EFFECTS OF TEACHING AND TEAM COMPOSITION ON SUCCESS IN AN ENTREPRENEURSHIP EDUCATION COURSE

CHRISTIAN SCHULTZ
TAMARA ALMEYDA
KATHARINA HÖLZLE

Abstract

We analyse the effects of teaching and team composition on the success of student teams who attended the course "Entrepreneurship and Business Plan" in the period 2007-2011 at the University of Potsdam and participated in a popular business plan competition. External jurors rank the business plans in three different stages of the competition. Each stage focuses on different aspects of the overall plan e.g. business idea or market analysis.

A logistic regression model is performed to calculate the effects. While no effect of team composition is found either in the case of service- and technology-oriented business plans the contextual variable course focus emerges as highly significant to predict the rank bracket of the participating teams.

Different implications of the findings are discussed and avenues for future research are framed.

1. PRINCIPLE TOPIC

Innovation and entrepreneurship have emerged as important topics on the political and academic agenda. They have been identified as key factors for economic growth in small and medium enterprises. Government initiatives have been formed to promote and support entrepreneurship and entrepreneurial education. In Germany the federal Ministry of Economics and Technology supports the EXIST program "aimed at improving the entrepreneurial environment at universities and research institutions and at increasing the number of technology and knowledge based business start-ups" (EXIST 2012). Some researchers emphasize that individual personality and talent make a successful entrepreneur and that technique-based training, i.e. entrepreneurial education can only teach skills and provide tools that may help the entrepreneur but won´t make a mayor differences in success (Thompson 2004). But the majority of scholars and researchers in the field of entrepreneurial education state that both the characteristics and skills of entrepreneurship can be trained or learned and that subsequently „the question of whether entrepreneurship can be taught is *obsolete*" (Kuratko 2005, 580).

Business plan courses and business plan competitions have emerged as an extraordinarily popular part of the entrepreneurship education curriculum in higher education institutions (Honig 2004; Kuratko 2005; Russell et al. 2008; Müller 2011). Business plan competitions although originally aimed at stimulating start-up activities have been recognized to provide a range of benefits to participants, such as the access to mentors, access to workshops and events such as team building or networking and judges' advice. On the educational level an increase of both general economic as well as entrepreneurship specific knowledge has been generally observed in the curricula (Russell et al. 2008). Another benefit for participants is the development of social skills such as team competences, confidence in dealing with risks, problem solving or dealing with pressure (Russell et al. 2008). The combination of these different learning objectives, entrepreneurial spirit, economic knowledge and social skills, is both a challenge and a great opportunity to business plan courses. So in translating their theoretical knowledge to a hands-on experience such as the creation of a business plan, participants might gain valuable knowledge and skills. These benefits prevail despite the fact that the importance of a business plan from the decision-making process of venture capitalists is sometimes challenged (Kirsch et al. 2009) and participants of business plan courses or competitions at the university level might not immediately decide to start their own businesses.

On the institutional level of academic education business plan courses are cross-disciplinary courses, combining the knowledge of different business school disciplines such as marketing and management in one course (Bowers and Scherpereel 2008). The goal is to translate

an idea into a business plan, that is „to understand and fill the gaps between their idea and a commercially viable business plan [and to understand] the knowledge gap between their idea and a judge's or the market's view of a business plan" (Russell et al. 2008, 127). To enhance the inclusion of the market perspective, the University of Potsdam has opted to combine the business plan course in the curriculum with the regional business plan competition Berlin-Brandenburg.

The business plan course at the University of Potsdam is designed as an elective for undergraduate business school students. It is open to undergraduate and graduate students of all other departments of the university. Students attend lectures on the components of a business plan by faculty members and guest speakers. Every participant has to develop a business idea throughout the semester, either on his own or in a team. It is obligatory that everybody participates in the Business Plan Competition Berlin-Brandenburg (BPW). The accompanying lecture is aligned to the 3 milestones of the BPW, which are described in more detail in the next section.

The course design combines a number of different teaching methods. The course starts with introductory classes on entrepreneurship and business idea generation followed by a "Market of Ideas" where idea posters for the potential businesses are presented to fellow students and faculty members. Students may revise their business ideas based on the early feedback they received before starting the business plan process. During the semester students attend lectures on the components of a business plan by faculty members and guest speakers. There are also three peer review sessions with fellow student tutors or faculty members prior to submitting the business plan documents. The business plans are graded at the university and simultaneously ranked and feedback is given by the jurors of the BPW. So while students can earn credit they also get feedback from outside the academic world.

The course´s goal depend on the target group – whether they are business students or a non-business audience with presumably fewer knowledge of market evaluation, business processes, marketing and finance. For business students it is more relevant to practice knowledge acquired in different courses during their studies and apply those to an original idea. Students of other university-departments are in a greater need of basic business-related knowledge to develop an idea in a marketable business.

An important factor in the process of composing a business plan is team diversity (Sanjib 2005; Der Foo et al. 2005). Der Foo et al. (2005) argue that task related diversity of team members might enhance team effectiveness, while non-task diversity such as age might have negative effects. Sanjib (2005) also include the gender perspective and find that demographic diversity is not important for an entrepreneurial team. With the emergence of entrepreneurial

education specifically aimed at women (e.g. the Plan B(usiness) at the Technical University of Berlin or simulation games funded by the EXIST program), the gender component of entrepreneurial teams is in the focus of university level education.

After outlining the principle topic the basic research question arises, what determines the success of the business plans?

The described setting enables the study of two influencing factors on the quality of the business plan first the team composition and second the impact of the presented content to the students.

2. METHODOLOGY

The sample consists of 256 participating teams (technology: 49, service: 121) and single persons (technology: 16, service: 70) in the BPW in the period 2007-2011, who attended the course "Entrepreneurship and Business Plan" at the University of Potsdam.

The BPW is by far the largest public business plan competition in Germany. Regularly more than 3.000 persons in about 600 teams participate in this competition and turn in their business plans. The BPW is divided into the two sub segments *service* and *technology*. In the first the service-oriented business ideas are evaluated and in the second the more technology-oriented.

A distinct document outline is obligatory to participate in the BPW (1. Executive Summary, 2. Business Idea, 3. Team, 4. Market Analysis, 5. Marketing, 6. Legal Issues and 7. Finance). Starting in October of each year the competition is divided in 3 milestones, which require the delivery of specific parts of the business plan (1st Phase: 1-3; 2nd : 1-5; 3rd Phase: 1-7). Two anonymous referees evaluate the documents on a standardized point scheme and also qualitative feedback is provided. According to the (cumulative) points reached in each step the teams are ranked and the best10 participants win up to 10.000€.

Model and Variables

The dependent variable is the rank range of the teams in the BPW. For this purpose we coded the ranks in winner (Rank: 1-50), good, bad and loser. We choose different rank codes for the segments technology and service because a larger proportion of teams is located in the service sector than in the technology sector. For both segments a different ranking is published.

We include two independent variables in our overall model, one individual and two contextual. In the course every participant can choose if he wants to turn in a business plan by himself or if he wants to join a team with up to 3 persons.

We add to the model a contextual independent variable the phase (categorical: 1, 2, 3) and the team composition (categorical: 1, 2, 3, 4, 5)

The used dependent and independent variables are summarized in table 1 below.

I. Dependent Variables	
Name	Rank (service, technology)
Winner	1-50 (service), 1-10 (technology)
Good	50-140 (service), 20-45 (technology)
Bad	141-219 (service), 46-75(technology)
Loser	220-500 (service), 76-300 (technology9
II. Independent Variables	
A. Team Composition	
Name	Description
A	Team mixed
B	Team, strictly male
C	Team, strictly female
D	Women, single
E	Man, single
B. Course Focus	
Name	Description
Creativity	1st stage of BPW, focused on the business idea
Market	2nd stage of BPW, focused on business idea and market analysis
Final	3rd stage of BPW, complete business plan

Table 1: Dependent and independent Variables

In order to examine the group differences with existing independent variables, on principle the discrimination analysis and the logistic regression can be used as quantitative statistical procedures. In general, the logistic regression is considered as the more robust method because of less stringent conditions. No normally distributed independent variables and equal variance-covariance matrices are required (Backhaus 2010; Brosius 2004). Altogether, in the case of service 191 observations have been included in the regression calculation. For assessing the quality of the comprehensive model, three pseudo-r-square measures are available. The Cox and Snell amount to ,213, Nagelkerke to ,231 and McFadden R^2 to ,093. The Cox and Snell is considered as good for values bigger than ,40 the Nagelkerke value is to be interpreted also as good from ,40 and as very good from ,50 the McFaddens R^2 is considered as acceptable from values bigger than ,20 and as good from ,40.

According to all represented common measurements, all in all the comprehensive model shows goodness of fit ranging between rather poor and bad. The likelihood-ratio test determines the significance of the model and tests the assignability of the results to the main unit (see Table 3). The significance of the used independent variables varies. The aspired significance level of ≤

1% is reached for the area of course focus while team composition doesn´t show the slightest significance.

	Likelihood-Ratio Test			
Effect	-2 Log-Likelihood for reduced model	Chi-squared	df.	Sig.
Constant Term	94,856[a]	,000	0	.
Team Composition	99,934	5,078	12	,955
Course Focus	133,778	38,921	6	,000

Table 1: Likelihood-Ratio Test, Service

Altogether, in the case of technology-oriented business plans 65 observations have been included in the regression calculation. The Cox and Snell reaches ,484, Nagelkerke to ,516 and McFadden R^2 to ,239. In contrast to the service model these indicators show a general good model fit. The likelihood-ratio test shows (Table 4) that team composition although not statistically significant is by far more promising than in the first model while "course" focus is significant.

	Likelihood-Ratio Test			
Effect	-2 Log-Likelihood for reduced model	Chi-squared	df.	Sig.
Constant Term	56,664	,000	0	.
Team Composition	70,612	13,949	12	,304
Course Focus	85,581	28,917	6	,000

Table 4: Likelihood-ratio test, technology

In conclusion, the results of the classification matrix can be used for the assessment of the overall quality of the model (see Table 4). Here, for each group the lines show the observed group belonging and the columns the estimated group belonging. For Group A, the success rate of the prognosis amounts to 52.3%, for Group B 56.1% and for Group C 52%. All in all, 61% of the observations have been correctly classified. This value can be interpreted in its quality when one compares it with the hit rate of a random distribution taking into account the group volumes. The groups consist of 15 (Group A), 18 (Group B) and 16 (Group C) 16 observations (altogether: 65 observations). The result is an incidental hit rate of 27,69%. The model results in a rate of correct classifications of 52,3% which is about 88,87% better than the incidental hit rate.

Observed		Valid				
		Winner	Good	Bad	Loser	**Total**
	Winner	9	2	3	1	60,0%
	Good	3	9	2	4	50,0%
	Bad	3	7	5	1	31,2%
	Loser	3	2	0	11	68,8%
	Total	27,7%	30,8%	15,4%	26,2%	52,3%

Table 5: Classification matrix, technology

To look in more detail how the team ranks in the different course stages differ, we use simple cross tables. Table 6 shows the ranks in the technology area and it gets clear that in the course of the competition the placements improve. While about 50% of the teams place as "Loser" in the "Creativity" segment, in the following stages ("Market" and "Final") no team gets ranked in this bracket. Just as the proportion of better placed teams ("Winner" and "Good" column) rises in the 2nd and 3rd stage.

		Rank				
		Winner	Good	Bad	Loser	Total
Course Focus	Creativity	5	7	4	16	32
	Market	7	8	9	0	24
	Final	3	3	3	0	9
	Total	15	18	16	16	65

Table 6: Cross table, technology

In the service segment a different situation exists (table 7). While also about 50% of the teams place as "Loser" in the "Creativity" segment in the following stages the rank improvement isn´t as large as in the technology segment. In the "Market" stage still 12,1% place as "Loser" and about 48,5% as "Bad."

		Rank				
		Winner	Good	Bad	Loser	**Total**
Course Focus	Creativity	10	12	36	57	115
	Market	10	16	32	8	66
	Final	3	4	3	0	10
	Total	23	32	71	65	191

Table 7: Cross table, service

3. RESULTS AND IMPLICATIONS

Overall the contextual variable *course focus* has a significant impact on the success of the observed business plans while team composition does not have a significant impact either on the service or the technology segment. In the case of the technology segment there are hints through the likelihood-ratio test that team composition might have an impact on the dependent variable but nevertheless a relationship isn´t proven. From a theoretical perspective it makes sense that in a technology context where the business model is innovative and R&D has to be conducted that the start-up team has a (larger) impact on success than in the service segment where the business model is rather proven and the context variables are considerably more important than the individual team composition.

Overall, the empirical result might seem contradictory to those who interpret entrepreneurship as a highly individual process where the team is of uttermost importance for the outcome. While this holds true in the "real" business world for the controlled environment of a business plan competition this doesn´t seem to be the case. Another interpretation is, that a typology of teams according to number (team or single) and gender (male, female, mixed) just cannot capture the influencing factors like capacities, resources work experience and networks which are independent from sex or team characteristics.

We can derive from the cross tables that the rankings are improving throughout the course of the competition. While in the first stage, where participants have to creatively develop a business idea their ranks are considerably lower than in comparison to the following stages of the competition, where more and more hard facts e.g. market analysis and financial planning are focused. Some critics might consider this effect some kind of a self-fulfilling prophecy, because academics, who receive a special training to develop business plans might certainly do well or considerably better in comparison to non-academics in a business plan competition. In retrospective this might seem as a simple fact but you could also argue that practical experience is more relevant to success in a practice-oriented competition.

There is obviously potential to improve the effectiveness of the creative development of a business idea in the analysed course. By increasing the use of traditional creativity techniques and the more innovative approach of design thinking the observable results might advance.

In future research the presented research design offers the opportunity to study effects of changes in the course content on success. Through an accompanying questionnaire it will be possible to gather more meaningful data on the capabilities and character of the participating students and to use more independent variables for the proposed model. Especially those teams who combine high formal education and practical experience might place considerably better than teams with strictly theoretical knowledge.

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