (1987, January). Entrepreneurship/small business education in American universities. *Journal of Small Business Management*, 25(1), 44-50.