XXIII SEMEAD
Seminários em Administração

novembro de 2020
ISSN 2177-3866

STEVE BLANK'S LEAN STARTUP ACCELERATION PROGRAM AS A METHOD TO TEACH ENTREPRENEURSHIP TO UNDERGRADUATE STUDENTS: THE EVOLUTION OF ENTREPRENEURIAL ORIENTATION, ATTITUDE TOWARDS ENTREPRENEURSHIP, ENTREP

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STEVE BLANK'S LEAN STARTUP ACCELERATION PROGRAM AS A METHOD TO TEACH ENTREPRENEURSHIP TO UNDERGRADUATE STUDENTS: THE EVOLUTION OF ENTREPRENEURIAL ORIENTATION, ATTITUDE TOWARDS ENTREPRENEURSHIP, ENTREPRENEURIAL INTENTION, AND ENTREPRENEURIAL EDUCATION

Summary

This study aims to measure and evaluate the progress of students participating in mixed teams of entrepreneurs and students participating in an innovative startup acceleration program developed by the professor Steve Blank at the Berkeley University based on customer development. The progress of the students was evaluated in terms of the evolution of these students regarding Entrepreneurial Orientation, Attitude Towards Entrepreneurship, Entrepreneurial Intention, and Entrepreneurial Education.

Key-words

Lean startups, business acceleration, teaching, entrepreneurship, innovation, entrepreneurial education, experimental learning

Introduction

The structuring of teams that seek to solve a problem or meet some market demand is a very current phenomenon. These newly formed teams are commonly called startups, since they have already identified a problem or demand that they believe to be important, but they do not yet have a validated business model and have no revenue generation, so they usually cannot yet be called companies themselves.

Once this team has identified this problem to be solved or this demand to be met, it is necessary for it to seek a scalable business model, which allows it to generate revenue and positive results, thus becoming a real company. It is precisely in these search processes for a scalable business model that the acceleration programs seek to focus, transforming years into months, hence the name acceleration.

These processes consist of proposing a model and subsequently validating it with the market. One of the main challenges in these processes is to check if there is a sufficiently large number of customers willing to pay for the services and products to be offered. This verification is usually called customer development.

During this process of searching and validating a scalable business model, startups are often forced to pivot one or more aspects of their business model, that is, to make changes to one or more aspects of it, such as market segmentation, in the channel , in the form of relationships, pricing and revenue sources, or even in the value proposition and offers. As you can see, success in this process can determine life, with the transformation into a company, or the death of the startup, with the team giving up and breaking up.

In this way, it can be seen that these acceleration programs, in addition to being extremely important for startups, consist of a very rich "laboratory", allowing for countless experiments and allowing for different learning opportunities, both for entrepreneurs and students who eventually come to participate in this process contributing to the journey of these teams.

However, despite its apparent importance, little is known about the real effectiveness of the startup acceleration processes as an instrument to assist in the evolution of business, even more so as to assist the learning of entrepreneurship students.

As for teaching entrepreneurship, it has been said that it can be done in three ways: 1) talking about entrepreneurship and its theories; 2) training for entrepreneurship, teaching techniques and tools, such as the elaboration of business plans and business modeling; 3) teaching through entrepreneurship, through an entrepreneurial experience in real life. It is this third option that was used in this experiment.

This study aims to assess the progress of students working in mixed teams of entrepreneurs and students participating in an accelerating program for innovative startups, to the learning of these students.

Objectives

The main objective of this study is to evaluate the benefits of using a company acceleration methodology focused on developing customers as a teaching method for the training of future entrepreneurs. More specifically, the objective is to evaluate the effectiveness of the proposed methodology in the evolution of the following dimensions:

- Entrepreneurial Orientation
- Attitude Towards Entrepreneurship
- Entrepreneurial Intention
- Entrepreneurial Education

Motivation

Currently, entrepreneurship and the creation of new companies are increasingly valued. Thus, the teaching of entrepreneurship, the incentive to create new innovative companies, as well as the support so that these companies can escape the high mortality rates that affect them in their first years of life and grow can become more and more important generating jobs and development for the regions where they originated.

Thus, it is understood that the proposed study is relevant, both academically and for society, since it seeks to focus on evaluating the effectiveness of a methodology used to teach entrepreneurship in practice with a hands-on approach while helping to accelerate innovative startups, increasing your chances of success.

Literature Review

Entrepreneurship has been treated with increasing interest worldwide (BASÇI and ALKAN, 2015). According to the study developed by Klapper et al. (2008) involving data from the World Bank of 84 countries, strong evidence can be identified in the relationship between entrepreneurship and the economic and financial development of nations.

Thus, promoting entrepreneurship has been a concern in many societies, and one of the ways to make this incentive is through education. However, the ability to evaluate the effectiveness of these education programs for entrepreneurship becomes important, both with students with great potential to become entrepreneurs and with people who have already made the decision to undertake.

Huber et al. (2012) speaks of the importance of entrepreneurial education for the development of a set of entrepreneurial skills, especially when it comes to education for children and adolescents. In this case, the author comments that entrepreneurial education has better results in the development of non-cognitive skills than cognitive skills. Similarly, Premand et al. (2016) also comes to similar conclusions, defending the use of entrepreneurial education to develop entrepreneurial skills.

Graevenitz et al. (2010) carried out a study to assess the impact of entrepreneurship education, using a learning model and trying to measure the impact of implementing this model on the development of entrepreneurial attitudes and skills through the use of questionnaires applied before and after learning. However, these authors comment on the scarcity of studies in this area until that date. Fortunately, since 2010 several studies have been developed focusing on the question of assessing the impacts of entrepreneurial education or education for entrepreneurship. In the present work we will use both expressions as having the same meaning.

Walter and Block (2016) carried out a study seeking to identify whether entrepreneurial education was correlated with the increase in entrepreneurial activity. The authors find a positive relationship, although it is stronger in environments less friendly to entrepreneurship, and weaker where environments are already friendly, leading to the inference that perhaps in less friendly environments, entrepreneurial education also helps more to motivate people who want to undertake but somehow do not feel safe to do so.

Several studies have identified that one of the main benefits of entrepreneurial education is the increase in the intention to undertake, on the part of the participants in these educational programs. Among them, Miranda et al. (2017), Barba-Sanches and Atienza-Sahuquillo (2017), Maresch et al. (2016), Stamboulis and Barlas (2014), Ben Nars and Boujelbene (2014), and Jensen et al. (2015). These studies, despite being developed in different countries (USA, India, Holland, Tunisia, Greece and Spain) and involving students from schools of management and engineering schools, find evidence that indicate a positive effect of entrepreneurial education in increasing intention to undertake by the students.

One of the most interesting ways of teaching entrepreneurship is "learn by doing", or "learning while doing", also called "experimental learning" or experimental learning. In this line, Gundlach and Zivnuska (2010) carried out a comparative study between teaching entrepreneurship in a traditional way through classes and teaching through practical experience and find evidence in favor of experimental learning to develop motivation for entrepreneurship.

On the other hand, evaluating the effects of entrepreneurial education on entrepreneurs, Eesley and Wu (2017) developed a study to evaluate the effects of an open and massive online course that has the support of mentors for the teams of entrepreneurs participating in the course. In this work, the authors were able to identify that the development of a strong business vision for the enterprise was important for motivation in the short term, but in the long run, the predominant factor was the support of the mentors, since they were able to help entrepreneurs to be more agile, adapt faster and better, and acquire the necessary resources for the success of the business, thanks to the social network (network) of these mentors.

Martin et al. (2013) in their study find evidence that the effects of entrepreneurial education are clearer in academic education than in training education. These results favor and are in line with the proposal of this research project, since here it is also proposed

Regarding the methodologies for evaluating the results and impacts of entrepreneurial education, McKenzie and Woodroff (2013) comment on several problems found in the methodologies of other studies. According to these authors, several studies suffer from problems such as insufficient samples, evaluation that involves only 1 year, problems with the questionnaires used, among others. Despite this, the authors recognize the benefits of entrepreneurial education, especially in terms of speed in launching new businesses.

Donnellon et al. (2014) speaks of the importance of entrepreneurial education for the construction of an entrepreneurial identity. According to the authors, in addition to knowledge and developing skills, it is also essential to develop an entrepreneurial identity. Entrepreneurial identity can be built through storytelling, symbols and positioning. In this line, the expected results of entrepreneurial education consist of an increase in the number of new businesses created and the development of an entrepreneurial behavior.

Harms (2015) developed a study involving learning for entrepreneurship involving team learning techniques and the lean-startup methodology, using a startups competition. Similarly, Guerra et al. (2015) presents some previous results of the use of a methodology funded and approved by the NSF (National Science Foundation) called I-Corps, which was developed by professor Steve Blank based on the concepts of lean statup (called by him the Lean LaunchPad). Although still in a preliminary form, the authors show great expectations for the final results of the initiative, due to the scalability and replicability of the methodology.

Finally, the work of Welsh et al. (2016) seeks to assess what is most important for entrepreneurial education, whether it is the process or the methodology. In this study, the authors conclude that although the methodology is important, the process is still more important. In this sense, this study corroborates the importance of using a practical learning approach, with the involvement of participants in practical activities of entrepreneurship, preferably in real projects.

Methodology

The methodology used consisted of the following steps. The first step was to structure the research instruments. The second step in identifying the study samples. The third step was data collection. The fourth step in the analysis of the collected data.

In the first step, that would be the structuring of research instruments and indicators to measure both the theoretical knowledge and entrepreneurial maturity of the participants. This was done both through previously defined questionnaires.

In the second step, the study samples were identified. At this point, the criteria for selecting the teams to compose the study sample were defined. The teams were formed by students who participated in the discipline process during the semester together with entrepreneurs developing real businesses.

In the third step, which was data collection, at the beginning of the semester questionnaires were applied and data were collected from students. At the end of each semester, the same procedures would be performed, so that the evolution of the evaluated parameters can be evaluated.

In the fourth step, the analysis of the collected data was carried out, in order to obtain insights about the collected data. In this step, statistical tests were performed using the collected data. Additionally, in the fifth step, a description of the analysis of the results found in the tests performed should be made.

Sample

The sample for this study were undergraduate business school students enrolled in an entrepreneurship related class. This class included, among other things, an real life experience of participating in an lean startup acceleration program based in customer development. In this program the students participated in teams formed by both students and real entrepreneurs that were developing real startups. Therefore, this experience becomes a real-life experience for the students, that would face the challenges, disappointments, and also realize some of the rewards that entrepreneurs do. In terms of subjects, there were 21 students responding the research instrument before the program and 24 responding after the program.

The Lean Startup Acceleration Program

The lean startup acceleration program was developed by professor Steve Blank at the University of California at Berkely, through an NSF funded research project called I-Corps. This project generated a business acceleration methodology that has being adopted by more than 50 universities across the world both the accelerated new businesses and also to teach students the craft of entrepreneurship through real life experience.

The program encompasses the following topics:

- Business Modelling
- Customer Development
- Customers as people and customer segments
- How to setup and perform interviews with customers
- Value Propositions
- Product-Market Fit
- Market types and market size (TAM, SAM, SOM)
- Acquisition, Retention, and Growth with Customers
- Cost of Acquisition, Life Time Value, and other lean startup metrics
- Channels for building awareness, supply information, allow purchase, delivery, and after sales
- Identifying revenue models and defining pricing strategies
- Key resources, activities, and partnerships
- Cost Structure
- Story-telling

Throughout the program the teams composed by students and entrepreneurs need to "get out of the building" and conduct ideally 100 interviews with customers in order to validate or invalidate and pivot the startup's business models. Once patterns begin to emerge and the business model assumption proves to be consistent across a large number of customers, the startup can be considered ready to move to the next level: go to market.

Research Instrument

In order to make it possible to evaluate the evolution of students regarding Entrepreneurial Orientation, Attitude Towards Entrepreneurship, Entrepreneurial Intention and Entrepreneurial Education, a few statements were defined as listed bellow. These dimensions and statements where defined according with the literature review presented earlier.

Entrepreneurial Orientation:

- I can make decisions in situations of uncertainty
- I feel comfortable exposing myself to calculated risks, as long as I am rewarded
- I am able to develop projects or activities that have a considerable chance of having a costly failure
- Creating a company is not too risky.
- I am open to new ideas
- I like to think creatively to create new products or processes
- I pursue creative or innovative solutions to my problems and challenges
- I am able to see or create opportunities
- I like to take the initiative whenever I can
- I take a strongly competitive stance towards my competitors
- I am able to devise strategies to explore market opportunities
- I would be willing to fight for an opportunity to have my own business
- I am good at making "predictions" or forming expectations about the future
- I feel competitive with other people to develop certain projects or activities
- I feel I have a high degree of independence to develop projects and activities
- I am comfortable working individually, even when making decisions under pressure
- I feel comfortable exposing my ideas to others and influencing them to follow them.
- I feel confident to talk to potential investors about business opportunities

Attitude Towards Entrepreneurship

- Having my own business can improve the life balance between work and leisure
- Entrepreneurs have a better lifestyle
- Being an entrepreneur implies having more advantages than disadvantages

Entrepreneurial Intention

- I am attracted to the idea of having my own business
- My professional goal is to become an entrepreneur
- After graduating I will work in my family's business
- After graduating I will set up my own business
- I already have my own business

Entrepreneurial Education

- The education I receive at the University has motivated me to create my own business
- The University has passed on technical knowledge (communication, organization, etc.) and business management (planning, decision-making, marketing, finance, etc.) important to prepare me to manage my own business or that of others
- The University has helped me to develop the personal characteristics necessary to undertake (personal control, proactivity, propensity to innovation, risk exposure, persistence, adaptability to changes, etc.)

Results

As it can be seen in the table 1 bellow, it could be observed a positive evolution in some of the statements, and a negative evolution in others. However, in order to evaluate the evolution in the aggregated dimensions, the responses obtained in for each statement were averaged according with the corresponding dimension it belongs to.

Statement	Before	After	Change
I'm good at making "predictions" or forming expectations about the future	3,19	4,04	0,85
I can see or create opportunities	3,86	3,88	0,02
I like to take the initiative whenever I can	4,33	4,12	(0,21)
I am open to new ideas	4,67	4,36	(0,31)
I like to think creatively to create new products or processes	4,14	4,04	(0,10)
I pursue creative or innovative solutions to my problems and challenges	3,90	3,84	(0,06)
I can make decisions in situations of uncertainty	3,81	3,84	0,03
I feel comfortable exposing myself to calculated risks, as long as I'm rewarded	4,05	3,68	(0,37)
I am able to develop projects or activities that have a considerable chance of having a costly failure	3,29	3,24	(0,05)
I feel competitive with other people to develop certain projects or activities	3,81	3,8	(0,01)
I take a strongly competitive stance towards my competitors	3,48	3,88	0,40
I feel I have a high degree of independence to develop projects and activities	3,71	3,76	0,05
I am comfortable working individually, even when making decisions under pressure	3,71	3,72	0,01
I feel comfortable exposing my ideas to others and influencing them to follow them.	3,67	3,88	0,21
I feel confident to talk to potential investors about business opportunities	3,10	3,4	0,30
I am able to devise strategies to explore market opportunities	3,38	3,64	0,26
I am attracted to the idea of having my own business	4,00	3,84	(0,16)
I would be willing to fight for an opportunity to have my own business	4,05	3,88	(0,17)
My professional goal is to become an entrepreneur	3,52	3,64	0,12
Having my own business can better balance life between work and leisure	3,52	3,68	0,16
Entrepreneurs have a better lifestyle	2,86	3,2	0,34
Being an entrepreneur means having more advantages than disadvantages	3,10	3,24	0,14
Starting a business is not too risky.	1,57	1,48	(0,09)
After graduating I will work in my family's business	1,76	1,6	(0,16)
After graduating I will set up my own business	3,38	3,28	(0,10)
I already have my own business	1,43	1,76	0,33
The education I receive at the University has motivated me to create my own business	2,86	3,44	0,58
The University has passed on technical knowledge (communication, organization, etc.) and business management (planning, decision making, marketing, finance, etc.) important to prepare me to manage my own business or that of others	2,95	3,84	0,89
The University has helped me to develop the personal characteristics necessary to undertake (personal control, proactivity, propensity to innovation, risk exposure, persistence, adaptability to changes, etc.)	2,90	3,48	0,58

Table 1 – Average answers for each statement before and after the program, followed by the absolute increase

Table 2 presents the results in each of the four dimensions, Entrepreneurial Orientation, Attitude Towards Entrepreneurship, Entrepreneurial Intention, and Entrepreneurial Education, both before and after the program. From the analysis of the data, some conclusions can be drawn.

First, Entrepreneurial Education before the program presents the lowest average and jumps to second highest average after the program. From that can be implied that the program possibly had a major impact in the perception of the students on the contribution of the course to their Entrepreneurial Education. The growth rate demonstrates a growth of 24% increase. That alone can be considered a great success for the methodology and the program.

Second, even though Attitude Towards Entrepreneurship presented the second highest average before the program, it presented the second highest growth rate, displaying a growth of 10%, which is also expressive. That means that the students increased their awareness about entrepreneurship, the entrepreneurial life, and the entrepreneurial perspective in terms of economic and social results after going through the program.

Third, despite the fact that Entrepreneurial Intention presented a small increase, it cannot be disregarded, taking in account that the level of this dimension as already considerably high, since an average of 2,82 in a scale between 1 to 5 means that at least half of the students already have a high propensity to act entrepreneurially at some point in their lives.

Fourth, Entrepreneurial Orientation presented no change on average. That is not surprising taking into account that the in a business school many students already have high levels of Entrepreneurial Orientation. Additionally, many aspects of the Entrepreneurial Orientation are related to personal characteristics that my not easily change over a 8 weeks lean startup program.

	Before	After	Change	Growth
Orientation	3,74	3,74	(0,00)	0%
Attitude	3,16	3,47	0,31	10%
Intention	2,82	2,89	0,07	3%
Education	2,90	3,60	0,69	24%

Table 2 – Average results per dimension before and after the program

Tables 3 shows the correlation between dimensions before the program. It can be noticed that the highest levels of correlation can be observed between Orientation & Intention, and Attitude & Intention. That could be possibly explained by the fact that before the course, the students raked higher in Entrepreneurial Orientation and in Attitude Towards Entrepreneurship displayed higher Entrepreneurial Intention.

	Orientation	Attitude	Intention	Education
Orientation		0,37	0,49	0,10
Attitude			0,48	0,39
Intention				0,31
Education				

Table 3 - Correlation matrix before the program

Tables 4 shows the correlation between dimensions after the program. It can be noticed that the highest levels of correlation can be observed between Orientation & Intention, and Orientation & Education. That could be possibly explained by the fact that after the course, the students raked higher in Entrepreneurial Orientation continue to display higher Entrepreneurial Intention. Additionally, these students also started to have a higher perception that the university was contributing to their Entrepreneurial Education. This is highly positive to the university, since these entrepreneurial students probably will be considered the ones to give the most valuable and trustworthy feedback to the ecosystem about the contribution of the university to their Entrepreneurial Education.

	Orientation	Attitude	Intention	Education
Orientation		0,32	0,51	0,44
Attitude			0,27	0,07
Intention				0,31
Education				

Table 4 - Correlation matrix after the program

Conclusion

The use a hands-on, practical experience working in a team with real entrepreneurs going through an lean startup acceleration program seems to be an interesting strategy to impact undergraduate business school students in relation to entrepreneurship. More specifically, the program seemed to show good results towards enhancing the Attitude Towards Entrepreneurship, Entrepreneurial Intention, and the perception about Entrepreneurial Education. As presented in the body of this work, Entrepreneurial Orientation did not seem to be affected by the 8 weeks lean startup program, in a highly entrepreneurial environment as the business school.

Even though the results seem promising, this research has several shortcomings. First, the results could greatly benefit if the number of subjects were to increase. Second, to achieve more robust results, the data collection could be repeated in different editions of the program. Third, a more thorough statistical analysis of the results could be carried out. All of these shortcomings could be overcome in future research efforts.

Another opportunity for future research is to encompass the lean startup phases that come before and after the customer development, namely idea generation and go to market, respectively. Both of these phases are equally important in the new startup development and launching process and might also have a great impact on undergraduate students in relation to their Entrepreneurial Orientation, Attitude Towards Entrepreneurship, Entrepreneurial Intention, and Entrepreneurial Education.

In any account, inspiring, motivating, training and preparing new entrepreneurs is a field of great importance and with a large demand for knowledge, tools, and methods. Even though the present work attempted to give a small contribution to this field, there still a vast space and demand for new research to bring light to such a relevant issue the economic development of countries and societies.

References

Barba-Sánchez, V., e Atienza-Sahuquillo, C. Entrepreneurial intention among engineering students: The role of entrepreneurship education. European Research on Management and Business Economics. Volume 24, Issue 1, 2018.

Başçı, E., e Alkan, R. Entrepreneurship Education at Universities: Suggestion for a Model Using Financial Support. Procedia - Social and Behavioral Sciences. Volume 195, 2015.

Donnellon, A., Ollila, S. e Middleton, K. Constructing entrepreneurial identity in entrepreneurship education. The International Journal of Management Education. Volume 12, Issue 3, 2014.

Eesley, C. e Wu, L. Entrepreneurial Adaptation and Social Networks: Evidence from a Randomized Experiment on a MOOC Platform. Working Paper da Universidade de Stanford. 2017.

Graevenitz, G., Harhoff, D. e Weber, R. The effects of entrepreneurship education. Journal of Economic Behavior & Organization. Elsevier. Outubro, 2010.

Guerra, R., Smith, K., McKenna, A., Swan, C., Korte, R., Jordan, S., Macneal, R. Innovation corps for learning: Evidence-based entrepreneurship™ to improve (STEM) education. In Proceedings - Frontiers in Education Conference, FIE. Fevereiro, 2015.

Gundlach, M. e S. Zivnuska, S. An Experiential Learning Approach to Teaching Social Entrepreneurship, Triple Bottom Line, and Sustainability. American Journal of Business Education 3 (1): 19–28, 2010.

Harms, R. Self-regulated learning, team learning and project performance in entrepreneurship education: Learning in a lean startup environment. Technological Forecasting and Social Change. Novembro, 2015.

Huber, L., Sloof, R., e Van Praag, M. The Effect of Early Entrepreneurship Education: Evidence from a Randomized Field Experiment. Discussion Paper 6512, Institute for the Study of Labour, Bonn, Germany. 2012.

Jansen,S., Van de Zande, T., Brinkkemper, S., Stam, E. e Varma, V. How education, stimulation, and incubation encourage student entrepreneurship: Observations from MIT, IIIT, and Utrecht University. The International Journal of Management Education. Volume 13, Issue 2, 2015.

Klapper, L., Amit, R., Guillen, M., e Quesada, J. Entrepreneurship and Firm Formation across Countries. In International Differences in Entrepreneurship, edited by J. Lerner and A. Schoar. Chicago, IL: The University of Chicago Press. 2010.

Maresch, D., Harms, R., Kailer, K., e Wimmer-Wurm, B. The impact of entrepreneurship education on the entrepreneurial intention of students in science and engineering versus business studies university programs. Technological Forecasting and Social Change. Volume 104, 2016.

Martin, B., McNally, J. e Kay, M. Examining the Formation of Human Capital in Entrepreneurship: A Meta-Analysis of Entrepreneurship Education Outcomes. Journal of Business Venturing 28 (2). 2013.

McKenzie, D. e Woodruff, C. What are we Learning from Business Training and Entrepreneurship Evaluations around the Developing World? Reviews evaluations of business training programs in developing countries.World Bank (2012).

Miranda, F., Chamorro-Mera, A. e Rubio, S. Academic entrepreneurship in Spanish universities: An analysis of the determinants of entrepreneurial intention. European Research on Management and Business Economics. Volume 23, Issue 2, 2017.

Nasr, K. e Boujelbene, Y. Assessing the Impact of Entrepreneurship Education. Procedia - Social and Behavioral Sciences. Volume 109, 2014.

Premand, P., Brodmann, S., Almeida, R., Grun, R., Barouni, M. Entrepreneurship Education and Entry into Self-Employment Among University Graduates. World Development. Volume 77, 2016.

Stamboulis, Y. e Barlas, A. Entrepreneurship education impact on student attitudes. The International Journal of Management Education. Volume 12, Issue 3, 2014.

Valerio, A., Parton, B., e Robb,A. Entrepreneurship Training and Education Programs around the World. Broad overview of entrepreneurship training programs and academic impact evaluation studies. World Bank, 2014.

Walter, S., Block, J. Outcomes of entrepreneurship education: An institutional perspective. Journal of Business Venturing. Volume 31, Issue 2, 2016.

Welsh, D., Tullar, W., Nemati, H. Entrepreneurship education: Process, method, or both? Journal of Innovation & Knowledge. Volume 1, Issue 3, 2016.