Walsh University

Understanding Undergraduate Entrepreneurship Programs: What currently exists and how collegiate studies can be leveraged to address the gender gap in the field

A Thesis by

Madeline Weisburn

Submitted in partial fulfillment of the requirements for a

Bachelor of Arts Degree with University Honors

December 2022

Accepted by the Honors Program

12/2/2022

Advisor Date

12/2/2022

Reader Date

12/2/2022

Honors Director Date

Understanding Undergraduate Entrepreneurship Programs: What currently exists and how collegiate studies can be leveraged to address the gender gap in the field

Introduction

I remember the email. I was sitting on the floor writing a paper at the last minute for an undergraduate marketing class when the notification flashed in the bottom corner of my screen. The subject line read, “Congratulations-Top 25!” I could not believe it.

My partners, fellow college students, and I had pulled together an entire business in seventy-two hours to submit to one of the most competitive undergraduate entrepreneurship pitch competitions in the country. We placed in the top twenty-five teams in the nation and would be competing for first prize of $50,000 in a month. It felt surreal.

Fast forward to the competition where I stood at the top of the stairs in a far-from-home lecture hall counting heads. There were some 90 undergraduates from across the country there to compete. Despite the honor of being in a room full of the brightest students of the next generation, I could not help the sinking feeling in my stomach. There were only eleven women competitors including myself and one of my other co-founders. Furthermore, my partners and I were there to pitch a menstrual period product business, which can be an uncomfortable conversation in male-dominated rooms. All the pride I had felt in our work and accomplishments faded away; I was back on defense.

While we won some money and received some good feedback, my team left that competition feeling doubtful. We knew there was going to be stigmatism around our brand and idea, but we were unprepared for having to defend our female perspectives in entrepreneurship. I

embody many of the characteristics that are often associated with entrepreneurship: ambition, grit, work ethic, motivation, intelligence, and creativity. This conference made me hyper-aware of the fact that when I am at peak authenticity for my personal brand, I am also at peak vulnerability. I would go home from the conference to my school that has no formal entrepreneurship program and be isolated for a whole different reason than I was at the conference. I went from meeting a bunch of entrepreneurs who might understand my struggles, to going home where my only entrepreneurial outlet was my business partners.

After arriving back in Ohio, after the conference, I had many thoughts. I hustled to put together this business, learned the necessary material, and developed my skills. I did that on my own, without the structure of an academic curriculum. I imagined a community for students without formal entrepreneurship programs at their schools. Then, I imagined people supporting me, educating me. I thought of the way that would accelerate the growth of my business and myself.

Since then, the start-up created for the pitch competition has ceased. As I sit here on the "failure" side of a statistic I was determined to beat, I cannot help but think about my fellow female entrepreneurs. The conversation surrounding entrepreneurship is filled with buzzwords. Entrepreneurs are often considered forward-thinking, ambitious, independent, confident, and sociable. Skills such as finance, communication, and sales are often the core focus of accelerator programs. However, entrepreneurship is also a roller coaster. This experience inspired me to explore current education opportunities for women entrepreneurs, specifically college-aged students.

Problem Statement

This paper will be an examination of formal undergraduate entrepreneurship education. The study seeks to identify gender gaps in entrepreneurship education. Furthermore, this study explores how universities support undergraduate women in entrepreneurship programs. The term "formal undergraduate entrepreneurship program" will be used often in this paper and needs to be defined.

"Formal" refers to institutionalized learning. Education takes many different formats that include (but is not limited to) videos, conferences, mentorship, self-study, podcasts, courses, books, tutoring, and networking. For the purposes of this thesis, formal education is the historical structure of primary, secondary, and post-secondary schooling (also known as institutionalized education). "Undergraduate" refers to a length of time - four-year institutions were evaluated in this study. "Entrepreneurship" is the subject of education programs evaluated. "Programs" frame this work in the pursuit of a bachelor's degree. Put all that together and the phrase "formal undergraduate entrepreneurship programs" means this thesis will evaluate students who pursue a bachelor's degree in entrepreneurship at a four-year institution.

This thesis will evaluate formal undergraduate entrepreneurship programs in the United States to further understand any gender gaps as it relates to the student entrepreneurs in these programs.

Literature Review

The first step necessary to establish a research direction for addressing entrepreneurial higher education for women is to review the existing literature that examines entrepreneurship education and women in entrepreneurship. This literature review studies relevant and scholarly literature on entrepreneurship education at universities and women in entrepreneurship.

Entrepreneurship Education

Entrepreneurship programs were first founded in the United States at the University of Michigan in 1927 (Staff, T.P.R., 2014). According to the Ewing Kauffman Foundation, an organization that provides educational resources and seed funding for entrepreneurs, the number of degrees and offerings of entrepreneurship programs has grown five times since its inception, with 3.3 percent of college first-year students reporting they want to own their own business in 2008 and one third of business incubators being based at universities by 2012 (Morelix, A., 2015).

This explosion in growth leads researchers to question the tenets of quality entrepreneurial education. When understanding what "good" looks like in entrepreneurship education, a few studies have identified hallmarks. According to Jack and Anderson (1998), entrepreneurship education is both a science and an art. Science is rooted in knowledge and skills; art is the attitude or creative processes applied to any given situation. Entrepreneurship education, especially in the formal context, works as a science; it is much easier to teach objective facts than it is to build characteristics. The art of entrepreneurship is loosely based on personality and experience. Guidance can be given, but the results of teaching an art are ambiguous and tough to measure (Jack & Anderson, 1998).

Peter Drucker, a management consultant, argued in his book that there is an additional layer to entrepreneurship, and that is the "practice. It is a knowledge base." (Drucker & Maciariello, 2015). Garavan and O'Cinneide (a professor of leadership practice at Edinburgh Napier Business School and a deceased professor of entrepreneurship at the University of Limerick respectively) write that these pillars manifest themselves in entrepreneurship as knowledge, skills, and attitudes. Formal education has historically prioritized knowledge,

disregarding skills, and attitudes (Garvan & O'Cinneide, 1994; Gedeon, 2017). Knowledge is identifying the problems that exist, skills are used to execute an idea, and attitude is the energy that is used to drive the business idea forward. For a comprehensive undergraduate entrepreneurial education to exist, it needs to include all three factors.

However, another study explains why a strong formal entrepreneurship education is challenging to achieve; it is "multidimensional and dynamic in nature" (Wei, et.al., 2019). Entrepreneurship and formal education are often described as juxtaposed to one another; they are two pieces of the puzzle that do not connect. Undergraduate studies work to teach within the context of a certain field. Entrepreneurship requires a loose adaptation of "fields." That is because "effective entrepreneurship education delivers the development of skills and competencies" (Binks, et.al., 2006) as opposed to an expert in a subject. Entrepreneurs are required to have a broad understanding of multiple fields to drive usable solutions. Rather than study a distinct subject matter, entrepreneurs must learn skill sets and processes that can be applied in any area of interest.

Fayolle, a professor of entrepreneurship at the Em Lyon School of Business, elaborates on this point highlighting structure of collegiate studies that makes teaching the science, art, and skill of entrepreneurship difficult. Undergraduate entrepreneurial education was not made for the departmental breakdown that universities are built on (2007). Studies at formal institutions are often classified in departmental subjects (such as the department of science, department of education, or department of business). Entrepreneurship struggles to fit any one subject mold because it is multidisciplinary in nature. Fayolle writes that universities should consider structuring entrepreneurship studies on the life cycle of a business: inception, survival, growth, expansion, and maturity. However, this would be a marked shift away from the structure of other

academic programs in college (Fayolle, 2007). Because of the undesired structure of university studies, “entrepreneurs may be antipathetic towards education in most forms” making it ineffective to develop academic courses on entrepreneurship (Curran & Stanworth, 1989). Entrepreneurs do not see how material taught in the classroom translates to their business (Gundry, et. al., 2014). If the structure of college proves incapable of meeting the needs of entrepreneurship students, it becomes difficult to explain the growth of the entrepreneurship programs at the collegiate level.

Embedded in the complicated between entrepreneurship and education is gender. Despite the growth or attitude of entrepreneurial students, some professors identify that the ratio of men to women does not scale at the same rate. When interviewed about women in entrepreneurship education, Prof. Linda Edelman from Bentley University said that enrollment in their programs is usually 50/50 female to male ratio at the onset. In later years, there is a steep drop in the number of female participants, usually leaving three females in a class of thirty (Eddleston, 2019). Prof. Edelman could only speculate as to why the number of female entrepreneurs dropped so significantly and encouraged further research to identify the root cause.

While evaluating reasons for the disparity between women and male entrepreneurship in education, another study found that entrepreneurship education “has a discouraging effect on students’ intentions to become entrepreneurs” (Slatvchev, et.al., 2012). Slatchev, Laspita, and Patzelt try to explain this finding, saying that entrepreneurship education acts as a reality check for students. Starting and owning a business is not for the faint-hearted (Winn, 2005). However, learning about entrepreneurship at such an early age is still beneficial because participants in studies have shown “higher intention at high connection alertness skills than those who did not participate” (Westhead & Solesvik, 2016). Those who participate in entrepreneurship education

are more engaged with greater direction in their entrepreneurial endeavors upon completion of learning programs as compared to those who do not participate. However, the critical piece of information here is the "completion" of these programs. If women are not even making it to the end of the entrepreneurship program, then it does not matter that they are more engaged.

Furthermore, Slatchev, Laspita, and Patzelt's study also found that females "were significantly less likely to report high intention" (Westhead & Solesvik, 2016) meaning they were unlikely to act on the material they had learned. So, if women made it to the completion of the program, they may have been engaged, but would also be less likely to participate in entrepreneurial endeavors, either in the program or after graduation, then their male counterparts.

In another study, researchers contemplated what the impact of catered education would look like for female entrepreneurs, but currently no formal or informal education systems exist solely for women entrepreneurs. The same study concluded that

> "The absence of formal and informal learning for women entrepreneurs serves only to inhibit their ability to counter the discrimination they meet. Informal learning such as professional networking, for example, would assist women entrepreneurs to support and advise one another when experiencing business-related discrimination. In the absence of education, there is only ignorance and surely this contributes to the ongoing prejudice women entrepreneurs encounter" (Davis, 2012).

Other researchers call on policymakers and educators to first address the prejudice by "understand(ing) the biases and barriers that adversely affect women who start their own businesses" (Winn, 2005). Those barriers include, but are not limited to, financing, the definition of success, family, education, and discrimination (Winn, 2005; Davis, 2012; Helms, 1997;

Minniti & Arenius, 2003; Mirchandani, 1999). In the interest of advancing women entrepreneurship, especially within education systems, it is important to acknowledge the gendered differences (discussed in the next portion of this literature review) in the field that contributes to the gap. If interest in entrepreneurial education is growing, there is an opportunity to fill in the gap between expectations of entrepreneurship and the reality of participating.

Women in Entrepreneurship

The motivations of women entrepreneurs may be a contributing factor to their participation in formal entrepreneurship education and the field as a career. This portion of the literature review will set the stage for women entrepreneurs, diving into some of the most relevant studies to date on women entrepreneurship. There is historical context that contributes to underlying social attitudes and behaviors of and towards women in business. This may have created an unconscious bias against women in various circumstances (Langowitz & Morgan, 2003). Though the purpose of this study is not to explore systemic sexism and its role in entrepreneurship, it provides context as to why some of the trends in research exist. In discussions revolving around this subject, there is a polarity in sides; some believe that the nature of entrepreneurship lends itself to a male disposition (Mirchandi, 1999); entrepreneurship is a high-risk career that involves confidence, independence, and decisiveness (which tend to also be traits lumped with masculinity). Some believe immediate environment primes each gender into those traits (Lewis, 2006). Despite the arguments of how entrepreneurship exists today, it is important to report on the current state as it is and provide explanations as to why certain instances might be present. Throughout this literature review, it became apparent that there were gendered work norms in the why, how, and what of entrepreneurial experience.

The motivations (the why) supporting entrepreneurial endeavors play a critical role in percent of women in the field, and the success they bare. In a study conducted on thirty-seven countries around the world, researchers found that men are fifty percent more likely to be entrepreneurs than women (Minniti & Arenius, 2003). Women look internally for their motivations in starting a business (i.e., "I want to be my own boss"), with the three most common reasons for business ownership being "personal freedom, security, and satisfaction" (Helms, 1997; Minniti & Arenius, 2003; Mirchandi, 1999). Maria Minniti, chair of the Entrepreneurial Society at the University of Syracuse, wrote these three factors indicate that women seek the flexibility that entrepreneurship provides. Entrepreneurship is a means of social mobility; they create their jobs to achieve what they cannot as employees of someone else. Men, on the other hand, look externally (i.e., there is a huge market opportunity) for motivation on the entrepreneurial front (Helms, 1997). This difference is critical because it influences every other facet of the business. From start-up to funding to long term goals, if the motivations early on are different, the creation impact will also differ.

For example, one study analyzed the difference between men and women's definitions of success. Women are concerned with the difference between entrepreneurship and self-employment, the impact of macroeconomics, and the conundrum of being risk-averse or being a risk-taker (Lepeley, et.al., 2020). This is telling of women's motivations. According to this study, women seek a healthy-work life balance, and see entrepreneurship as a means of greater flexibility. Rather than change the entire world, they want to change their own world. For women in this study, fulfillment is more than a financial outcome. This study acknowledges the tendency for women to be more conservative in their business ventures than men, if only to serve their own needs.

As the motivations (or the "why") for pursuing entrepreneurship differ, so too does the means (the "how") of executing the idea. Frequently men and women have different motivations, definitions of success, and barriers, but they also face other different external complications that hinder progress. One study analyzed the source of funding for various gendered entrepreneurs. Carmen Neithammer, a Senior Gender Specialist at the European Investment Banks says that female-owned businesses were more likely to embark on debt financing as a primary means of raising capital, rather than private equity, which is favored by men (Niethammer, 2013). Debt financing is when a person takes out a loan, often from a bank, to fund a venture. Mortgages and student loans are common uses of debt financing. Private equity financing is when an individual, often a venture capitalist or angel investor, puts up a sum of money to fund a project, and in return, they get equity in the company (the percent equity they get is dependent on the funds they invest. It is negotiated). For example, the popular show *Shark Tank* uses private equity in their show to fund the ideas that are presented. Often, it is easier to raise more funds through private equity than through financing institutions (banks will base the loan amount on historical information, whereas private investors will base their decision on the potential of an idea).

There are many reasons why women receive less funding: motivations, growth aspirations, and scalable business models. They may need less capital to achieve their goals (Langowitz & Morgan, 2003). However, researchers acknowledge that fulfillment desires can create a "detrimental perception that women are less focused and driven to succeed in their businesses than men, resulting in difficulties obtaining institutional or venture-capital financing (Brush, et. Al., 2004; Morris, et. Al., 2006). Another study cites that there should be no hesitation for investors to fund female-owned enterprises because they are "growing at a faster

pace than male-owned counterparts with no evidence that women-owned enterprises fail at a faster rate" (Niethammer, 2013).

Not only is there a financial barrier in the "how" of entrepreneurship, but there is also the matter of gendered work norms. The way in which people work and think affects what career they choose to base their business on. "That is to say that innovators are likely to be successful entrepreneurs in so far as they mimic the masculine work norm" (Mirchandi, 1999). Understanding the masculine work norm is challenging. One study suggests that the culture of entrepreneurship is shaped by most of the people involved. Entrepreneurship is dominated by men; therefore, entrepreneurship is gendered toward men (Lewis, 2006). This study goes on to elaborate that women entrepreneurs have two responses to this norm. First, women choose to gender their identity (I.e., "female entrepreneur" or "women entrepreneur"). Second, women choose gender-blindness, where they believe gender is no longer important when evaluating their success (or lack thereof) (Lewis, 2006).

The woman under the first category boldly attaches gender to her title to make a statement; it further differentiates herself in the entrepreneurial landscape. This has the potential to alienate passive users in the process. The initial approach of identifying a gendered title to tackle workplace norms places emphasis on demographic factors. Gender-blindness, on the other hand, refuses to solve the problem altogether by ignoring it. The study above believes this stance comes from a place of privilege (Lewis, 2006). Those who do not adopt the gendered soapbox have other means of advancing their endeavors that do not rely on identity. Rather than highlight differences based on identity, gender-blind female entrepreneurs focus the attention on the work and products they produce. Both stances have implications that are not fully understood (Lewis, 2006).

Both the why and the how of the female entrepreneurial endeavors then affects what they can accomplish. The industries that women and men perform business in also differ. Women are thought to open business in women-related fields (food, clothing, service, etc.). The combination of the motivation stereotype and the business function stereotype builds a "glass barrier" that "dampens the aspirations of potential women entrepreneurs" (Langowitz & Morgan, 2003). What is being touched on here is the unconscious expectation that women open certain kinds of businesses. When a woman has an idea that goes against those expectations, she is faced with obstacles to overcome that are not recognized as a barrier. This acts as deterrent for women who not only have to face the usual start-up hurdles, but also face scrutiny for doing something outside of societal norms. Women who choose entrepreneurship as a career face gendered constructs of the "why," "how," and "what" of the field. It may explain why so few women participate in entrepreneurship as a career.

Methodology

The research conducted for this thesis utilizes a mixed methodology. I wanted to search for a data set that could answer my questions about entrepreneurship education and the gender gap, while also finding qualitative information that could explain why those trends existed. First, quantitative research was conducted.

About the Data

While the original goal was to collect information about universities in the United States who had undergraduate entrepreneurship programs, the research process uncovered that no current data set exists evaluating the state of formal entrepreneurship education, making it difficult to assess gendered issues within programs.

This lack of information was identified early on, reinforcing the need for this study to begin to lay the groundwork for future studies. Universities do not openly share their data about how many people are in their programs, the gender breakdown of those programs, or the graduation rate from certain majors. This was unsurprising but challenging. In the competitive world of higher education, universities are selective about the information they share to maintain their reputations.

In some cases, universities reported numbers relating to their entrepreneurship programs, but it was in a marketing context, which may not be reliable data. There should be no chance for inflation of numbers. Raw data from a third party was preferred. College Navigator provided such a source.

Run by the National Center for Education Statistics (NCES), College Navigator is a public platform that reports on college statistics. It records information from over 7,000 colleges across the country. IPEDS (Integrated Postsecondary Education Data System) is what supplies all the data that runs through the NCES website. IPEDS data is submitted "at the aggregated-level from postsecondary institutions and does not have student-level information." The data only serves as analysis of the population, reporting collective numbers that cannot be drilled into (for example, I could see that 55% of the students at Walsh University were female, but there was no way of drilling into the IPEDS data to say what the gender breakdown of a specific program was). The data is collected through twelve surveys with three different reporting periods (fall, winter, and spring).

The surveys collect data in twelve different categories including 12-month enrollment, academic libraries, admissions, completions, fall enrollment, finance, graduation rates, graduation rates 200% (how many people end up graduating from the university beyond a typical

four-year program, on extended time), human resources, institutional characteristics, outcomes measures, and student financial aid. In this study, a few of these categories were specifically explored.

The IPEDS data, however, provided a unique opportunity for evaluating all entrepreneurship majors regardless of their titles because of the major categorization system. IPEDS data lumps majors into categories based on their curriculum. There were 4 major categories that related to entrepreneurship: entrepreneurship/entrepreneurial studies, entrepreneurial and small business operation, social entrepreneurship, and business and innovation/entrepreneurship teacher education.

When I evaluated this data set, I pulled schools that had at least one major in at least one of these categories. Universities needed to be four-year institutions. Only undergraduate programs were considered. Information relating to student population size, demographics, tuition, location, faculty, and accreditation were evaluated.

Once I had completed analysis of the IPEDS data, I realized there was opportunity for some of the gaps to be filled in. I started looking for another source of information that could provide more context on women entrepreneurs in higher education. Upon my search, the Global Entrepreneurship Monitor (GEM) was identified.

GEM was created in 1999 to run studies on entrepreneurship. It began as a joint project with Babson College and the London Business School. Since then, it has become one of the richest resources on entrepreneurship in the world, publishing national and internal reports on an annual basis. They have produced data for 22 years, conducting over 150,000 interviews a year

in 100 different economies. All their research is survey-based, with national country teams leading the efforts in association with the top academic institutions there (N/A, n.d.).

GEM's most recent report (published in 2022) on gender was conducted in 43 countries in 4 different regions: Central/East Asia, Europe/North America, Latin America/Caribbean, and Middle East/Africa. To further understand the results from each of these regions, GEM then places each country into one of three income levels based on the gross national income per capita (much like first-world, second-world, third-world country rankings). These country income brackets could then be overlaid with information collected by the surveys, providing contextual information for some of the responses.

The pairing of IPEDS data and the study conducted by GEM provided data suggesting what undergraduate entrepreneurship education and women entrepreneurship look like to the best of the current data's capabilities. Throughout the work and analysis of these resources, some key findings and obstacles were identified. These data sets, however, do provide the soundest information of any other resources available.

Research Questions

It was identified that there was a lack of understanding on what higher education was doing in entrepreneurship studies and what its capabilities were/are for addressing gender gaps in the space. The research questions posed for this study were to be answered by IPEDS data or qualitative research. Formal undergraduate entrepreneurship education would be examined in three ways; by the type of school that hosts the program, the accreditation of programs, and how diversity of gender is addressed.

This research aimed to understand the following:

Type of school that hosts undergraduate entrepreneurship studies:

RQ1: Does the type of school (public, private not for profit, or private for profit) influence the likeliness that there is an entrepreneurship program at the school?

RQ2: What kind of schools have what kinds of entrepreneurship programs?

The influence of the accreditations of the entrepreneurship program:

RG3: Did there exist any relationship between the type of school and the likeliness for an entrepreneurship program to be accredited?

RQ4: Was student population related to the accredited entrepreneurship programs?

Identifying and addressing the gender gap

RQ5: What is the gender breakdown of entrepreneurship programs?

RQ6: If there is a gender gap, what are schools doing to address it?

Data Analysis

For the analysis of the data, two different approaches would be applied. First, the IPEDS data would be evaluated through statistical techniques (such as descriptive statistics and regression analysis). Once the IPEDS data was thoroughly vetted, then GEM data, along with outstanding literature, would be used to qualitatively provide grounding for the findings. This twofold approach would allow for available resources to utilized to their fullest extent while answering critical questions regarding entrepreneurship education and women in entrepreneurship.

Procedure

First, IPEDS data was evaluated to see if it could answer any/all the research questions posed above. IPEDS data was accessed through an online website called College Navigator. College Navigator is a public access website built by the National Center for Education Statistics that allows users to see synthesized data. Users can access the raw data that powers website by clicking on the "About" in the top right-hand corner of the screen on the website. Through a series of clicks, users can access the IPEDS data on the NCES website, along with any other analyses that are published by NCES using the information.

Flat CSV files of the data could be downloaded for personal use. During the data cleaning process, the number and scope of fields was condensed. The fields that were used for this study were name of school, city, state, type of school (defined by degrees offered), type of school (defined by business model), undergraduate student population, tuition from 2018 to present, undergraduate full time to part time ratio, undergraduate male to female ratio, student to faculty ratio, program category, and accreditation. Those fields are defined as follows.

The name of the school is defined specifically to one location (the smallest granularity of the data). For example, Ohio State University has four branches. Each branch is its own location, and therefore is counted as its own "school," even though each branch falls under The Ohio State University umbrella. The city and state of the school are pulled from the address recorded by the National Center for Education Statistics. The first "type of school" field refers to the type of degrees offered by that college. There are two classifications: two-year institutions and four-year institutions. Two-year institutions provide certifications and associate degrees. Because of the framework built for this thesis, only four-year institutions were considered. The second "type of school" field referred to the business model of the school. These universities could then be lumped into three different types of four-year institutions based on their business model: public,

private-not-for-profit, and private-for-profit. All schools receive some funding from tuition, but the rest of their income is dependent on the type of school they are. Public universities are owned by the state and receive public funds through the state and national government. Private not-for-profit universities may receive some state funds, but most of their money comes from tuition, donations, and fundraising. All the money private not-for-profit universities make is reinvested in the school. Private for-profit universities make money from and for their shareholders. Their revenues do not need to be reinvested in the classroom and can be used for saying marketing materials or growing the business. Private for-profit schools make money from shareholders investing in the business. The combination of the two streams of revenue gives the school its business model and its second "type of school" classification. The next field, student to faculty ratio, records what the student population size looks like in comparison to the number of undergraduate professors. The field after that recorded the total undergraduate student population at the school. Other fields such as the full-time to part-time student ratio and gender breakdown are based on this number (i.e., a school might report a 58% female undergraduate student population with a total undergraduate student population size of 2,000 and 58% of the those 2,000 – 1,160 – are female). The next field recorded the categories of majors for which a school had a program. In order to be considered for this study, a school had to have at least one major classified in one of the four defined entrepreneurship major categories. The next field to be recorded was the accreditation field. This field showed how many awards a major category had received in the past year at the specified school. The last field that was considered related to tuition. The way schools charge tuition differs based on business model. Private schools often have one rate for students. Public state schools sometimes have an in-state tuition rate and an out-of-state tuition. Community colleges (which are also public) might take it a step further and

have an in-district tuition rate, for those who lived closest to the school. When looking at tuition through the district, in-state, out-of-state hierarchy, private schools have the least complicated structure, because they have the same rate across all the categories of students.

The finance category also reports on fees. Every school differs on what they place in the "fees" category. This could include books or other various expenses accrued while attending. The variable difference on what schools included in "fees" made this statistic unreliable to compare across schools (but helpful for individual students who were looking to budget their college experiences). For this study, the "fees" field was ignored.

All this information was stored in an Excel file that was then used for data analysis. Several tests were run to understand what the data was saying. Descriptive statistics (such as average, mean, median, mode) were conducted to understand what was happening on a macro level within the data. Then, various regression analyses were conducted to understand the relationships between any of the given fields.

When cleaning the data for this study, four-year institutions were selected. They had to offer bachelor's degrees in one of the four categories covering entrepreneurship in IPEDS data. There were 304 universities across the United States that met those specifications. Data was recorded for this entire population. Fields, such as the type of school (public, private not for profit, and private for profit), the number of undergraduate students, the student to faculty ratio, the tuition expense, the number of full-time students, the number of part time students, and the gender breakdown of the student population was manually recorded. Furthermore, information relating to any accreditations the program had received in the past academic year was also documented. This information would then be manipulated to answer the research questions set out at the beginning of this project.

Once the statistical analysis was run, then qualitative resources would be revisited to qualify the findings of this study. The GEM data and findings, along with other secondary resources, would be used to qualify the findings in IPEDS.

Results

Understanding the population

According to IPEDs data, there are more than 7,000 higher education institutions in the United States. This includes technical schools, two-year institutions, four-year institutions, and graduate programs. Furthermore, branch campuses count as separate institutions (for example, The Ohio State University has its main campus in Columbus, Ohio with four regional campuses. Each branch is counted as a distinct site. Therefore, OSU has five higher education institutions under its name). This study analyzes only four-year institutions in the United States, which include 2,679 schools total. 772 of them are public, 1,568 are private not-for-profit, and 339 of them are private-for-profit. In this study, 38% of the universities were public, 57% were private not for profit, and 4% were private for profit.

As of 2022, there are only 304 four-year institutions that have entrepreneurship programs. Of those schools 251 have programs that would be classified as "Entrepreneurship/Entrepreneurial Studies," 29 schools have a "Business and Innovation/Entrepreneurship Teacher Education" program, 21 schools have "Entrepreneurial and Small Business Operations, Other" programs, and 3 schools have "Social Entrepreneurship" programs.

At these 304 universities there were a total of 2,146,668 students. There are a total of 921,433 (42%) male students at these universities, as compared to 1,229,487 (58%) female

students. Because of the limits of the aggregated data, a determination on the number of students in each of the programs or the number of entrepreneurship students total was not able to be determined, nor was the gender breakdown of those programs able to be identified.

The average undergraduate student population at these universities was 7,061 students. Schools ranged from 55 undergraduate students to 63,752 undergraduate students. There existed a correlation between the type of school (public, private not for profit, and private for profit) and the number of students at the university. A p-value of 4.66E-06 was returned with an r-squared value of 0.07 (while the type of school and the number of students was related, there was not a strong relationship between those two variables). If the school was private for-profit schools had the largest student populations, with public schools coming in second and private not-for profit schools coming in third on student population size.

Tuition for the past school year (2021-2022) averaged $22,633.15 across 304 schools. The minimum of all tuition costs for the schools studied was $2,367 with the maximum being $62,304. Tuition is one of the possible revenue streams for schools and provides a money-related field for other fields to be related to.

After the descriptive statistics were recorded and understood, the data was tested to answer the specific research questions this thesis tried to understand. If the questions could not be answered through IPEDS data, secondary resources would be used to answer/elaborate on the topic.

Research Question 1: Does the type of school (public, private not for profit, or private for profit) influence the likeliness that there is an entrepreneurship program at the school?

This question was answered during the initial descriptive statistics. Most of the schools in the study were private not for profit. To understand if the proportions stood at the population level (all four-year schools in IPEDS data), the percentage of schools in each business model were compared from the sample of 304 schools that had entrepreneurship programs to the population of four-institutions.

The count ratio of public to private not-for-profit to private for-profit schools was compared between the sample in this study and the population of all four-year institutions. The counts are similar between the sample (all the schools with entrepreneurship programs) and the population (all four-year institutions). The differences between the sample and the populations are apparent in the number of for-profit schools. Of the total population, for profit schools are 12% of the count, whereas in the entrepreneurship school sample, only 4% of schools are classified as for-profit. The difference is attributed to the public schools in the sample data. Private not for profit is 57% and 58% of the count of schools in the two sets, so there is little change between the two.

The small number of for-profit schools that have entrepreneurship programs might suggest that these schools do not see entrepreneurship as a viable field of study from the business standpoint (there are so few students that seek out entrepreneurship programs, that there is no need to host such a program). However, there was no relationship between the type of school and the likeliness for an entrepreneurship program to be present.

Research Question 2: What kind of schools' host what kinds of entrepreneurship programs?

H1O: The type of school is not related to the type of entrepreneurship program

H2N: The type of school is related to the type of entrepreneurship program

The type of school refers to public, private not-for-profit, and public for-profit. The type of entrepreneurship program refers to “Entrepreneurship/Entrepreneurial Studies,” “Business and Innovation/Entrepreneurship Teacher Education,” “Entrepreneurial and Small Business Operations, Other,” “Social Entrepreneurship” programs. This is a way of classifying majors for comparison. Every school might title their entrepreneurship programs differently. IPEDS evaluates the curriculum from various majors and lumps them into categories based on the similarity of studies. In the IPEDS data, a school will have all the categories listed for which they offer programs. One downfall to this system, however, is that a school might have “Entrepreneurship/Entrepreneurial Studies” listed on their programs and offer multiple majors under that umbrella. There is no way of knowing how many individual majors a school has under a certain program category based on IPEDS data.

The regression analysis for this question tested whether there was a relationship between the type of school (business model) and the category of entrepreneurship programs. According to the results of the regression analysis, there was no relationship between the type of school and the category of entrepreneurship program they had (fail to reject the null). The r-squared value was 9.34E-05, meaning the variable was not statistically significant. The p-value was 0.8667, indicating no relationship between these two variables. Any type of school could have any category of entrepreneurship program.

To further understand this result, another regression was run to see if there was a correlation between the count of programs at the school (did the school have multiple entrepreneurship category programs listed and did that relate to the type of school). There were only 19 schools that offered programs in multiple program types (about 6% of schools offered degrees in more than one type of program classification). After running another regression

testing the correlation between the type of school and whether a school had a second type of program, there appeared to be no correlation. The r-squared value was 0.0013, and the p-value was 0.5252.

Research Question 3: Did there exist any relationship between the type of school and the likeliness for an entrepreneurship program to be accredited?

H3O: The accreditation of an entrepreneurship program is not related to the type of school.

H3A: The accreditation of an entrepreneurship program is related to the type of school.

College Navigator reported on the most recent school year (2021-2022) awards and accreditations for programs offered at the school, though this field is tough to define. College Navigator does not report on the type of awards, who grants the award, or how the awards are determined. The accreditation field is ambiguous. However, it is the only indicator in all of the IPEDS data that points to the quality of the program offered. The data breaks down the accreditations based on the degree that is offered (I.e., a school might offer an associate, bachelor, master or doctorate degree in the subject. Schools would earn awards for a specific degree in a certain subject). For the purposes of this study, only the school's accreditation information for the bachelor's degree in at least one of the four major categories was recorded.

Of the 304 schools in this study, 41% of schools (126/304) had awards for their undergraduate entrepreneurship programs. Schools had several awards ranging from zero awards to eighty-two awards, while the average hovered at five.

The relationship between the type of school and the likeliness of the program to be accredited was nonexistent (fail to reject the null). A regression analysis test was run with

accreditation as the dependent variable and type of school as the independent variable. An r-square score of 0.0013 was returned. There was a p-value of 0.52 between the variables. These results showed that it did not matter the type of business model a school had when it came to accolades.

Not only is the awards and accreditations field unrelated to any other field in the study, it is also tough to define. College Navigator does not report on the type of awards, who grants the award, or how the awards are determined. The accreditation field is ambiguous. However, it is the only indicator in all that data that points to quality of the program specifically.

Based on the number of awards and accreditations alone, below are the top ranked programs in IPEDS data for entrepreneurship:

1. Florida State University (82 awards) & Arizona State University Campus Immersion (82 awards)
2. Grand Canyon University (75 awards)
3. The City University of New York, Bernard M. Baruch College (67 awards)
4. Ashford University (62 awards), Central Michigan University (62 awards), Loyola Marymount University (62 awards)
5. Oklahoma State University – Main Campus (51 awards)

These results vary when compared to other 3rd party rankings of entrepreneurship programs. According to Entrepreneur.com, Florida State ranked number 19 in the country and Loyola 32nd (Staff, 2021). The rest of the schools with top accreditation scores in IPEDS data did not even make the top 50 schools Entrepreneur.com vetted. Entrepreneur.com collaborates with the Princeton Review to put together this list on an annual basis. They collect more than 40 fields

of data based on surveys collected from the schools. 300 (close to the total population of schools with programs, according to this study's data) reported their entrepreneurship offerings (*Top schools for entrepreneurship studies 2022 press release, n.d.).* The Princeton Review and Entrepreneur.com take a wholistic approach to analyzing the entrepreneurship programs, considering curriculum, funding (of the department and for ventures), enrollment, faculty, mentors, venture competitions, and alumni businesses (*Entrepreneurship ranking: Our Methodology,* n.d.). This study only identifies one field that might demonstrate the quality of the program. Awards and accreditations alone do not determine a quality entrepreneurship education.

Research Question 4: Was student population related to the accredited entrepreneurship programs?

H4O: The accreditation of an entrepreneurship program is not related to student population.

H4N: The accreditation of an entrepreneurship program is related to student population.

After running the regression analysis on student population and the accreditation of a university, there appeared to be no correlation between the two variables (fail to reject the null). An r-squared value of 0.01 was returned with a p-value of 0.05. Interestingly, this was the closest any of the regressions came to being statistically significant (if a p-value of less than 0.05 is returned, then there is a correlation between the two variables). This then raised interest in seeing if the number of awards correlated to the number of students (this distinction is important; the first regression was just comparing student population count to whether the school had any number of awards. The second regression ran would compare the count of both fields).

When the second regression was run there was, in fact, a correlation between the number of awards a school had received for its entrepreneurship program and the number of students that attended the school. The second regression returned a p-value of 2.02E-22, though the r-squared value of 0.27 suggests the relationship is not strong. Schools that had larger student populations were more likely to also be accredited.

Research Question 5: What is the gender of the breakdown of entrepreneurship programs?

> *H5O: The gender breakdown of entrepreneurship programs is not significant as compared to the whole student population (more than 75:25 split in either direction).*
>
> *H5A: The gender breakdown of entrepreneurship programs is significant as compared to the whole student population (more than a 75:25 split in either direction).*

This question was unable to be answered through IPEDS data and was one of the primary subjects focused on for further qualitative analysis. Because IPEDs data is aggregated, there was no way to tell the gender breakdown of a specific program. This topic is further explored in the Global Entrepreneurship Monitor (GEM) data and limitations section of this paper.

Research Question 6: If there is a gender gap, what are schools doing to address it?

Because of the nature of the data that was collected in this study, this question could not be reported on. For similar reasons to research question 5, anything related to the gender of students in a specific program could not be reported on. Quantitative research uncovered very little information regarding the relationship between gender and formal entrepreneurship programs.

Analysis

Once the IPEDS data was analyzed, the search began for any qualitative research that had been done to fill in the gaps and address the limitations of the data. The Global Entrepreneurship Monitor provided such a source.

Global Entrepreneurship Monitor

Because the data set collected for this study was unable to report on the gender gap as it relates to entrepreneurship by itself, other resources provided context as to how women are currently participating in entrepreneurship. The GEM data reaffirmed many of the findings from the articles in the literature review.

Globally, the total early-stage entrepreneurial activity (TEA) was a 11% less for women than men. Low-income countries showed the highest average rate of female TEA (17.1%). High-income countries sat at 8.9%. Specifically, Europe and North America saw the lowest rates of female TEA at 5.7% (Elam, et. Al., 2022). This connects to the idea that women are motivated to start their businesses when it serves a personal need. In countries like the United States, where there are ample opportunities to support oneself, women are more likely to seek pre-created options when possible.

Furthermore, women across all income levels are much less likely to own/manage established businesses (EBO). However, women are less likely to close businesses if they do become established. 1.7% of women in North America closed shop in the past year where 2.7% of male-owned businesses closed shop (Elam, et. Al., 2022). Women were also less likely than men to report businesses closure due to lack of financing than men.

Women reported that their influences for becoming entrepreneurs were one of three things: job scarcity, making a difference, and continuing a family tradition. Men on the other

hand were more likely to report starting a business to generate wealth (Elam, et. Al., 2022). This has the potential to create a financial gap between male and female owned businesses.

Both men and women participate in entrepreneurship at its highest rates between the ages of 18-34. The lower the income of the country, the younger the entrepreneurs were. The study also found that women entrepreneurs tend to be older than their male counterparts. In the GEM report, researchers stated that "Women represent some of the youngest, poorest and least educated entrepreneurs in the world" (Elam, et. Al., 2022).

It is important to note, however, that the GEM data is reporting women entrepreneurship that is not confined to a certain age group, race, ethnicity, or most importantly as it related to this study, education level. This is a complete look at women in entrepreneurship around globe, despite their background. This study was trying to understand women in entrepreneurship within a specific context (higher education). However, the GEM data is the most complete look at women entrepreneurship that exists to date.

Limitations

Inherently, limitations exist utilizing IPEDS data. IPEDS does collect demographic information about the university student body, but not for specific programs. For example, College Navigator reports that at Walsh University, 55% of undergraduate student population is female. Out of the entire student body, 84% are considered full-time (12-18 credit hours per semester). In that same population, 48% of students are Caucasian. While this is valuable information to know about the student population, it is impossible to say what a sample of student's demographics looks like creating a major limitation in this study. When the study was first designed, a projected outcome was to explicitly state the gender breakdown of

entrepreneurship programs around the country. Because the data was aggregated this was impossible to determine. Rather, entrepreneurship studies as they relate to the school could be studied. After making this discovery, I decided to continue the thesis with the variables that were available.

Furthermore, the study was not able to say with certainty what higher education was doing for the gender gap that many of the studies in the literature review spoke on. It simply allowed for the scope of entrepreneurship programs to be reported on. In the recommendations for future research, there should be an intentional collection of data relating to higher education and entrepreneurship, especially as it relates to specific demographics variables. The results of this study led to one final question and umbrella limitations for this study: Do entrepreneurs go to college? Some of the studies in the literature review suggested that entrepreneurs may not attend college. Entrepreneurs are usually innovators and creators who will bootstrap their way to success. College can be seen as a more traditional route to a specific end goal (usually employment). Entrepreneurs do not often strive to be employed or learn one specific subject. Therefore, they may be more apt to pick less conventional education mediums including conferences, learn at your own pace programs, online courses, simulators, accelerator programs, etc. Understanding the types of learning opportunities entrepreneurs are interested in influences whether higher education programs are seen as worthwhile. Some of the most famous entrepreneurs of the day, including Walt Disney, Bill Gates, and Mark Zuckerberg did/do not have college degrees (Toren, 2011). Many entrepreneurial success stories today do not include formal studies.

In fact, there are programs that pay entrepreneurs not to go to college. Started in 2011, the Thiel Fellowship started a two-year program where young entrepreneurs receive $100,000 to

Commented [Ma1]: Should this go later in the paper like it did in my presentation?

skip or drop out of college and pursue their business ideas (N/A, 2011). With financial backing, young entrepreneurs (age 22 or less) can build their businesses through a well-connected network. To this day, the Thiel Fellowship continues to be an alternate route to education designed with the prospective student, the entrepreneur, in mind.

Findings

Several broad assumptions were identified at the onset of this study that would help shape the direction of this research. First, entrepreneurs are students of the world, not the system. The more that was revealed about college culture in this study, the more it was understood why entrepreneurs might not see university as a viable way to learn the skills they desired. Universities taught students specific topics (major courses of study). One of the biggest assumptions was that universities were uninterested in investing in entrepreneurship because entrepreneurs were uninterested in college. The entrepreneurial authors highlighted in this study spoke of fostering their spirit on their own. They did not believe in college, nor did they fit the "college-type." The gap in entrepreneurship programs as explored in this study might be attributed to the lack of interest within the target market for university offerings.

This study was not able to shed light specifically on whether entrepreneurs sought out formal entrepreneurship education. However, the literature review brought to light sources that offered support for the assumption. Furthermore, this study indirectly pointed to the lack of interest in university entrepreneurship programs. Out of the 7,000+ universities in the United States, 2,679 of them were four-year institutions. Only 304 of those four-year institutions offer undergraduate entrepreneurship programs. That is a little over 11% of universities. That statistic in and of itself is telling. Most schools did not even entertain the major.

The second assumption was that schools with large student populations would be more likely to have entrepreneurship programs. Because of the various business models schools can be built on, large student populations could be a sign of a larger money-making machine (part of the revenue comes from tuition, which is a greater sum the more students there are. Also, the more alum a school produces, the more possible dollars a school could tap into from alumni dollars). Because the literature review suggested that entrepreneurship programs stood on three pillars (the science, the art, and the practice), it felt as if an entrepreneurship program would take more money to execute properly. This study could not say that a larger student population was an indicator of entrepreneurship programs being present at the university. Further research would have to be conducted to understand the relationship between funds and the programs that a university hosts.

The third assumption was critical: women would be severely underrepresented in entrepreneurship programs. This could have several underlying reasons relating to history, nature of the work, accessibility to resources, societal expectations, etc. The literature review indicated that there was not enough being done in the field to account for those obstacles, and the thought was that this trend would be reflected in universities as well. Entrepreneurship in and of itself is a challenging occupation. Entrepreneurs who face other significant obstacles out of their control might be further deterred from the field. This study was not able to speak on what formal education systems do to support women in their entrepreneurial endeavors.

Despite limited understanding how gender and formal entrepreneurship education intersect, it is important to note that college can serve as a steppingstone for people to engage in a different lifestyle than they knew before. Even if women do not participate in entrepreneurship programs at the same rate as men (which remains to be verified), gender-minorities especially

value education as a means of changing their position (there were more female students than male students at the universities in this study). In a study conducted by the Pew Research Center 53% of the enrolled college students aged 18-24 were women. Among women ages 25-29, 36% had at least a bachelor's degree, as compared to 28% of men in that same age range (Wang & Parker, 2019). Higher education is a prime opportunity to meet females where they are and give them the necessary tools to be successful, especially in entrepreneurship.

Though some qualitative research and the limitations of this paper suggest higher education and entrepreneurship are incompatible, "entrepreneurship is one of the fastest growing subjects in today's undergraduate curricula. In the past three decades, formal programs in entrepreneurship have more than quadrupled" (Schramm, 2008). What is more "well over 400,000 students a year take courses in the subject and almost 9,000 faculty members teach it" (Torrance & Rauch, n.d.). There seems to be support for entrepreneurship in undergraduate settings, but where and why these programs are appearing is still up for debate.

In conclusion, the relationship between all this information is complicated. IPEDS reports 11% of schools in the United States offer entrepreneurship programs. GEM reports that there is a promising market in young female entrepreneurs. The Ewing Marion Kauffman Foundation reports that the market of student entrepreneurs is growing. Yet, there is still a gap in understanding how all this information is overlayed. Not one study, including this one, can answer what is being done in formal undergraduate studies to address the gender gap. In order to answer those questions, new research needs to be designed and conducted.

Recommendations

In the future, it would be helpful to know how many self-identified entrepreneurs went to college. This would help reveal whether entrepreneurs even go to school. There seems to be a disconnect between the information that suggests that entrepreneurship studies in the United States is one of the fastest growing fields for undergraduates (Morelix, 2015; Schramm, 2008; Torrance & Rauch, n.d.) and the information this study and others (Fayolle, 2007; Gundry, et.al., 2014; Curran & Stanworth, 1989) report on saying that there might not be a market for formal entrepreneurship education. If there is not a present consumer base, then there exists no reason to develop a system for it.

Furthermore, understanding the type of degrees that entrepreneurs seek out would be valuable information. The degrees that self-identified entrepreneurs have would be telling of the impact that entrepreneurship programs around the country. It would show if people who graduate with entrepreneurship degrees pursue entrepreneurship as a career. If not, it would indicate which majors lend themselves to the life of an entrepreneur.

To further gauge the market for entrepreneurship education, it would be valuable to set up an interview style study with entrepreneurs that have ranging degrees of success (the study would have to define what success looks like, which can be complicated, as the literature review highlighted). This would allow researchers to hear firsthand from potential students (the entrepreneurs) what expectations and needs are from educational resources.

Despite the aggregation obstacles IPEDS posed to this study, there is one category of majors that exists that is particularly interesting as it relates to this study. The “Business and Innovation/Entrepreneurship Teacher Education” differed from the other three program types in that this major category was not about running a business or developing ideas but learning how to teach *others* to run successful businesses themselves. This major category could be seen as an

attempt to grow education programs around entrepreneurship education. It is a specialized version of an education degree, rather than a business degree. There were only 29 schools that offered programs that fell into this category. The creation of this classification of majors indicates that it is known entrepreneurs need to be taught in a different manner. It would be interesting to explore the curriculum for the majors that fall into this category to understand more fully what sets these degrees apart from other education and entrepreneurship majors.

There is room to explore the relationship between funding and the "success" of the program. Though this study did not find a correlation between the number of students and tuition rate as it compares to the likeliness of entrepreneurship programs to be present at the university, universities do receive funding in a variety of ways. Schools receive endowments and donations that also support its legacy building. Funding might play a role in the quality of the entrepreneurship program at the school. As research in this thesis suggests, entrepreneurship is a combination of art, science, and skill. The success of fulfilling those three areas could be measured through the dropout rates of entrepreneurship students. Because of some of the suggestions made in the literature review studies and through the research here, it might be possible that entrepreneurship students drop out of college more often than the average student because university studies are not the right fit for them. By extension, funding is what makes it possible to meet the student's needs.

Despite the direction of future research, it is important to move towards providing context for the trends seen in student and women entrepreneurship and how they intersect. Research done in the future needs to answer critical questions as:

- "Why do entrepreneurs go to college?"
- "Do they go to college with the intent of being entrepreneurs?"

- "Do they major in entrepreneurship if that is the career they are pursuing?"
- "Do women entrepreneurs enter college at the same rate as their male counterparts?"
- "Are their retention rates the same as their male counterparts?"

Conclusion

This study sought to substantiate my experience at the pitch competition by examining the disparity in gender in collegiate entrepreneurship programs. However, many questions were left unanswered because of the way existing data was aggregated and because of the lack of research done on formal undergraduate entrepreneurship education and its intersection with gender. There was not sufficient information to confirm or deny assumptions regarding the undergraduate entrepreneurial experience. There is a dire need for research to be done on undergraduate entrepreneurship programs. Throughout this thesis critical conversations were invoked about the entrepreneurship community and what needs to be done in the collegiate setting to help students pursue this career path.

There was no clear distinction on whether gender was being addressed in higher education, but the status entrepreneurship holds in undergraduate studies was able to be reported on. Just over 11% of universities have entrepreneurship programs for undergraduate students. For a major that is said to be one of the fastest growing in the country, not even a quarter of the four-year institutions in the United States have a program. There lies immense opportunity to capitalize on the interest in entrepreneurship as a career and create learning systems for acting on passion.

Afterword

On a personal note, this thesis is the most difficult project I have done in my undergraduate experience. It was inspired by my side hustles as a freelance musician and small business owner. It morphed into a reflection on the value I saw in my own degree from university. While writing this, I started a business, disbanded a business, won a few awards, networked, traveled, interned, worked, learned, and wrote (a lot, both for this thesis and otherwise). I strive to intertwine my two worlds of aspiring entrepreneur and student because they both shape who I am. While this is the beginning of my contributions to entrepreneurship and higher education, I will continue work towards the development of learning systems for those who do not fit into the stereotypical student mold, especially women entrepreneurs. I pray for the day when a female entrepreneur walks into a pitch competition and does not feel the urge to count heads. As a reminder to myself and other hustling students, “If you are not working on your goals, somebody will hire you to work on theirs” (Tony Gaskins). Thank you for reading and supporting me, the entrepreneurial student behind this work.

References

About IPEDS. The Integrated Postsecondary Education Data System. (n.d.). Retrieved September 30, 2022, from https://nces.ed.gov/ipeds/about-ipeds

Binks, M., Starkey, K. & Mahon, C.L. (2006). Entrepreneurship education and the business school, Technology Analysis & Strategic Management, 18:1, 1-18, DOI: 10.1080/09537320500520411

Brush, C. (1992). "Research on Women Business Owners: Past Trends a New Perspective and Future Directions," Entrepreneurship Theory and Practice16(4), 5–30

Curran, J. and Stanworth, J. (1989). "Education and training for enterprise: problems of classification, evaluation, policy and research", International Small Business Journal, Vol. 7, pp. 11-22.

Davis, P.J. (2012). "The global training deficit: the scarcity of formal and informal professional development opportunities for women entrepreneurs", *Industrial and Commercial Training*, Vol. 44 No. 1, pp. 19-25. https://doi.org/10.1108/00197851211193381

Drucker, P. F., & Maciariello, J. A. (2015). *Innovation and Entrepreneurship: Practice and Principles*. Routledge.

Eddleston, K. (2019, July 2). "More women should study entrepreneurship." *Entrepreneur & Innovation Exchange*. Retrieved May 13, 2022, from https://eiexchange.com/content/more-women-should-study-entrepreneurship

Elam, A. B., Hughes, K. D., Guerrero, M., Hill, S., Nawangpalupi, C., Del Mar Fuentes, M., Gonzalez, J. P. D., Laviada, A. F., Martinez, C. N., Banon, A. R., Chabrak, N., Brush, C.,

Baumer, B., & Heavlow, R. (2022). *Women's Entrepreneurship 2020/21: Thriving through crisis*. Global Entrepreneurship Monitor Consortium. Retrieved September 17, 2022, from https://www.gemconsortium.org/file/open?fileId=50841

Entrepreneurship rankings: Our methodology. Entrepreneurship Rankings: Our Methodology | The Princeton Review. (n.d.). Retrieved September 19, 2022, from https://www.princetonreview.com/college-rankings/top-entrepreneur/methodology

Entrepreneurship Search Results. College Navigator - Search Results. (n.d.). Retrieved May 12, 2022, from https://nces.ed.gov/collegenavigator/?s=all&p=52.0799%2B52.0701%2B52.0704&l=91%2B92%2B93

Fayolle, A. (2007). *Handbook of Research in Entrepreneurship Education. A general perspective* (Vol. 1). Edward Elgar Publishing.

Garavan, T. N., & O'Cinneide, B. (1994). Entrepreneurship Education and Training Programmes: A Review and Evaluation - Part 1. *Journal of European Industrial Training*, *18*(8), 3–12.

Gundry, L. K., Ofstein, L. F., & Kickul, J. R. (2014). Seeing around corners: How creativity skills in entrepreneurship education influence innovation in business. *The International Journal of Management Education*, *12*(3), 529–538. https://doi.org/10.1016/j.ijme.2014.03.002

Helms, M. M. (1997). Women and Entrepreneurship: The Appealing Alternative. *Business Perspectives*, *10*(1).

IPEDS (Integrated Postsecondary Education Data System) Survey Components. Survey components. (n.d.). Retrieved September 30, 2022, from https://nces.ed.gov/ipeds/use-the-data/survey-components

Jack, S. L. & Anderson, A. R. (1998). Entrepreneurship Education within the Condition of Entreprenology. Proceedings of the Conference on Enterprise and Learning, Aberdeen

Langowitz, N. S., & Morgan, C. (2003). 5. In J. E. Butler (Ed.), *New Perspectives on Women entrepreneurs* (pp. 101–115). essay, Information Age Pub.

Lepeley, M.-T., Kuschel, K., Beutell, N., Pouw, N., & Eijdenberg, E. L. (2020). *Wellbeing of Women in Entrepreneurship: A Global Perspective*. Routledge.

Lewis, P. (2006). The Quest for Invisibility: Female Entrepreneurs and the Masculine Norm of Entrepreneurship. *Gender, Work & Organization*, *13*(5), 453–469. https://doi.org/10.1111/j.1468-0432.2006.00317.x

Liu X, Lin C, Zhao G, Zhao D. Research on the Effects of Entrepreneurial Education and Entrepreneurial Self-Efficacy on College Students' Entrepreneurial Intention. Front Psychol. 2019 Apr 24;10:869. doi: 10.3389/fpsyg.2019.00869. PMID: 31068862; PMCID: PMC6491517.

Minniti, M., & Arenius, P. (2003). Women in Entrepreneurship.

Mirchandani, K. (1999). Feminist Insight on Gendered Work: New Directions in Research on Women and Entrepreneurship. *Gender, Work, and Organization*, *6*(4), 224–235.

Morelix, A. (2015, October 29). *The evolution of entrepreneurship on College Campuses*. Ewing Marion Kauffman Foundation Kauffmanorg. Retrieved September 24, 2022, from

https://www.kauffman.org/currents/the-evolution-of-entrepreneurship-on-college-campuses/

Morris, M. H., Miyasaki, N. N., Watters, C. E., & Coombes, S. M. (2006). The dilemma of growth: Understanding venture size choices of women entrepreneurs. *Journal of Small Business Management*, *44*(2), 221–244. https://doi.org/10.1111/j.1540-627x.2006.00165.x

N. A. (2020). *Digest of Education Statistics, 2020*. National Center for Education Statistics (NCES) Home Page, a part of the U.S. Department of Education. Retrieved September 25, 2022, from https://nces.ed.gov/programs/digest/d20/tables/dt20_317.10.asp?current=yes

N/A (2011). *The Thiel Fellowship*. The Thiel Fellowship. Retrieved September 24, 2022, from https://thielfellowship.org/

N/A. (n.d.). *About*. Gem Global Entrepreneurship Monitor. Retrieved September 17, 2022, from https://www.gemconsortium.org/about/gem/5

Niethammer, C. (2013). (issue brief). *Women, Entrepreneurship, and the Opportunity to Promote Development and Business* (pp. 1–10). Brookings Blum.

Schramm, C. J. (2008). (rep.). *Entrepreneurship in American Higher Education* (pp. 1–28). Kansas City, MO: Ewing Marion Kauffman Foundation.

Slavtchev, V., Laspita, S., & Patzelt, H. (2012). Effects of entrepreneurship education at universities. *Jena Economic Research Papers*.

Staff, T. P. R. (2014, September 15). *The oldest entrepreneurship programs in America.* Entrepreneur. Retrieved September 24, 2022, from

https://www.entrepreneur.com/leadership/the-oldest-entrepreneurship-programs-in-america/237387

Staff, T. P. R. (2021, December 1). *Top 50 best undergraduate programs for entrepreneurs in 2022*. Entrepreneur. Retrieved September 19, 2022, from https://www.entrepreneur.com/leadership/top-50-best-undergrad-programs-for-entrepreneurs-in-2022/391891

Top schools for entrepreneurship studies 2022 press release. Top Schools for Entrepreneurship Studies 2022 Press Release | Public Relations | The Princeton Review. (n.d.). Retrieved September 19, 2022, from https://www.princetonreview.com/press/top-entrepreneurial-press-release-2022

Toren, M. (2011). *Top 100 entrepreneurs who made millions without a college degree.* Business Insider. Retrieved September 28, 2022, from https://www.businessinsider.com/top-100-entrepreneurs-who-made-millions-without-a-college-degree-2011-1

Torrance, W. E. F., & Rauch, J. (n.d.). (rep.). *Entrepreneurship Education Comes of Age on Campus* (pp. 1–28). Kansas City, MO: Ewing Marion Kauffman Foundation.

U.S. Census Bureau. (2021, November 22). *About the survey: Annual Survey of Entrepreneurs.* Census.gov. Retrieved September 18, 2022, from https://www.census.gov/programs-surveys/ase/about.html

Wang, W., & Parker, K. (2019, December 31). *Iv. by the numbers: Gender, race, and Education.* Pew Research Center's Social & Demographic Trends Project. Retrieved September 29,

2022, from https://www.pewresearch.org/social-trends/2011/08/17/iv-by-the-numbers-gender-race-and-education/

Wei, X., Liu, X., & Sha, J. (2019). How does the entrepreneurship education influence the students' innovation? testing on the multiple mediation model. *Frontiers in Psychology*, *10*. https://doi.org/10.3389/fpsyg.2019.01557

Westhead, P., & Solesvik, M. Z. (2016). Entrepreneurship education and entrepreneurial intention: Do female students benefit? *International Small Business Journal*, *34*(8), 979–1003. https://doi.org/10.1177/0266242615612534

Winn, J. (2005). Women Entrepreneurs: Can We Remove the Barriers? *International Entrepreneurship and Management Journal*, *1*, 381–397.