



**NTNU – Trondheim**  
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# The Effect of Business Plan Competitions on Entrepreneurial Intention and Behavior

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## **Problem Description**

The purpose of this thesis is to gain a better understanding of the effects of business plan competitions and the way they may be a suitable means to enhance entrepreneurship education.

The students will conduct a cross-sectional, explanatory, quantitative study of former Venture Cup participants, as well as of a control group, to explore the effects of participation.

Assignment given: January 11th. 2012

Supervisor: Associate Professor Lars Øystein Widding, IØT, NTNU



## Preface

This master's thesis constitutes the end of the two authors' Masters of Science in Industrial Economics and Technology Management at the Norwegian University of Science and Technology. More specifically is the thesis the final report in the subject TIØ4945 – Innovation and Entrepreneurship, Master Thesis.

Above all, the authors wish to extend gratitude to their supervisor, Associate Professor Lars Øystein Widding at the Department of Industrial Economics and Technology Management, whose support and input were invaluable to the completion of this thesis.

Furthermore, thanks go to Sigmund Waagø for his help in creating the questionnaire, to Lillian Waagø for her contribution in discussing the essence of the thesis, to Øyvind Bjørgum for aiding the authors in analyzing the data, to Magnus Hakvåg for contributing with information about Venture Cup, to Kirsti Jensen for her point of views when choosing research questions, to Lars Kolvereid for helping the authors in their search for literature and providing constructive criticism, and to Vegar Johansen for his paper being a great source of inspiration to the questionnaire.

Last, thanks go to all the respondents to the questionnaires sent out, whose contribution to the empirical part of this thesis has been essential.

The authors would like to add that results from this study has been used in the paper “Nationwide Venture Cup Initiative” by Waagø, Myraune, Bjørkøy and Hakvåg, as well as being presented to relevant actors in governing bodies, such as Innovation Norway and Virke.

All errors in this paper are solely the responsibility of the authors.

Trondheim, June 8th, 2012.

Atle Myhrer

Jonas Berger



## **Abstract**

In order to make the reader prepared for the two papers, this document opens with the most used theory on intentions and behavior. It then touches upon business plans in education, and competitions in making such, as this is a theme in both papers as well. The document ends with a merger of the two models developed in the respective papers.

Paper one tests the self-efficacy part of the theory of planned behavior, for which the paper finds empirical support. The results show that self-efficacy has a greater correlation with behavior than intentions do. Further, it is found that self-efficacy is increased through participation in business plan competitions, and that this affects the self-efficacy of women more than that of men. Learning institutions and governments should, as a result, focus more on self-efficacy by introducing more and better business plan competitions. Further, adapting these to better fit the needs of women will contribute to fully utilizing the entrepreneurial potential, spurring more economic growth.

Paper two explores the relation between learning obtained during Venture Cup and the increase in entrepreneurial intention and involvement. The findings suggest a difference in the effect the various learning modules have on entrepreneurial intention, providing implications for both practitioners and future studies. The implications for the former are an open-ended contingency model for organizing business plan courses in a more dynamic manner. Our contribution to this model is a differentiation of the learning modules. In addition, this study contributes to expand the theory of planned behavior by adding an additional predictor; the learning effect obtained during a business course.





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### **Paper 1**

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# 1. Introduction

Entrepreneurship is key in the competitive, global world we are living in. It has several positive implications for the society (Shane & Venkataraman, 2000), and promoting it has been set as a priority for the Council of the European Union (“Entrepreneurship in Higher Education,” 2009). In addition, more than ever before, students have a stronger preference for becoming self-employed than for organizational employment (Kolvereid, 1996a; Lüthje & Franke, 2003).

One result of this growing importance of entrepreneurship may be seen in the increased attention devoted to this field within education. Governments seeking innovation and economic growth are strengthening their emphasis on entrepreneurship education (Russell, Atchison, & Brooks, 2008). Yet, attempts to clarify the effects of this form of education have not produced conclusive results (Wilson, Kickul, & Marlino, 2007).

It has been suggested that a goal of entrepreneurship education should be increasing the self-efficacy of the students (Chen, Greene, & Crick, 1998). Although some results are contradicting (Degeorge & Fayolle, 2008), self-efficacy has been found as an important antecedent of both entrepreneurial intentions and behavior (Chen et al., 1998; L Kolvereid, 1996b; Lüthje & Franke, 2003; Shane & Venkataraman, 2000; Souitaris, Zerbinati, & Al-Laham, 2007a). Yet, little research has been conducted to explore practical ways to enhance this complex construct (Gist & Mitchell, 1992).

Developing a business plan is one of the most common approaches to teach entrepreneurship, and it could include some of the antecedents of self-efficacy. The authors of this thesis wish to investigate the effects of business plan competitions, and examine which parts of these contribute the most to increased intentions and behavior.

Paper one looks more closely the effects of self-efficacy in entrepreneurship. It also studies the concept of business plan competitions and how gender differences are made visible through participation in these. Paper two explores the various parts of business plan competitions and how their influence on entrepreneurial intention and involvement differ. Together, the two papers propose additions and modifications to the theory of planned behavior.

This document starts by describing our point of departure and the backdrop for the motivation to conduct this study. Thereafter we present the theory of planned behavior, which serves as the theoretical framework for both papers. Next, we introduce and describe business plan competitions in detail, making the reader better equipped to take on the case in question. This is followed by the methodology that has been made use of. In the second to last section the

aim and main findings of both papers are presented in summarized form. Finally, we conclude and offer the final implications of the thesis.

## **2. Motivation for Study**

The basis for this master's thesis was laid during the fall of 2011, when Jonas Berger was working on his project thesis "The Learning Process of Participation in Business Plan Competitions", which included interviews of former winners of Venture Cup (VC) Mid-Norway. Fellow student Atle Myhrer caught interest in the topic, and the two of us started discussing a possible cooperation. After discovering an action plan from the Norwegian government on entrepreneurship education, and noticing that business plan competitions were not mentioned with a single word, it became apparent to us that this was something that could be worth exploring. Moreover, when we realized that very little research had been conducted on the outcomes of business plan competitions with respect to knowledge and skills acquired, entrepreneurial intentions and behavior, we got further convinced that using data from VC provided an opportunity to make a contribution as the competition have had hundreds of participants over the years.

We initiated talks with staff at NTNU Entrepreneurship Center (NEC) to investigate the possibility of gathering data from former participants of the competition to make use of. After a couple of meetings, we decided to create a quantitative survey aimed at those who had competed in VC. Through gathering data and thus providing empirical evidence of the learning outcomes, NEC would be able to better justify the importance of the event, and get a better understanding of how to make improvements. We knew that conducting this a study would have to be of a cross-sectional design because of the limited time at our disposal, and that an explanatory approach was needed in order to address the aims of the thesis.





### **3. The Theory of Planned Behavior**

Fishbein (1967) was the first to include several factors into the same theory of the predictive power of attitudes on behavior in a systematic order (Wicker, 1969). He argued that there are three variables that together determine behavior through intentions; attitudes toward the behavior, willingness to comply with the norms, and normative beliefs, with their respective importance depending on the behavior and person in question. This theory became the basis of Ajzen and Fishbein's theory of reasoned action (1974), which basically integrated the concepts of normative beliefs and willingness to comply into one, subjective norm, and this theory later led to Ajzen's theory of planned behavior (TPB) (1991). What was new in the TPB was an additional of a third construct, perceived behavioral control, and is today the most acknowledged model within the field of predicting behaviors (Courneya & McAuley, 1995; Sheeran & Abraham, 2003).

The TPB involves three beliefs; behavioral, normative and control, which respectively are measured through three constructs (Ajzen, 1991). Attitude toward the behavior indicates an individual's favorable or unfavorable evaluation of the specific behavior. These assessments include affective as well as evaluative considerations. Subjective norm refers to the perceived pressure from significant others to perform or not perform the behavior. Within this construct, normative beliefs describe how important persons or groups will approve of or reject a certain behavior, while willingness to comply concerns how the individual is willing to conform to these norms (Iakovleva, Kolvereid, & Stephan, 2011). The construct of perceived behavioral control deals with control beliefs, and involves the presence or absence of opportunities and resources needed to perform the behavior. It is thus a measure of how one perceives the ease or difficulty in performing a behavior, and the more resources and opportunities an individual possesses, and the less obstacles stand in the way, the higher should the perceived behavioral control be (Ajzen, 1991).

Ajzen (1991) noted that although it can be reasonably argued that one could make a simpler model by integrating all beliefs under a single summation, this would not be favorable, as it would blur interesting distinctions. He was, on the other hand, open to the inclusion of additional factors as long as they provide a greater prediction of intention or behavior.

The TPB can also serve as a framework for measuring the effect of entrepreneurial education, in which goals may include increased entrepreneurial intention or involvement. By having clearly defined constructs, such as the antecedents to behavior, it is possible to measure the effect a given entrepreneurial course has on its students. Hence, with TPB as a backdrop, we wanted to study the effect of the largest Norwegian entrepreneurial program in higher education, VC (NEC & Start Norway, 2012).



## **4. An Introduction to Business Plan Competitions**

As both papers use a single-case design based on the business plan competition VC this document provides an introduction into the domain of such competitions. Hopefully, this will help the reader to gain an insight into the characteristics of these competitions, enabling a better understanding of the subsequent papers.

Courses in entrepreneurship are offered at practically every U.S. business college, and the writing of a business plan has been found the most important part therein (Karlsson, 2005). One result is annual business plan competitions being held at many of the most prestigious universities in the world, including Harvard, Stanford and MIT (Karlsson & Honig, 2009), in addition to consulting firms like Ernst & Young and McKinsey introducing their own competitions (Karlsson, 2005). The popularity of the competitions has become so high that many universities send their best teams abroad to compete in a similar manner to that of their athletic teams (Honig, 2004). Bowers, College, Bowers and Ivan (2006) studied American academically based entrepreneurship centers, and found that 70% of these hosted business plan competitions, and 45% used awards gained through participation in such events as a measure of success.

When Venture Labs Investment Competition (formerly Moot Corp, hereinafter called “VLIC”) started at The University of Texas at Austin in 1984, it was the first business plan competition that targeted new organizations (Karlsson, 2005). VLIC became so popular that by 1989 the model had spread to several prestigious U.S. universities, and it inspired the first competition held in Germany. It was called “the Super Bowl of world business plan competition” by “BusinessWeek” (Wyatt, 2003), and can, because of its great influence, be used as a benchmark for other competitions (Russell et al., 2008).

### **Venture Cup**

Venture Cup (VC) is an annual business plan competition started in 1998 by McKinsey with a goal to promote entrepreneurship within the society as well as in the academic setting. It was first introduced in Sweden, but was soon expanded to include Denmark, Finland and Norway. A third of the business plans in VC Sweden have turned into sustainable businesses, including Lensway; the largest online provider of contact lenses in Europe (NEC & Start Norway, 2012). Today, the competition is the largest of its kind in the world (Hedner, Edgar, & Cowrick, 2011).

In 2004, four years after the first VC was arranged in Norway, Start Norway, a volunteer student organization, took over the responsibility of the organizing of the event. The main mission statement of the competition is to broaden the interest and knowledge about

entrepreneurship for students, regardless of field of study. To be eligible for the competition, a team must include at least one full time student at a Norwegian institute of higher education.

VC in Norway is divided into five regions: North, Mid, South West, East and Oslo. Each of these have several sub-branches which all are affiliated with a learning institution. One element that distinguishes VC from some business plan competitions is that it offers schooling in entrepreneurship and business planning, and VC Mid-Norway even offers 7.5 credits for participating in the competition. However, the educational program varies from institution to institution. While the business plan competition itself is the center of attention in most regions, VC Mid-Norway is the sole region utilizing pedagogical tools to teach entrepreneurship, focusing more on the development of entrepreneurial skills. This may be reflected through its four main elements; education, counseling, inspiration and competition.

There are three phases in VC Norway. The first phase is a local, elective stage, where participating teams hand in their business idea that has to answer a certain set of questions. As the first phase is optional, all contestants are qualified for the next phase. Phase 2 is a mandatory, regional stage, which requires the delivering of a business plan according to various criteria. All the teams from the first phase, in addition to the ones who entered in the second phase, will then compete against one another in order to determine which two teams will advance to the third and final phase that encompasses all five regions.

The local phase in Trondheim includes three institutions, one of which is the Norwegian University of Science and Technology (NTNU), while the regional VC Mid-Norway includes three additional institutions. What differs these from the rest of the local and regional phases is the anchoring within the faculty staff of NTNU, more specifically through NEC. Their work is the main reason for the credits offered for participation in the region, and is also responsible for the inclusion of mentors giving the contestants valuable feedback throughout the process. Mentors may include individuals from the industry, incubators or research parks, who are experts within various fields such as finance, marketing and patent registration. These individuals also guide the participants with their budgets, time management and action plans. In addition to this, the participants have four long sessions at the beginning of the semester. These sessions involve a total of approximately 20 hours of lectures, and give the participants at an early stage relevant theory for writing a business plan. After each stage, the teams receive a thorough evaluation of their final business plans done by experts. During the course, the students are given lectures about these topics, starting with the structuring of the business plan and ending with a lecture about investment presentation. Students may also learn from each other, as many teams consist of students with interdisciplinary backgrounds. Grouped together, these learning sources are coined *learning modules*, for the sake of simplicity for the reader.

Like in VLIC, the participants are evaluated based upon both an oral presentation and the content of the business plan, with emphasis on the latter. The teams need to deliver a business plan up to 20 pages with topics including financials, IPR, industry overview, market overview, customer identification, and business models among others.



## **5. Methodology**

In this section, the general research process of the thesis will be discussed. For more thorough reflections on the research design and methods used, this can be found in the methodology part of the two papers.

### **Literature sampling**

As the authors wanted to get a quick overview of relevant theory, the process of reviewing literature was started with the help of Lars Øystein Widding and Lars Kolvereid. Having a lot of experience and knowledge in the domains which we were looking for, they gave us valuable references to suitable authors and other suggestions as to where to start looking for information.

The tips gave us a good starting point, and the snowballing technique was applied to gather more literature. This implies that we used references of the articles read to expand the literature in a chain-referring manner. In addition, we used terms like “intention theory”, “business plan competition” and “entrepreneurship education” when searching through bibliographic databases, mostly accessed through Google Scholar. Many of these articles have been available thanks to our learning institution. Through the process, we came across articles that encompassed work from many disciplines, including entrepreneurship, education, sociology and psychology.

### **Data sampling**

In this cross-sectional study, two samples were used; one consisting of former participants of VC Mid-Norway, and another being a control group. Both are chosen from the judgment sampling method, which is a form of non-probability sampling (Marshall, 1996).

The former sample was based upon a list, provided by NEC, consisting of students which majors were either of institutes of the Gløshaugen campus at NTNU, or from the Faculty of Medicine, who were participants between 2003 and 2011. This would then constitute the study population, as opposed to VC Mid-Norway being the target population (Babbie, 2010). The reason for choosing students of these majors was twofold. First, they were preferred as we wanted to focus on a specific group of people, making the study more specialized. Second, and more importantly, technical graduates is an interesting group as they are more likely than others to start innovative businesses, contributing more to economic growth than others (Lüthje & Franke, 2003). As the survey was to be sent out through email, and the list did not include this information for all the individuals, other measures were carried out to obtain these, including calling them in person and searching online. This missing information, however, does not lead

to a lower representability, as this is a common issue in data sampling (Babbie, 2010). The survey was sent out to 240 individuals, with two reminders being sent out to those who did not reply to ensure a higher rate. In the end, 113 replied, yielding a response rate of 47.1%.

To better see the effects of the competition, a control group was made. This group should somewhat reflect the first one with respect to background characteristics. Hence, the same criteria were used as when choosing our first sample; students who participated between 2003 and 2011, with majors being of the Gløshaugen campus or of the Faculty of Medicine. The survey was sent out to 6 720 through the alumni office, and responses came back from 721, equaling a response rate of 10.7%. This group was not cross-checked with the other one, as this would have caused too much extra time, and since we further find it unlikely that anyone would respond to the same questionnaire twice.

Some individuals in the first sample turned out to not have participated in VC, and vice versa, resulting in a different number of individuals in each sample. In addition, a removal of non-engineer majors was performed, as a result of wanting to have a homogenous group and thus making the study more specialized. The end result was a group including students of 16 fields of engineering. Finally, responses in from each samples included 132 and 593, respectively. An overview of all responses can be found in Appendix A.

### **Questionnaire/Data Sources**

Surveys are suitable when explaining the occurrence of a phenomenon (Yin, 2009), making it fit for this thesis. Our questionnaire consisted of 24 questions that were either of a multiple choice single answer form, or were evaluative questions where a 5-point Likert scale was used. The questions were mostly formed on the basis of the questionnaire in Vegar Johansen's paper on the effects of entrepreneurship education (Johansen, 2011) and from former ones used by NEC, but several other articles were also sources of inspiration.

Ordering of the questions was done so that it started out with background questions, and, if the respondent had participated in VC, evaluative questions about this would follow. A part covering current employment, as well as current and past involvement in entrepreneurship came next. After that came more evaluative questions about knowledge about entrepreneurship. After that, there were evaluative questions covering entrepreneurial intentions and knowledge. Last, there were two optional questions that were not of importance to the data gathering.

The questionnaire was sent out using email and was open for answers for 32 days. Included in the email was an introduction to the survey and its object, how participants had been chosen, estimated time needed, their guaranteed anonymity and information about the



senders, in addition to a link to the questionnaire. Two raffle prizes were offered to achieve a high response rate.

## **Data Analysis**

The large number of quantitative data called for the use of some analytical tool. Without such help, the data analysis would simply have taken too much time. We ended up using the program SPSS 18.0, a widely used statistical analysis program.

Bivariate correlation testing has been the most used test in this study. The method tests the relationship between two variables, and based on this assigns a number from -1 to 1. It is widely used for explanatory purposes (Babbie, 2010), making it suitable to our context. We have also made use of independent t-tests, especially in cases involving where mean values have been compared to each other.

Each paper has described how it has analyzed its respective data. They have explained which questions have been used when testing the various hypotheses, and how they have been interpreted. Dummy variables have been used to facilitate the analysis process, and it has been controlled for third variables to prevent spurious relationships.

## **Limitations**

The samples were not taken entirely by random from the whole target population, as we used judgmental sampling. As a result, the samples are less representative than they would have been using a probability-based sampling method. On the other hand, the fact that both samples in this study are relatively large and that the groups are homogeneous, contribute to increasing the representability (Babbie, 2010). As a result, the samples are not representative for the population as a whole, but are likely to be generalizable to settings including technical graduates.

Using a cross-sectional approach does have its disadvantages in an explanatory study. As it is only focused on a single point in time, as opposed to a longitudinal study, it cannot claim causality through its findings. However, for the time needed to conduct a longitudinal study, this method would not have been possible for the authors of this thesis. Hence, we encourage other studies to conduct longitudinal studies with similar aims as this study.

The study has only looked at a single business plan competition. As there exists several different competitions, focusing on other ones may have yielded different results. Thus, to strengthen the generalizability of the results, other competitions should be used as cases.

In the questionnaire itself, there are some weaknesses. Some of the questions may be sources of retrospective bias, especially for those who participated in VC a long time ago, as

there were questions probing them for the outcomes of participation which could go back as far as 9 years. Other questions could with luck have been phrased differently to ensure answers more closely representing what the authors were after. Still, the authors believe that overall, the data collected is accurate and well fit for the aims of the study.

## **6. Summary of Appended Papers**

In this part, an overview will be given of the main aims and findings of the two papers.

### **Paper 1: The Implications of Self-Efficacy in Entrepreneurship**

#### **Aim of the Paper**

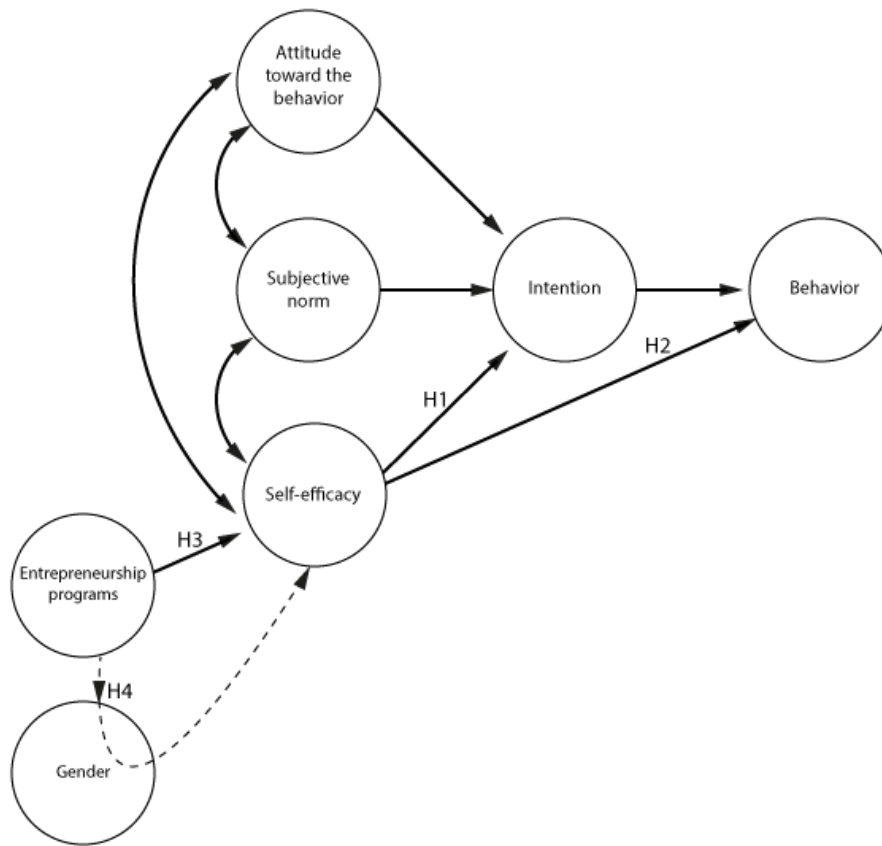
The paper aims to contribute to the inconsistency in the literature on the effects of self-efficacy. It also examines the effects of business plan competitions and how one may achieve more female entrepreneurs. More specifically, the paper tests the following hypotheses:

- Self-efficacy will be positively related to entrepreneurial intentions (H1)
- Self-efficacy will be positively related to having successfully launched a new business (H2)
- Participation in a business plan competition will be positively related to self-efficacy (H3)
- Women will have their self-efficacy enhanced more than men through participation in business plan competitions (H4)

#### **Summary of Findings**

The findings indicate that self-efficacy is positively related to both intentions and behavior, and that it correlates more with behavior than intentions do. Another finding is that business plan competitions positively affect the self-efficacy of participants, which together with the first findings strengthens the belief of that it may be utilized as a way to increase entrepreneurial endeavors. In addition, it is found that women's self-efficacy is more affected by participation in such competitions than that of men. This indicates that business plan competitions may be adapted to better fit the needs of women, thus being an important tool in the process of narrowing down the gender gap in entrepreneurship.

**Figure 1 - A Proposed Modified TPB Based on Paper 1**



## **Paper 2: How May Business Plan Competitions Better Increase Entrepreneurial Intention?**

### **Aim of the Paper**

The paper aims to identify the fields of knowledge within the entrepreneurial education curricula that have the highest effect on entrepreneurial intention and involvement. By doing this, the authors hope to contribute to a new perspective to the structure of business plan programs. Thus, the following hypotheses were tested in the paper:

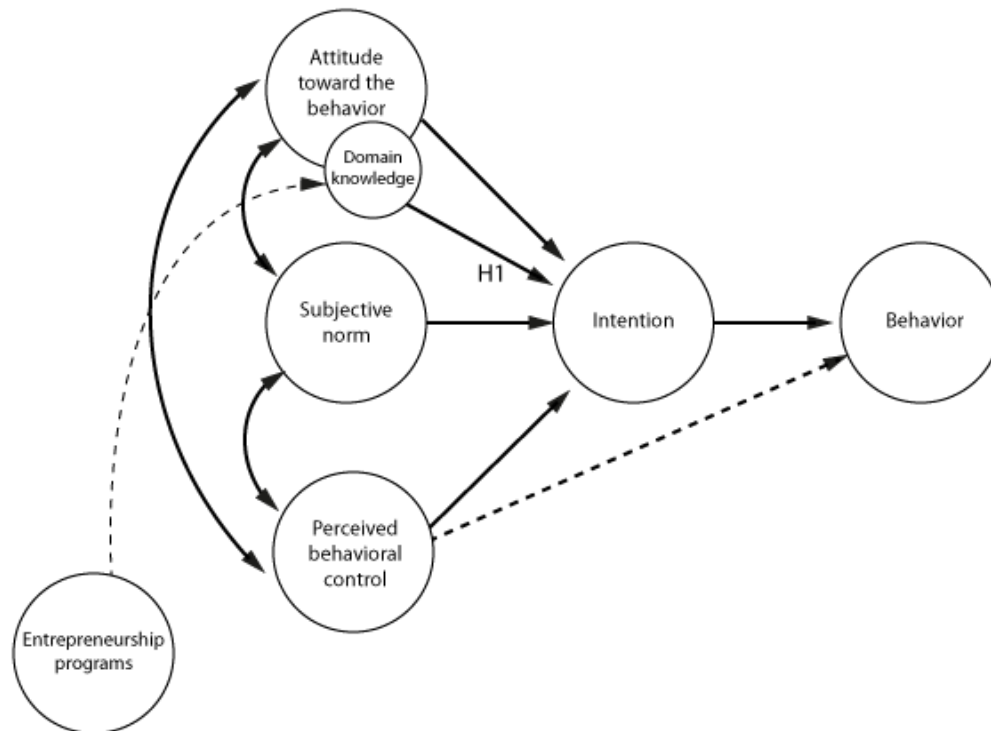
- There is a difference in the extent to which the various fields of knowledge, obtained during a business plan competition, affect entrepreneurial intentions.
- There is a difference in the extent to which the various fields of knowledge, obtained during a business plan competition, affect actual entrepreneurial involvement.

### **Summary of Findings**

The findings indicate that there is a difference in how the different learning modules affect entrepreneurial intention, while the second hypothesis was not supported. More specifically, the following three learning modules have a moderate correlation with an increase in

entrepreneurial intention: “Turning Idea into Plan”, “Customer Identification” and “Investment Presentation”. All of these modules differ from the other modules in their demand for a new perspective, challenging the student’s cognitive structure. These challenges ultimately change the cognitive map of the student, leading to new knowledge. In line with Ajzen’s request for a broadening of the TPB, the paper proposes the following revised structural model based upon its findings.

**Figure 2 - A Proposed Modified TPB Based on Paper 2**





## 7. Conclusions and Implications

The TPB is one of the most influential models in entrepreneurial research. Its psychological descriptions of human behavior have been found to be an appropriate tool in the understanding of entrepreneurial behavior. The elementary principles have been supported by a majority of papers, making it the dominant model in order to understand entrepreneurial intention and behavior.

Both papers have utilized the TPB in an entrepreneurial context. Given that setting, the two papers propose additional elements aimed at giving researchers a more fine-grained tool to predict of entrepreneurial intentions and behavior. The proposed modified TPB can be seen in figure 3.

### Implications for Further Research

The empirical data gathered and analyzed in this study has given further support for the TPB. It has done so by providing a contribution to the dispute in literature on the workings of the antecedent self-efficacy and its effect on intentions and behavior. Moreover, the results have given the authors reason to suggest modifications to Ajzen's model, who himself noted that he welcomed additional supplements to the theory as long as they improve the prediction of intentions or behavior.

One result slightly contradicts the TPB, however, as our results indicated self-efficacy as being a better predictor of behavior than intention as a predictor. The dashed line in the TPB was intended to visualize this lower accuracy in prediction for the self-efficacy construct, but this study suggests that this line be a solid one. More research should be conducted to support this finding.

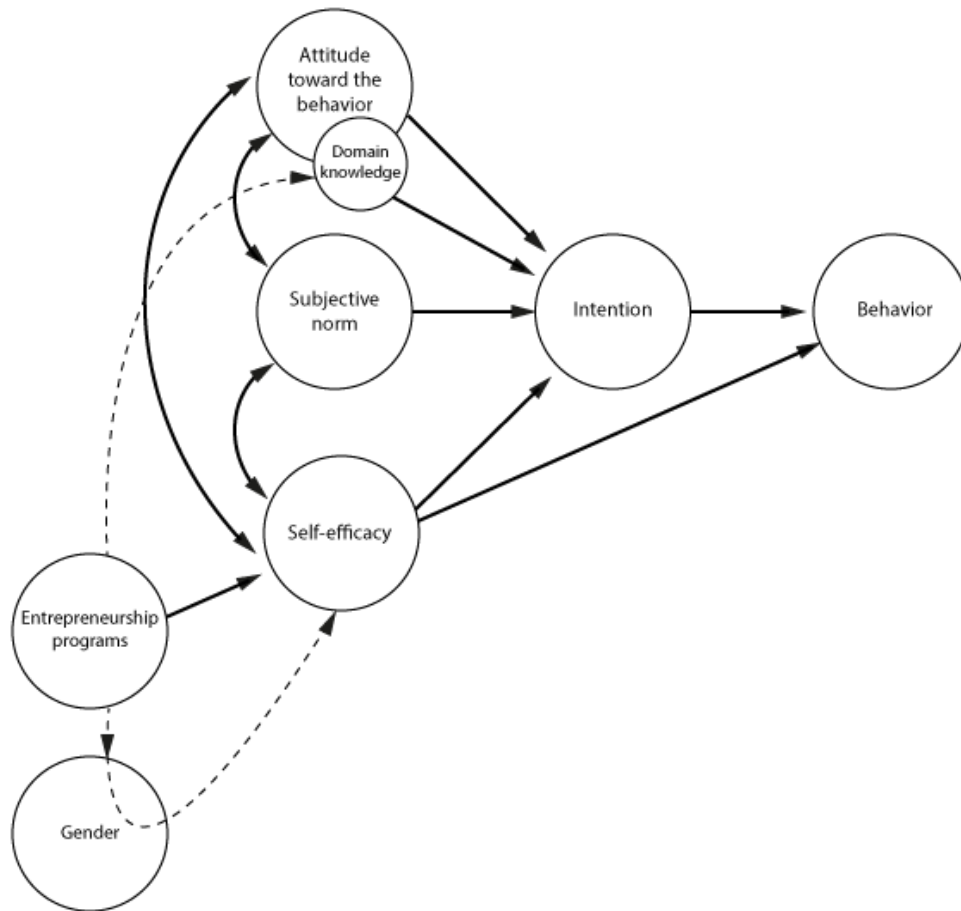
The first change is related to the various learning modules of business plan competitions and how these affect intentions. As Shapero and Sokol (1982) pointed out, skills and training affect the attitude towards behavior, thereby implicit affecting intention. Following their line of thought combined with our results that show the correlation between learning modules and intentions, and we get the proposed linkage as seen in figure 3.

An implication of this supplement is that it heightens the predictability of the TPB, making its predictions about a person's behavior more genuine. More specifically, it introduces a new measurement for educational researchers to compare a educational framework with the effect it has on its students post-course. We would urge for further studies on the matter, recommending a longitudinal study on the relationship between different learning modules and

the student's attitude pre-course. As prior attitude was not included in our study, its impact would need to be examined before our proposed supplement can be included in the TPB.

The second change came through the findings in paper one, and is connected to the self-efficacy construct. Knowledge around the antecedents of this complex construct has for a long time been vague, especially in terms of specific measures to enhance it. The findings in this study indicate that business plan competitions increase the self-efficacy of those participating, thus providing an efficient means of increasing entrepreneurial intentions and behavior.

**Figure 3 - The Final Proposed Modified TPB Based on the Two Papers**



### Implications for Practitioners

Self-efficacy has been shown to be an important contributor to both entrepreneurial intentions as well as behavior. This should be of interest for all parties involved with entrepreneurial education, particularly learning institutions and organizing faculty staff. Further, and especially since self-efficacy has previously been found to improve venture performance, governments have good reasons to dedicate more attention to the construct. Not only does this indicate that a bigger focus on self-efficacy will create more businesses, but that these firms will be better. As



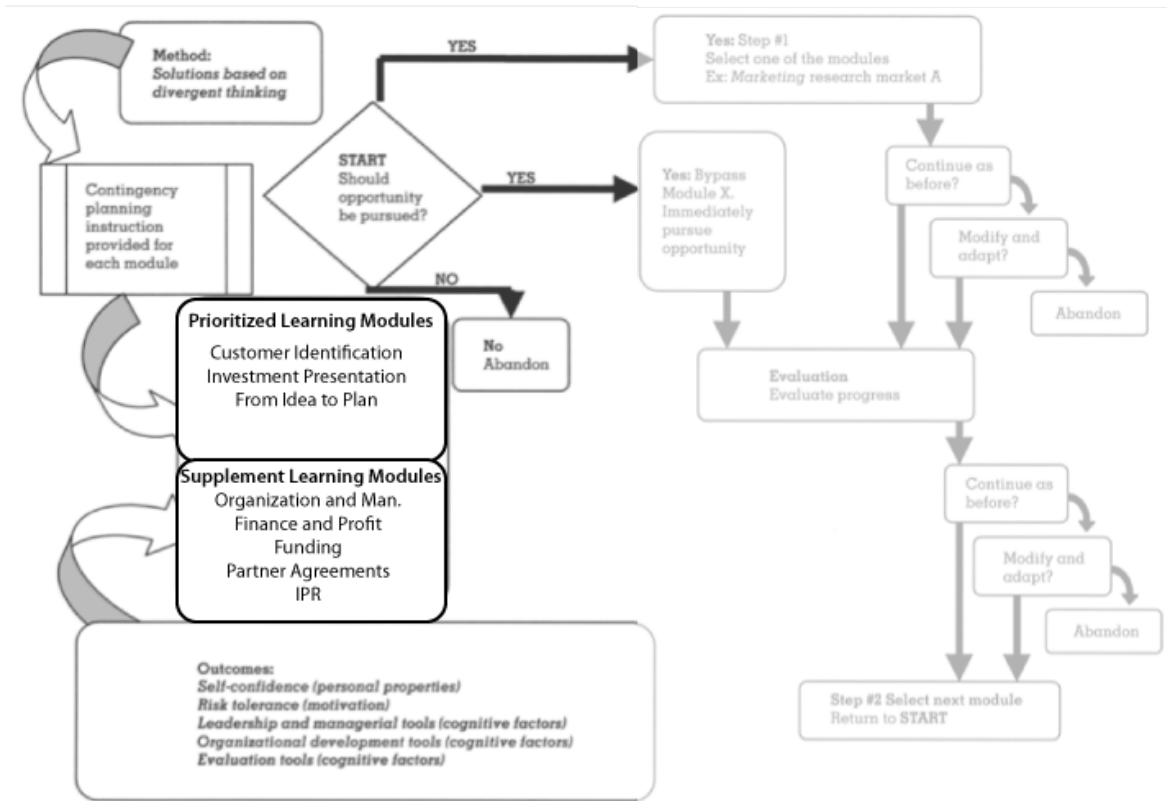
such, they will be great contributors to increased economic growth. Hence, we encourage governments to induce a greater focus on self-efficacy, for example by setting up incentives models for learning institutions to get more involved in business plan competitions.

Many researchers have dedicated considerable attention to the differences between the genders in terms of entrepreneurship, but few have focused on how they may be mitigated. Paper 1 contributes with findings that indicate that business plan competitions may be utilized to efficiently raise the self-efficacy of women. As self-efficacy leads to both intentions and behavior, and as it is the number one obstacle toward female entrepreneurship, the finding is of great interest for all those concerned with entrepreneurship and economic growth. We urge that more studies be conducted on the matter to further explore the potential of these competitions to promote female entrepreneurial endeavors.

The findings related to the outcomes of business plan competitions, may be of benefit for the organizers of such events. As they get a better insight, they can use this to improve the competitions, or to attract more sponsors. In addition, it seems like these events may be an efficient way of increasing female entrepreneurial self-efficacy, thus improving women entrepreneurship. This can be exploited in two ways. First, such competitions may deploy initiatives to boost the participation rate of women, to ensure that more women are exposed to this form of entrepreneurial training. Second, they can be adapted to even further enhance women's self-efficacy, which for instance may be done through the introduction of more female mentors and role models.

Last, paper 2 identified several learning modules, which has a higher effect on entrepreneurial intentions than others, as seen in figure 4. By including a differentiated set of learning modules into the contingency model (Honig, 2004), it will make this dialectic approach more viable for faculty staff, as some learning institutions may lack the resources to offer every learning module. In addition, learning modules should receive different attention based on the circumstance, as shown in paper 2, and not all modules need necessarily be taught in all cases.

Figure 4 - Enhanced Contingency Model



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## Appendix A (Overview of answers)

<b>Survey 1:</b>	Entreprenørskap og nyskapning		
<b>Respondents:</b>	721	<b>Status:</b>	Closed
<b>Launched Date:</b>	N/A	<b>Closed Date:</b>	12.03.2012
<b>Survey 2:</b>	Erfaringsbakgrunn og involvering i nyskapningsaktiviteter		
<b>Respondents:</b>	113	<b>Status:</b>	Closed
<b>Launched Date:</b>	09.02.2012	<b>Closed Date:</b>	12.03.2012

Survey ID : 900, Question ID : 1. Kjønn

		<b>Response Total</b>	<b>Response Percent</b>
Kvinne		198	28%
Mann		511	72%
		<b>Total Respondents</b>	<b>709</b>

Survey ID : 851, Question ID : 1. Kjønn

		<b>Response Total</b>	<b>Response Percent</b>
Kvinne		18	16%
Mann		95	84%
		<b>Total Respondents</b>	<b>113</b>

Survey ID : 900, Question ID : 2. Alder

	<b>Response Average</b>
View responses to this question <a href="#">view</a>	30,5
<b>Total Respondents</b>	<b>709</b>

Survey ID : 851, Question ID : 2. Alder

	<b>Response Average</b>
View responses to this question <a href="#">view</a>	30,16
<b>Total Respondents</b>	<b>113</b>

Survey ID : 900, Question ID : 3. Hvor er du og dine foreldre født?

		Response Total	Response Percent
Jeg er født i Norge, og begge mine foreldre er født i Norge		651	92%
Jeg er født i Norge, men en eller begge av mine foreldre er født i utlandet		32	5%
Jeg er født i utlandet		26	4%
<b>Total Respondents</b>		<b>709</b>	

Survey ID : 851, Question ID : 3. Hvor er du og dine foreldre født?

		Response Total	Response Percent
Jeg er født i Norge, og begge mine foreldre er født i Norge		98	87%
Jeg er født i Norge, men en eller begge av mine foreldre er født i utlandet		10	9%
Jeg er født i utlandet		5	4%
<b>Total Respondents</b>		<b>113</b>	

Survey ID : 900, Question ID : 4. Har noen av dine foreldre noen gang vært selvstendig næringsdrivende?

		Response Total	Response Percent
Ja		288	41%
Nei		421	59%
<b>Total Respondents</b>		<b>709</b>	

Survey ID : 851, Question ID : 4. Har noen av dine foreldre noen gang vært selvstendig næringsdrivende?

		Response Total	Response Percent
Ja		55	49%
Nei		58	51%
<b>Total Respondents</b>		<b>113</b>	



Survey ID : 900, Question ID : 5. Har du vært involvert i følgende i løpet av ungdoms- eller videregående skole?

	Ja	Nei	Response Total
Ungt Entreprenørskap (elev- eller ungdomsbedrift)	4,23% (30)	95,77% (679)	709
Entreprenørskapsfag, økonomi eller administrasjon	22,85% (162)	77,15% (547)	709
Prosjektarbeid i team på omfattende prosjekt	40,06% (284)	59,94% (425)	709
Sommerjobb/deltidsjobb i privat næringsliv	83,07% (589)	16,93% (120)	709
Sommerjobb/deltidsjobb i offentlig virksomhet	41,04% (291)	58,96% (418)	709
	Total Respondents		709




Survey ID : 851, Question ID : 5. Har du vært involvert i følgende i løpet av ungdoms- eller videregående skole?

	Ja	Nei	Response Total
Ungt Entreprenørskap (elev- eller ungdomsbedrift)	10,62% (12)	89,38% (101)	113
Entreprenørskapsfag, økonomi eller administrasjon	28,32% (32)	71,68% (81)	113
Prosjektarbeid i team på omfattende prosjekt	36,28% (41)	63,72% (72)	113
Sommerjobb/deltidsjobb i privat næringsliv	89,38% (101)	10,62% (12)	113
Sommerjobb/deltidsjobb i offentlig virksomhet	31,86% (36)	68,14% (77)	113
	Total Respondents		113

Survey ID : 900, Question ID : 6. Hva slags høyere utdanning har du eller er du i ferd med å ta?

		Response Total	Response Percent
Ingen		16	2%
Bachelor		0	0%
Master		615	88%
PhD		68	10%
	Total Respondents		699

Survey ID : 851, Question ID : 6. Hva slags høyere utdanning har du eller er du i ferd med å ta?

		Response Total	Response Percent
Ingen		4	4%
Bachelor		12	11%
Master		87	79%
PhD		7	6%
	Total Respondents		110

Survey ID : 900, Question ID : 7. Studium ved NTNU (sett ett kryss)

		Response Total	Response Percent
Bygg		60	9%
Datateknikk		83	12%
Kommunikasjonsteknologi		39	6%
Elektronikk		36	5%
Energi og miljø		37	5%
Fysikk og matematikk		60	9%
Industriell Design		16	2%
Industriell økonomi og teknologiledelse		87	12%
Industriell Kjemi/Biologi		44	6%
Marinteknikk		33	5%
Materialteknologi		15	2%
Ingeniørvitenskap og IKT		13	2%
Nanoteknologi		0	0%
Petroleum/Geofag		19	3%
Produktutvikling og produksjon		51	7%
Teknisk Kybernetikk		43	6%
Arkitektur		10	1%
Annet, vennligst spesifiser <input type="button" value="view"/>		54	8%
<b>Total Respondents</b>		<b>699</b>	

Survey ID : 851, Question ID : 7. Studium ved NTNU (sett ett kryss)

		Response Total	Response Percent
Bygg		4	4%
Datateknikk		12	11%
Kommunikasjonsteknologi		7	6%
Elektronikk		3	3%
Energi og miljø		5	5%
Fysikk og matematikk		1	1%
Industriell Design		11	10%
Industriell økonomi og teknologiledelse		21	19%
Industriell Kjemi/Biologi		5	5%
Marinteknikk		3	3%
Materialteknologi		0	0%
Ingeniørvitenskap og IKT		3	3%
Nanoteknologi		4	4%
Petroleum/Geofag		0	0%
Produktutvikling og produksjon		8	7%
Teknisk Kybernetikk		3	3%
Arkitektur		0	0%
Annet, vennligst spesifiser <input type="button" value="view"/>		20	18%
<b>Total Respondents</b>		<b>110</b>	

Survey ID : 900, Question ID : 8. Hvilket alternativ passer best for din yrkesaktivitet akkurat nå?

		Response Total	Response Percent
Arbeidstaker		652	93%
Selvstendig næringsdrivende		28	4%
Arbeidsledig		5	1%
Student		11	2%
Annet		2	0%
<b>Total Respondents</b>		<b>698</b>	

Survey ID : 851, Question ID : 8. Hvilket alternativ passer best for din yrkesaktivitet akkurat nå?

		Response Total	Response Percent
Arbeidstaker		71	65%
Selvstendig næringsdrivende		16	15%
Arbeidsledig		1	1%
Student		21	19%
Annet		1	1%
<b>Total Respondents</b>		<b>110</b>	

Survey ID : 900, Question ID : 9. Hvilke av følgende nyskappingsaktiviteter har du deltatt på?

	Har deltatt	Har ikke deltatt	Response Total
Venture Cup	6,88% (48)	93,12% (650)	698
Take-Off	8,02% (56)	91,98% (642)	698
Gründerskolen	5,59% (39)	94,41% (659)	698
Entreprenørskolen	2,44% (17)	97,56% (681)	698
<b>Total Respondents</b>			<b>698</b>

Survey ID : 851, Question ID : 9. Hvilke av følgende nyskappingsaktiviteter har du deltatt på?

	Har deltatt	Har ikke deltatt	Response Total
Venture Cup	97,27% (107)	2,73% (3)	110
Take-Off	29,09% (32)	70,91% (78)	110
Gründerskolen	20,91% (23)	79,09% (87)	110
Entreprenørskolen	10,91% (12)	89,09% (98)	110
<b>Total Respondents</b>			<b>110</b>

Survey ID : 900, Question ID : 10. I hvilken grad er du enig i at følgende er dekkende med hvorfor du ønsket å delta i Venture Cup?

	<b>Svært uenig</b>	<b>Delvis uenig</b>	<b>Verken enig eller uenig</b>	<b>Delvis enig</b>	<b>Svært enig</b>	<b>Response Total</b>
Jeg hadde en forretningsidé jeg ønsket å utvikle	12,2% (5)	17,07% (7)	12,2% (5)	26,83% (11)	31,71% (13)	<b>41</b>
Jeg ønsket å lære om oppstart av bedrift	4,88% (2)	2,44% (1)	7,32% (3)	46,34% (19)	39,02% (16)	<b>41</b>
Jeg ønsket å lære om forretningsutvikling	7,32% (3)	0% (0)	0% (0)	56,1% (23)	36,59% (15)	<b>41</b>
Vi var et venneteam som ønsket å utvikle en idé	24,39% (10)	17,07% (7)	19,51% (8)	17,07% (7)	21,95% (9)	<b>41</b>
Jeg tok Venture Cup som et forkurs til Gründerskolen	65,85% (27)	0% (0)	19,51% (8)	9,76% (4)	4,88% (2)	<b>41</b>
Jeg tok Venture Cup for å styrke mine opptaksmuligheter til Entreprenørskolen	68,29% (28)	4,88% (2)	21,95% (9)	4,88% (2)	0% (0)	<b>41</b>
<b>Total Respondents</b>						<b>41</b>

Survey ID : 851, Question ID : 10. I hvilken grad er du enig i at følgende er dekkende med hvorfor du ønsket å delta i Venture Cup?

	<b>Svært uenig</b>	<b>Delvis uenig</b>	<b>Verken enig eller uenig</b>	<b>Delvis enig</b>	<b>Svært enig</b>	<b>Response Total</b>
Jeg hadde en forretningsidé jeg ønsket å utvikle	13,59% (14)	10,68% (11)	15,53% (16)	19,42% (20)	40,78% (42)	<b>103</b>
Jeg ønsket å lære om oppstart av bedrift	4,85% (5)	2,91% (3)	16,5% (17)	30,1% (31)	45,63% (47)	<b>103</b>
Jeg ønsket å lære om forretningsutvikling	2,91% (3)	0% (0)	11,65% (12)	33,98% (35)	51,46% (53)	<b>103</b>
Vi var et venneteam som ønsket å utvikle en idé	24,27% (25)	10,68% (11)	9,71% (10)	24,27% (25)	31,07% (32)	<b>103</b>
Jeg tok Venture Cup som et forkurs til Gründerskolen	76,7% (79)	2,91% (3)	7,77% (8)	3,88% (4)	8,74% (9)	<b>103</b>
Jeg tok Venture Cup for å styrke mine opptaksmuligheter til Entreprenørskolen	81,55% (84)	5,83% (6)	6,8% (7)	2,91% (3)	2,91% (3)	<b>103</b>
<b>Total Respondents</b>						<b>103</b>

Survey ID : 900, Question ID : 11. I hvilken grad lærte du om følgende ved å delta på Venture Cup?

	I meget liten grad	I liten grad	I noen grad	I stor grad	I meget stor grad	Response Total
Utvikle et forretningskonsept til en forretningsplan	2,44% (1)	2,44% (1)	34,15% (14)	41,46% (17)	19,51% (8)	41
Gjennomføre undersøkelse av kundebehov, kundeverdi, markedsundersøkelse	4,88% (2)	17,07% (7)	36,59% (15)	31,71% (13)	9,76% (4)	41
Utforme forretningsmodell	2,44% (1)	2,44% (1)	41,46% (17)	46,34% (19)	7,32% (3)	41
Beregning av finansieringsbehov og mulig lønnsomhet	4,88% (2)	17,07% (7)	48,78% (20)	24,39% (10)	4,88% (2)	41
Organisering og sammensetning av ledelse i nystartet foretak	9,76% (4)	19,51% (8)	29,27% (12)	39,02% (16)	2,44% (1)	41
Innsikt i hvordan inngå samarbeidsavtale både med leverandører og partnere	19,51% (8)	31,71% (13)	34,15% (14)	12,2% (5)	2,44% (1)	41
Hvordan presentere et oppstartsprosjekt for finansierer	9,76% (4)	14,63% (6)	31,71% (13)	26,83% (11)	17,07% (7)	41
Hvem som representerer de viktigste finansieringskildene under oppstart og tidlig utvikling av en bedrift	7,32% (3)	17,07% (7)	48,78% (20)	19,51% (8)	7,32% (3)	41
Total Respondents						41

Survey ID : 851, Question ID : 11. I hvilken grad lærte du om følgende ved å delta på Venture Cup?

	I meget liten grad	I liten grad	I noen grad	I stor grad	I meget stor grad	Response Total
Utvikle et forretningskonsept til en forretningsplan	1,94% (2)	2,91% (3)	21,36% (22)	49,51% (51)	24,27% (25)	103
Gjennomføre undersøkelse av kundebehov, kundeverdi, markedsundersøkelse	6,8% (7)	19,42% (20)	37,86% (39)	24,27% (25)	11,65% (12)	103
Utforme forretningsmodell	1,94% (2)	5,83% (6)	39,81% (41)	38,83% (40)	13,59% (14)	103
Beregning av finansieringsbehov og mulig lønnsomhet	6,8% (7)	22,33% (23)	37,86% (39)	23,3% (24)	9,71% (10)	103
Organisering og sammensetning av ledelse i nystartet foretak	10,68% (11)	33,98% (35)	37,86% (39)	12,62% (13)	4,85% (5)	103
Innsikt i hvordan inngå samarbeidsavtale både med leverandører og partnere	22,33% (23)	38,83% (40)	27,18% (28)	8,74% (9)	2,91% (3)	103
Hvordan presentere et oppstartsprosjekt for finansierer	12,62% (13)	19,42% (20)	35,92% (37)	21,36% (22)	10,68% (11)	103
Hvem som representerer de viktigste finansieringskildene under oppstart og tidlig utvikling av en bedrift	10,68% (11)	12,62% (13)	35,92% (37)	33,98% (35)	6,8% (7)	103
Total Respondents						103

Survey ID : 900, Question ID : 12. I hvilken grad følte du rett etter deltakelsen i Venture Cup at det å utvikle en forretningsidé til en bedrift var en overkommelig oppgave for deg?

	Response Total	Response Percent
I meget liten grad overkommelig	3	7%
I liten grad overkommelig	2	5%
I noen grad overkommelig	15	37%
I stor grad overkommelig	17	41%
I meget stor grad overkommelig	4	10%
Total Respondents		41

Survey ID : 851, Question ID : 12. I hvilken grad følte du rett etter deltakelsen i Venture Cup at det å utvikle en forretningsidé til en bedrift var en overkommelig oppgave for deg?

	Response Total	Response Percent
I meget liten grad overkommelig	2	2%
I liten grad overkommelig	4	4%
I noen grad overkommelig	37	36%
I stor grad overkommelig	48	47%
I meget stor grad overkommelig	12	12%
Total Respondents		103

Survey ID : 900, Question ID : 13. I hvilken grad er du enig i at følgende var noe av effekten av å delta på Venture Cup?

	<b>Svært uenig</b>	<b>Delvis uenig</b>	<b>Verken enig eller uenig</b>	<b>Delvis enig</b>	<b>Svært enig</b>	<b>Response Total</b>
Jeg fikk lyst til å lære mer om hvordan starte en bedrift	4,88% (2)	0% (0)	24,39% (10)	43,9% (18)	26,83% (11)	<b>41</b>
Jeg fikk lyst til å delta på Take-Off	9,76% (4)	17,07% (7)	39,02% (16)	26,83% (11)	7,32% (3)	<b>41</b>
Jeg fikk lyst til å begynne på Entreprenørskolen	12,2% (5)	24,39% (10)	51,22% (21)	9,76% (4)	2,44% (1)	<b>41</b>
Jeg fikk lyst til å delta på Venture Cup igjen	7,32% (3)	19,51% (8)	36,59% (15)	29,27% (12)	7,32% (3)	<b>41</b>
Jeg fikk lyst til å delta på Gründerskolen	12,2% (5)	24,39% (10)	41,46% (17)	21,95% (9)	0% (0)	<b>41</b>
Jeg fikk lyst til å starte en bedrift	2,44% (1)	7,32% (3)	26,83% (11)	43,9% (18)	19,51% (8)	<b>41</b>
<b>Total Respondents</b>						<b>41</b>

Survey ID : 851, Question ID : 13. I hvilken grad er du enig i at følgende var noe av effekten av å delta på Venture Cup?

	<b>Svært uenig</b>	<b>Delvis uenig</b>	<b>Verken enig eller uenig</b>	<b>Delvis enig</b>	<b>Svært enig</b>	<b>Response Total</b>
Jeg fikk lyst til å lære mer om hvordan starte en bedrift	1,94% (2)	4,85% (5)	15,53% (16)	39,81% (41)	37,86% (39)	<b>103</b>
Jeg fikk lyst til å delta på Take-Off	9,71% (10)	8,74% (9)	49,51% (51)	13,59% (14)	18,45% (19)	<b>103</b>
Jeg fikk lyst til å begynne på Entreprenørskolen	17,48% (18)	17,48% (18)	33,98% (35)	16,5% (17)	14,56% (15)	<b>103</b>
Jeg fikk lyst til å delta på Venture Cup igjen	4,85% (5)	15,53% (16)	25,24% (26)	37,86% (39)	16,5% (17)	<b>103</b>
Jeg fikk lyst til å delta på Gründerskolen	16,5% (17)	17,48% (18)	38,83% (40)	16,5% (17)	10,68% (11)	<b>103</b>
Jeg fikk lyst til å starte en bedrift	2,91% (3)	2,91% (3)	22,33% (23)	43,69% (45)	28,16% (29)	<b>103</b>
<b>Total Respondents</b>						<b>103</b>

Survey ID : 900, Question ID : 14. Jobber du i dag innen privat eller offentlig sektor?

		<b>Response Total</b>	<b>Response Percent</b>
Privat		<b>536</b>	<b>80%</b>
Offentlig		<b>132</b>	<b>20%</b>
<b>Total Respondents</b>		<b>668</b>	

Survey ID : 851, Question ID : 14. Jobber du i dag innen privat eller offentlig sektor?

		<b>Response Total</b>	<b>Response Percent</b>
Privat		<b>74</b>	<b>91%</b>
Offentlig		<b>7</b>	<b>9%</b>
<b>Total Respondents</b>		<b>81</b>	

Survey ID : 900, Question ID : 15. I hvilken grad er du involvert i nyskapning på arbeidsplassen, som for eksempel rådgiver eller aktør i forbindelse med finansiering, produktutvikling eller markedsutvikling?

	<b>I meget liten grad</b>	<b>I liten grad</b>	<b>I noen grad</b>	<b>I stor grad</b>	<b>I meget stor grad</b>	<b>Response Total</b>
I min stilling	15,42% (103)	19,46% (130)	29,49% (197)	19,91% (133)	15,72% (105)	<b>668</b>
I min organisasjon som helhet	16,47% (110)	19,91% (133)	27,25% (182)	21,11% (141)	15,27% (102)	<b>668</b>
<b>Total Respondents</b>						<b>668</b>

Survey ID : 851, Question ID : 15. I hvilken grad er du involvert i nyskapning på arbeidsplassen, som for eksempel rådgiver eller aktør i forbindelse med finansiering, produktutvikling eller markedsutvikling?

	<b>I meget liten grad</b>	<b>I liten grad</b>	<b>I noen grad</b>	<b>I stor grad</b>	<b>I meget stor grad</b>	<b>Response Total</b>
I min stilling	4,94% (4)	14,81% (12)	13,58% (11)	25,93% (21)	40,74% (33)	<b>81</b>
I min organisasjon som helhet	4,94% (4)	14,81% (12)	14,81% (12)	30,86% (25)	34,57% (28)	<b>81</b>
<b>Total Respondents</b>						<b>81</b>

Survey ID : 900, Question ID : 16. Hvor er din arbeidsplass lokalisert?

View responses to this question [view](#)

**Response Average** 3385,43

**Total Respondents** 668

Survey ID : 851, Question ID : 16. Hvor er din arbeidsplass lokalisert?

View responses to this question [view](#)

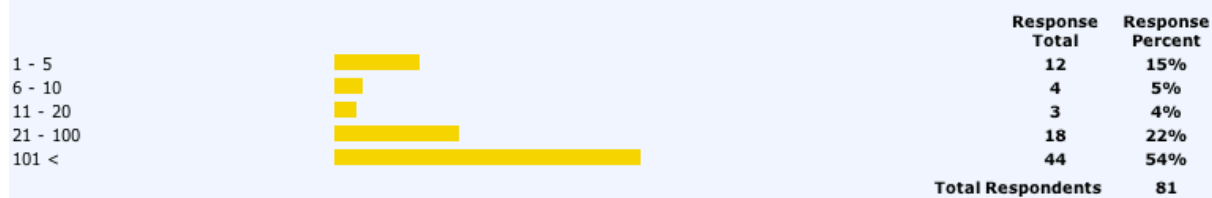
**Response Average** 3772,15

**Total Respondents** 81

Survey ID : 900, Question ID : 17. Hvor mange ansatte er det i din organisasjon totalt?






Survey ID : 851, Question ID : 17. Hvor mange ansatte er det i din organisasjon totalt?



Survey ID : 900, Question ID : 18. Har du alene eller sammen med andre forsøkt å starte en bedrift?

		Response Total	Response Percent
Nei, og jeg har ikke intensjoner om å etablere bedrift		460	68%
Nei, men jeg har intensjoner om å etablere bedrift i nær fremtid		84	12%
Ja, jeg er involvert i et etableringsforsøk (ikke registrert i Brønnøysundregisteret)		16	2%
Ja, jeg eier bedrift som er etablert de siste 3 1/2 år (etablert etter august 2008)		46	7%
Ja, jeg eier bedrift som er eldre enn 3 1/2 år (etablert før august 2008)		39	6%
Ja, men bedriften er lagt ned/kvittet seg med		32	5%
<b>Total Respondents</b>		<b>677</b>	

Survey ID : 851, Question ID : 18. Har du alene eller sammen med andre forsøkt å starte en bedrift?

		Response Total	Response Percent
Nei, og jeg har ikke intensjoner om å etablere bedrift		31	30%
Nei, men jeg har intensjoner om å etablere bedrift i nær fremtid		11	10%
Ja, jeg er involvert i et etableringsforsøk (ikke registrert i Brønnøysundregisteret)		11	10%
Ja, jeg eier bedrift som er etablert de siste 3 1/2 år (etablert etter august 2008)		25	24%
Ja, jeg eier bedrift som er eldre enn 3 1/2 år (etablert før august 2008)		12	11%
Ja, men bedriften er lagt ned/kvittet seg med		15	14%
<b>Total Respondents</b>		<b>105</b>	



Survey ID : 900, Question ID : 19. I hvilken grad har du i dag innsikt om følgende sider ved å starte bedrift?

	I meget liten grad	I liten grad	I noen grad	I stor grad	I meget stor grad	Response Total
Utvikle et forretningskonsept til en forretningsplan	26,14% (177)	23,34% (158)	30,87% (209)	14,92% (101)	4,73% (32)	677
Gjennomføre undersøkelse av kundebehov, kundeverdi, markedsundersøkelse	28,06% (190)	28,8% (195)	27,18% (184)	12,41% (84)	3,55% (24)	677
Utforme forretningsmodell	28,8% (195)	29,99% (203)	24,37% (165)	13,29% (90)	3,55% (24)	677
Beregning av finansieringsbehov og mulig lønnsomhet	27,47% (186)	29,39% (199)	26,74% (181)	13,74% (93)	2,66% (18)	677
Organisering og sammensetning av ledelse i nystartet foretak	32,2% (218)	32,35% (219)	21,27% (144)	10,78% (73)	3,4% (23)	677
Innsikt i hvordan inngå samarbeidsavtale både med medleverandører og partnere	35,01% (237)	30,58% (207)	23,19% (157)	8,42% (57)	2,81% (19)	677
Hvordan presentere et oppstartsprosjekt for finansierer	33,23% (225)	31,91% (216)	20,24% (137)	12,11% (82)	2,51% (17)	677
Hvem som representerer de viktigste finansieringskildene under oppstart og tidlig utvikling av en bedrift	31,61% (214)	33,09% (224)	23,63% (160)	7,24% (49)	4,43% (30)	677
Total Respondents						677

Survey ID : 851, Question ID : 19. I hvilken grad har du i dag innsikt om følgende sider ved å starte bedrift?

	I meget liten grad	I liten grad	I noen grad	I stor grad	I meget stor grad	Response Total
Utvikle et forretningskonsept til en forretningsplan	0% (0)	4,81% (5)	30,77% (32)	36,54% (38)	27,88% (29)	104
Gjennomføre undersøkelse av kundebehov, kundeverdi, markedsundersøkelse	0,96% (1)	11,54% (12)	41,35% (43)	30,77% (32)	15,38% (16)	104
Utforme forretningsmodell	0,96% (1)	10,58% (11)	33,65% (35)	32,69% (34)	22,12% (23)	104
Beregning av finansieringsbehov og mulig lønnsomhet	0,96% (1)	21,15% (22)	32,69% (34)	27,88% (29)	17,31% (18)	104
Organisering og sammensetning av ledelse i nystartet foretak	0,96% (1)	18,27% (19)	35,58% (37)	30,77% (32)	14,42% (15)	104
Innsikt i hvordan inngå samarbeidsavtale både med medleverandører og partnere	0,96% (1)	28,85% (30)	36,54% (38)	24,04% (25)	9,62% (10)	104
Hvordan presentere et oppstartsprosjekt for finansierer	0,96% (1)	10,58% (11)	39,42% (41)	26,92% (28)	22,12% (23)	104
Hvem som representerer de viktigste finansieringskildene under oppstart og tidlig utvikling av en bedrift	0% (0)	12,5% (13)	34,62% (36)	31,73% (33)	21,15% (22)	104
Total Respondents						104

Survey ID : 900, Question ID : 20. I hvilken grad har du i dag en innsikt som gjør at det å utvikle en forretningsidé til en bedrift er en overkommelig oppgave for deg?

		Response Total	Response Percent
I meget liten grad overkommelig		120	18%
I liten grad overkommelig		200	30%
I noen grad overkommelig		240	35%
I stor grad overkommelig		92	14%
I meget stor grad overkommelig		25	4%
Total Respondents		677	

Survey ID : 851, Question ID : 20. I hvilken grad har du i dag en innsikt som gjør at det å utvikle en forretningsidé til en bedrift er en overkommelig oppgave for deg?

		Response Total	Response Percent
I meget liten grad overkommelig		0	0%
I liten grad overkommelig		6	6%
I noen grad overkommelig		38	37%
I stor grad overkommelig		35	34%
I meget stor grad overkommelig		25	24%
Total Respondents		104	



## **Appendix B (Email sent with link to questionnaire)**

### ***Erfaringsbakgrunn og involvering i nyskappingsaktiviteter***

*NTNU Entrepreneurship Center (NEC) har gjennomført Venture Cup (VC) ved NTNU siden 2003, og føler nå behov for å få en tilbakemelding på effekten av VC.*

#### ***Bakgrunn***

*VC ved NTNU har behov for eksterne midler til finansiering av premier og gjennomføring, og NEC er derfor avhengige av å tydeliggjøre læringseffekten av konkurransen ovenfor eksterne aktører. Videre ønsker START Norge at NEC skal bidra til å løfte VC opp til samme kvalitet som ved NTNU i resten av landet der konkurransen arrangeres.*

*Spørreskjemaet tar ca 6 minutter å fylle ut, og svarene vil være til stor hjelp i forhold til å opprettholde tilbudet for studentene ved NTNU. I tillegg vil innsamlet data bli brukt i en masteroppgave skrevet av Atle Myhrer (Entreprenørskolen) og Jonas Berger (Industriell økonomi) om entreprenørskap i høyere utdanning.*

### ***Konfidensialitet***

*Data som samles inn kan ikke spores tilbake til enkeltpersoner i offentlig tilgjengelige publikasjoner. Videre står undertegnede ansvarlig for at informasjonen ikke videredistribueres til uvedkommende.*

### ***Premie***

*På siste side av spørreskjemaet vil man ha mulighet til å registrere sin epostadresse for å være med i trekningen av to stk. Kindle lesebrett. Det er også mulig å få tilsendt et sammendrag av undersøkelsen for de som ønsker det.*

*Trykk her for å finne spørreskjemaet. Frist for besvarelse er tirsdag 14. februar.*

*Om du har noen spørsmål eller problemer med spørreskjemaet kan du kontakte:*

*Atle Myhrer, [atlemyh@stud.ntnu.no](mailto:atlemyh@stud.ntnu.no), 90 76 42 35*

*Jonas Berger, [jonasbe@stud.ntnu.no](mailto:jonasbe@stud.ntnu.no), 48 00 34 63*

*På forhånd takk!*

*Vennlig hilsen,*

*Sigmund Waagø, Ph.D., Professor/Leder NEC - Atle Myhrer, student Entreprenørskolen - Jonas Berger, student Industriell økonomi*



# **Paper 1**

## **The Implications of Self-Efficacy in Entrepreneurship**

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Atle Myhrer

Norwegian University of Science and Technology

Department of Industrial Economics and Technology Management



## Abstract

**Purpose** - Drawing on Ajzen's theory of planned behavior, this study focuses on the complex construct of self-efficacy and its impact on intentions and behavior. The purpose is a better insight into self-efficacy and how it may be affected through entrepreneurship education, and how to help narrowing down the gender gap in entrepreneurship.

**Design/methodology/approach** - 132 former participants of a business plan competition and a control group of 593 former students participated in this cross-sectional, explanatory study through responding to a structured questionnaire. Bivariate correlation and independent t-testing were used to analyze the data.

**Findings** - Self-efficacy is positively related with both intentions and behavior. Participation in a business plan competition increases self-efficacy, and this increase is stronger in female participants than in male participants.

**Research limitations/implications** - The findings support the theory of planned behavior as well as the behavioral plasticity theory. Future longitudinal studies should be conducted to further address when and why differences in self-efficacy between the genders emerge.

**Practical implications** - Governments should give more attention to business plan competitions and initiate incentives for the introduction of more and better activities of this type. These events should be closer adapted to the needs of women to help diminish the gender gap in entrepreneurship.

**Originality/value** - Few studies on entrepreneurial intention and behavior have included control groups. This, as well as the focus on science and technology students, makes this study unique. In addition, the effects of business plan competitions on self-efficacy have to date not been properly empirically tested.

**Keywords** - The theory of planned behavior, self-efficacy, business plan competitions, entrepreneurship education, entrepreneurship gender gap

**Paper type** - Research paper





# 1. Introduction

Entrepreneurship has several positive implications for the society; it increases economic efficiencies, spurs innovation, and maintains employment levels while creating new jobs (Shane & Venkataraman, 2000). More students are becoming interested in becoming self-employed, while they have become less interested in organizational employment (Kolvereid, 1996a; Lüthje & Franke, 2003). These two facts suggest that education within the entrepreneurial domain is important, and education within this field has in fact received increased attention throughout the world (Fayolle & Gailly, 2004). In the U.S., subjects of entrepreneurship are offered at nearly every business college (Karlsson, 2005).

Innovation is the entrepreneur's number one activity (Drucker, 1985), and is a key to becoming competitive (Hitt, Ireland, Camp, & Sexton, 2001). Governments who are seeking an innovative and economically healthy society should thus have entrepreneurial education as an area of focus (Russell, Atchison, & Brooks, 2008). Although the field of entrepreneurship education has witnessed an enormous growth during the last decades, the studies on its effects has been inconclusive at best (Wilson, Kickul, & Marlino, 2007). This implies that a better understanding is needed in order to improve this education and thus increase the quality and quantity of entrepreneurs.

Individuals with an "entrepreneurial mindset" not only recognize opportunities, but also exploit them in an efficient manner (Mcgrath & Macmillan, 2000). Adopting such a mindset may be achieved through the development of critical entrepreneurial skills and knowledge. Some have argued that there is a lot of literature on knowledge within the entrepreneurial field, but that scholars often fall short of teaching students critical skills and attitudes needed in entrepreneurs (Albornoz, 2008; Chen, Greene, & Crick, 1998).

Chen et al. (1998) suggested that educators should aim at increasing the students' self-efficacy; a construct which is central in the theory of planned behavior (Ajzen, 1991)<sup>1</sup> (TPB). Icek Ajzen, a professor of psychology, introduced this theory in 1991 which depicts the relationship between three antecedents of intentions, intention itself and behavior. Although arguably intended for psychology and social behavior settings, it has been shown suitable for the entrepreneurial setting as it is an intentional concept (Bird, 1988; Krueger, Reilly, & Carsrud, 2000).

Of the three antecedents of intention, self-efficacy stands out in three ways. First, it is possibly the antecedent with the most contradicting results with respect to the intention link.

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<sup>1</sup> Ajzen actually used the term "perceived behavioral control" and not "self-efficacy". Although some have argued they

For instance did Degeorge and Fayolle (2008) even find a negative relationship, calling for further empirical studies on the matter. Second, it is the only antecedent in the TPB which is directly linked to behavior (Ajzen, 1991). Last, the general research community agrees that increased self-efficacy should be one of the goals of entrepreneurship education (Dyer, 1994; Fayolle & Gailly, 2004; Peterman & Kennedy, 2003).

Bandura (1986) described the unfortunate loss of opportunities due to low self-efficacy in situations where the individual in fact has the requisites needed for the undertaking. As a result of the ambiguity of the effects of self-efficacy, this study aims at helping to resolve the contradicting results of the relationships between self-efficacy and intentions and behavior. A better understanding of this concept may help the educational field improve their studies within entrepreneurship, as self-efficacy may be an important key in developing an entrepreneurial mindset. If the relationships are supported, this will bring implications for governments whose goals include economic growth.

There are four ways through which self-efficacy may be influenced; mastery experiences, vicarious experiences, verbal persuasion and emotional arousal (Bandura, 1977). This study will use Venture Cup (VC) as a case for business plan competitions, and investigate the possible links between participation in such programs and increasing one's self-efficacy. VC is a business plan competition held in Norway, Sweden, Denmark and Finland. It is the largest of its kind (Hedner, Edgar, & Cowlrick, 2011) and is organized by non-profit organizations. The reason for using this as a case is that business plan competitions include several of the influencing factors on self-efficacy. Participants get hands-on, real-life experiences when developing the business plan in a realistic context. They are exposed to vicarious experiences through entrepreneurs who serve as role-models as they are mentoring them and giving them feedback. This feedback may also provide positive verbal stimulation to the participants, boosting their self-efficacy additionally.

Business plan competitions may also help in narrowing down the gap between female and male entrepreneurs. Although the number of female entrepreneurs has risen dramatically during the recent years (Bruin, Brush, & Welter, 2006), there are still more new businesses started by men than women in almost all countries (Kelley, Brush, Greene, & Litovsky, 2010). Naturally, as half the world's population is female, this indicates that there is a huge potential which is not yet being utilized.

It has been shown that women have a lower self-efficacy than men (Chen et al., 1998; Forbes, 2005; Koellinger, Minniti, & Schade, 2008; Scherer, Brodzinski, & Wiebe, 1990; Wilson et al., 2007), and some have suggested this being their largest obstacle towards becoming entrepreneurs (Chen et al., 1998; Fielden & Dawe, 2004). If business plan competitions are an efficient means for improving self-efficacy, perhaps these programs could give more incentives

for female participation. Another option is to incorporate initiatives targeted at women to enhance their self-efficacy even more than through today's competitions, e.g. including more female entrepreneurs as mentors and judges. Such initiatives would be relatively cheap and effortless to introduce, which implies that bringing more attention towards the female audience may be an easy way of contributing to more female entrepreneurs, and hence better utilizing the entrepreneurial potential of the entire population.

In order to answer our hypotheses, which will be introduced later, we have conducted a quantitative survey. Consisting of 24 questions, it relates to entrepreneurial intentions, entrepreneurial experience, self-efficacy within various aspects of entrepreneurship, background information about the respondents, and more. The survey was sent out to former participants of VC, as well as to a control group, and generated a total of 834 answers.

This study's contributions are threefold. First, it contributes to the inconsistency in literature concerning the effect of self-efficacy on intentions and behavior. Second, it supports introducing more business plan competitions for organizations concerned with increased entrepreneurial endeavors or increased economic growth. Third, it shows that these competitions are an efficient means through which women may enhance their self-efficacy, providing an approach to increase the proportion of female entrepreneurs.

This paper proceeds as follows: First we introduce relevant theory. Next, the study's methodology is discussed. This is followed by a presentation of the empirical findings, along with a discussion of these. The paper closes with concluding remarks, including theoretical and practical implications.



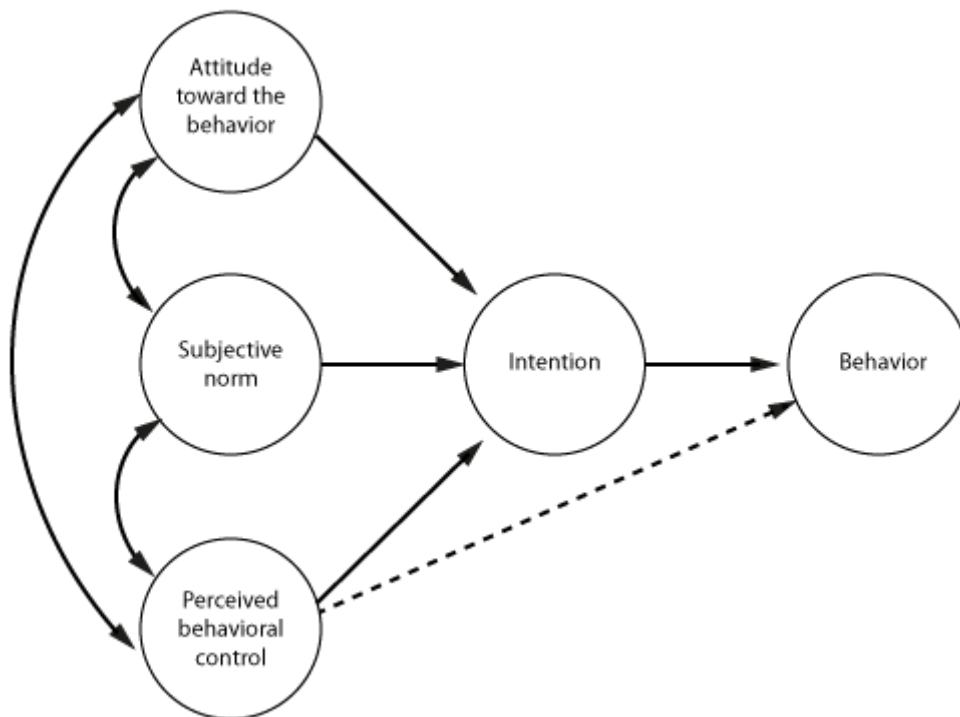
## 2. Literature Review

### The Theory of Planned Behavior

Intentions are interesting because they are a measure of motivation, and they are an indicator of the amount of effort an individual is willing to spend in order to perform a certain behavior (Ajzen, 1991). According to cognitive psychology, “intention is the cognitive state immediately prior to executing a behavior” (Krueger, 2005, p. 109), which enables us to say that intentions predict behavior (Krueger et al., 2000).

As entrepreneurship is an intentional concept, intentions is a key if entrepreneurial endeavors are to be realized, and it has even been argued that intention might be the most important goal of entrepreneurial education (Fayolle & Gailly, 2004). Although there exists several different theories, Ajzen’s TPB (Figure 1) has shown to best predict entrepreneurial intentions (Iakovleva et al., 2011). He argues that there are three conditions which indicate intention; attitudes toward the behavior, subjective norms and perceived behavioral control.

**Figure 1 - Ajzen’s Theory of Planned Behavior**



Attitudes describe a person’s favorable or unfavorable evaluation of performing the specific behavior, based on how the individual considers the outcome and other attributes of

performing the behavior. Social norms illustrate how one perceives the social pressure to perform/not perform a certain behavior. Perceived behavioral control represents a person's perception of the ease or difficulty of performing a certain task, similar to confidence (Degeorge & Fayolle, 2008; Eden & Kinnar, 1991). As it does not necessarily imply predisposition to do something, both internal and external factors may affect it (Degeorge & Fayolle, 2008). The relative importance of the three antecedents of intention varies greatly depending on the specific situation, and in general, the more favorable they are, the greater should the intention be to perform the behavior.

While there have been studies supporting the relationship between intention of becoming self-employed<sup>2</sup> and, respectively, attitude toward the behavior (Kolvereid, 1996b; Lüthje & Franke, 2003; Souitaris, Zerbinati, & Al-Laham, 2007), subjective norms (Kolvereid, 1996b; Kolvereid & Isaksen, 2006; Liñán & Chen, 2009; Lüthje & Franke, 2003; Souitaris et al., 2007) and self-efficacy (Chen et al., 1998; Kolvereid, 1996b; Lüthje & Franke, 2003; Shane & Venkataraman, 2000; Souitaris et al., 2007), there have also been contradicting results; especially those concerning self-efficacy. While Kolvereid and Isaksen (2006) got mixed results on this relationship, Degeorge and Fayolle (2008) even found a negative relationship, calling for further empirical studies on the matter.

Although it has been suggested that these differences have been due to the complexity of the construct (Forbes, 2005; Kolvereid & Isaksen, 2006; Wilson et al., 2007), we want to further investigate this relationship. A better understanding of the effects of entrepreneurial education is important, not only from an academic point of view, but also from a practical one (Lüthje & Franke, 2003). As the potential impact of self-efficacy on entrepreneurial intentions is big, this study aims at contributing to this inconsistency in the literature and to academic institutions. Hence, we propose the following hypothesis:

*Hypothesis 1 (H1):* Self-efficacy will be positively related to entrepreneurial intentions

### **Entrepreneurial Self-Efficacy**

Being able to launch a new business requires a set of different skills and knowledge.

Entrepreneurial self-efficacy (ESE) is a construct which specifically measures a person's belief of successfully doing so (McGee, Peterson, Mueller, & Sequeira, 2009), and increasing it will simultaneously raise the perceptions of venture feasibility (Krueger et al., 2000; Stajkovic & Luthans, 1998). Writing a business plan covers many of the aspects related to how to start a company, and those who develop such a plan are thus likely to possess more of the requisites

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<sup>2</sup> We will throughout this paper use becoming self-employed, becoming an entrepreneur and starting a new business as interchangeable terms for the same phenomena, although Souitaris, Zerbinati and Al-Laham (2007) noted the difference between self-employment (owning a business) and starting a business.

than others. In addition, individuals who compete in business plan competitions often get additional support and knowledge from experts. As they are better aware of what is needed, they are also likely to better recognize their abilities. This could indicate that these individuals would have a higher self-efficacy than the rest.

While the link between entrepreneurial intention and behavior is well-established in both theory as well as being empirically supported (Zhao, Seibert, & Hills, 2005), and will thus not be looked into in this study, studies on the relationship between ESE and entrepreneurial behavior have given various results; some claim that it exists (Chen et al., 1998; Markman, Balkin, & Baron, 2002), while others have found no such relationship (Kolvereid & Isaksen, 2006). Ajzen argued that intention and perceived behavioral control jointly predict behavior, but that the latter does it with lower accuracy, which is the reason for the dashed line in the model.

Lucas, Cooper, Ward and Cave (2009) found that ESE is positively related to venture performance. This further suggests a better understanding of its effect on entrepreneurial behavior is beneficial; not only may it yield more entrepreneurs and new businesses, it is also likely to give better entrepreneurs and new businesses. This makes ESE an even more important factor for economic growth.

If a person has completely volitional control over a behavior, i.e. being able to decide to perform or not perform a behavior at will, intention alone should predict behavior. But when volitional control declines, self-efficacy becomes increasingly more important in determining behavior (Ajzen, 1991). This coincides with Chen et al. (1998) who wrote that the relationship between self-efficacy and behavior is best demonstrated in settings which involve risk and uncertainty. In other words should an entrepreneurial setting be suitable for using self-efficacy as a predictor of behavior.

Even though entrepreneurial intentions have a positive impact on behavior, we believe that entrepreneurial behavior is more important than mere intentions. While actual behavior creates new jobs and drives the economy forwards, intentions alone do not. That is why we would like to further investigate the relationship between ESE and behavior by proposing the following hypothesis:

*Hypothesis 2 (H2):* Self-efficacy will be positively related to having successfully launched a new business

### **Entrepreneurial Education and the Formation of Self-Efficacy**

Entrepreneurial education is a complex matter as the effects might appear at different times, and as the field is highly diversified and heterogeneous (Fayolle & Gailly, 2004). Still, the general

research community agrees that increased self-efficacy should be one of its goals (Dyer, 1994; Fayolle & Gailly, 2004; Peterman & Kennedy, 2003). Unfortunately there has been little research on the various types of entrepreneurial courses and training which exist, resulting in a lack of knowledge in their impact on self-efficacy (Degeorge & Fayolle, 2008). Fayolle and Gailly (2004) did not find a very significant effect, and Cox, Mueller and Moss (2002) even discovered a negative relationship between the two. This indicates a need for studying the effects of such education.

Self-efficacy is a dynamic construct; it will change over time as learning, feedback and experience are acquired (Gist & Mitchell, 1992). Although it has received a lot of attention in the literature, more is known about its consequences than about its antecedents (Forbes, 2005). Furthermore, little is known about the extent to which it may be altered (Gist & Mitchell, 1992). As many have found important effects of self-efficacy, it will be of great interest to know more about how the construct may be influenced. A better understanding of this will enable us to better transform entrepreneurial potential into reality. Not only will this increase the number of first-time entrepreneurs, but a higher level of ESE among existing entrepreneurs will make them perform better (Chen et al., 1998) and be more likely to become “serial” entrepreneurs (Forbes, 2005).

Most of what is known about how to affect self-efficacy was discovered by Bandura (1977). He showed that there are four types of experiences which may influence self-efficacy. The first is mastery experiences, which are previously accomplished tasks. Then there are vicarious experiences, for instance having role models or seeing others succeed. Verbal persuasion is the third way, like support and encouragement from other persons. The last way is emotional arousal, which is the physiological state of the individual.

Courses in entrepreneurship often enable vicarious learning to take place through the involvement of role-models (Zhao et al., 2005), for instance through inviting successful entrepreneurs to the classes (Chen et al., 1998). Educational programs should enhance their inclusion of entrepreneurial role models (Scott & Twomey, 1988), as several studies have indicated the importance of role models on self-employment preferences (Tkachev & Kolvereid, 1999). Another way of increasing the students’ self-efficacy is having these role models, along with the instructors, giving the students positive verbal persuasion (Chen et al., 1998).

Eden and Kinnar (1991) noted that there is a big difference in enabling someone to realize their true potential and knowingly inflating incompetent people’s beliefs in their own competencies. When Cox et al. (2002) found their negative relationship between entrepreneurial education and self-efficacy, they suggested it might be a result of students becoming conscious of difficulties in starting a business which they were previously unaware of. It is thus a question for educators whether to “build steam” or to “burst bubbles” (Wilson et al., 2007).



Yet, it is mastery experiences, similar to “learning by doing”, which is the most important contributing factor to self-efficacy (Bandura, 1977). As a result, simulating real businesses or developing business plans may be efficient ways of increasing it (Wilson et al., 2007), and business plan competitions have been suggested as a way to enhance self-efficacy (Zhao et al., 2005).

Lüthje and Franke (2003) also suggested that learning institutions deployed business plan competitions. They argue that both contextual and personal factors determine to which extent someone develops an entrepreneurial intention and that although someone might have a favorable attitude towards being self-employed, this may be mitigated if the person believes the outer context to be disadvantageous. In this way, the environment indirectly affects self-efficacy; individuals who perceive the environment to be supportive will have their self-efficacy increased, because the perceived obstacles, resources and opportunities are seen in reference to their entrepreneurial capabilities (Chen et al., 1998). As the contextual factors are easier to influence, business plan competitions may be a good tool to increase self-efficacy (Lüthje & Franke, 2003).

We would like to take a deeper look into the relationship between business plan competitions and ESE. Not only may these activities give mastery experiences, as previously suggested, but some involve more of Bandura’s antecedents of self-efficacy. The participants are typically exposed to a jury, giving them constructive feedback, and they often have entrepreneurs or other experts in the field mentoring them. Hence, we get our third hypothesis:

*Hypothesis 3 (H3):* Participation in a business plan competition will be positively related to self-efficacy.

### **The Gender Gap in Entrepreneurship**

Women entrepreneurship has the last years received increased attention from scholars and educators. Many studies have shown a low degree of difference between men and women in terms of survival rate, decision-style, motivation and risk-propensity (Mueller, 2004). Others have indicated differences; women have a lower self-efficacy (Chen et al., 1998; Forbes, 2005; Koellinger et al., 2008; Scherer et al., 1990; Wilson et al., 2007), have less intentions of becoming self-employed (Chowdhury, 2005; Zhao et al., 2005), have less knowledge of entrepreneurship and see more barriers (“Entrepreneurship in Higher Education,” 2009), are more afraid of failure (Kirkwood, 2009; Koellinger et al., 2008; Scherer et al., 1990; Wilson et al., 2007) and are more risk averse (Frederick, 2005) than men.

Females have historically had a lower preference for entrepreneurship (Chen et al., 1998; Kirkwood, 2009), a field generally perceived as male (Wilson et al., 2007), consistent with other

studies on typically man-dominated careers (Scherer et al., 1990). Scholars have found that women in non-traditional occupations have a lower self-efficacy than those who pursue traditional careers (Anna, Chandler, & Jansen, 2000; Wilson et al., 2007), which corroborates with Scherer et al.'s (1990) suggestion that women may exhibit a lower self-efficacy as a result of having less experience and fewer successfully accomplished tasks related to entrepreneurship.

People tend to get drawn towards occupations in which they feel competent, and avoid those in which they feel inefficacious (Chen et al., 1998). Research suggests that women may be shunning entrepreneurial endeavors not because of their lack of skills, but rather as a result of their low self-efficacy (Chen et al., 1998; Fielden, Davidson, Dawe, & Makin, 2003), which tells us that they are likely to be in a greater need than men to develop their self-efficacy and expectations of success (Scherer et al., 1990). To further strengthen these findings, research has shown that women are still avoiding careers in areas in which they are reaching academic parity with men. This indicates that their perceived inefficacies weigh more than their actual background when considering occupations (Bandura, Barbaranelli, & Caprara, 2001).

In order to raise women's self-efficacy, a clear understanding of how this may be achieved is needed, something Kirkwood (2009) explicitly proposed future researchers to investigate. Mentoring, similar to having role-models, have previously been suggested as means for this (Fielden et al., 2003; Scherer et al., 1990). When selecting mentors it is important to consider the target group, as the background of the mentor and the mentee should correspond (Fielden et al., 2003). As an entrepreneur is typically regarded as possessing stereotypical masculine traits (Baron, Markman, & Hirska, 2001), and as female entrepreneurs are under-represented in the media (Kirkwood, 2009), female entrepreneurs should receive more attention.

Verbal persuasion may also be a more effective means to enhance women's self-efficacy than that of men. Fielden and Dawe (2004) found in their study of women in the process of starting new businesses that having had others emotionally supporting them was a key influence to their decision of start-up, as this gave them higher self-efficacy.

Some authors believe it to be unnecessary to investigate gender differences in entrepreneurship instead of focusing on the entrepreneurial process as a whole (Kirkwood, 2009). Mitchell (2011) noted that women entrepreneurship is not a question of gender but one of economic issues, meaning that it is beneficial for everyone to better enable them to create more and larger companies. Our view are more in line with that of Mitchell; although we admit there is a need for better knowledge of entrepreneurship as a whole, we believe that relatively small initiatives may yield great benefits for women entrepreneurship. The behavioral plasticity hypothesis (Brockner, 1985) states that those with low self-efficacy is likely to be more susceptible to environmental influence than those with high self-efficacy. It has been supported

several times (Eden & Kinnar, 1991; Gist & Mitchell, 1992), and implies that less effort is required to boost women's self-efficacy than that of men.

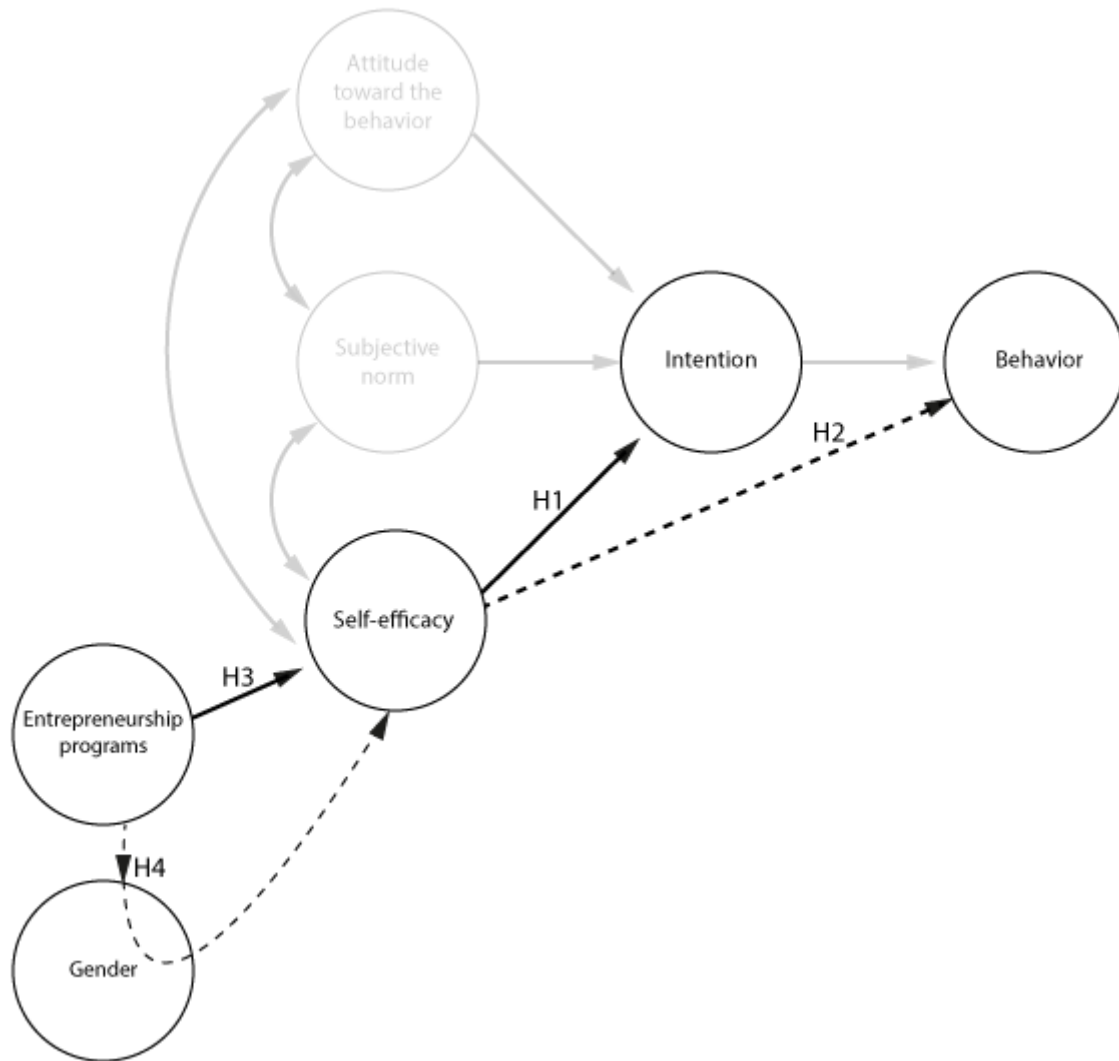
Past initiatives to address the gender problem have been unsuccessful, like those of the UK government which did not increase the number of female entrepreneurs (Fielden & Dawe, 2004). Other governments, such as Norway, have made action plans with concrete goals for the proportion of women among new entrepreneurs ("Entrepreneurship in Higher Education," 2009). Yet, business plan competitions have so far not been considered as means in reaching goals like these ("Se mulighetene og gjør noe med dem!", 2004). As these events already incorporate many of the proposed ways of increasing women's self-efficacy, we believe that they can play an important role in increasing women's self-efficacy, contributing to more female entrepreneurs. Additionally, the literature has suggested that academic curricula adapt better to fit the different needs between the genders, instead of having a general, one-size-fits-all approach (Wilson et al., 2007). Business plan competitions may easily adopt more approaches aimed at women, e.g. increasing female role-models. In such a way, we believe that these competitions may contribute to the process of narrowing down the gender gap, as self-efficacy seems to be women's largest barrier against entrepreneurial endeavors.

*Hypothesis 4 (H4):* Women will have their self-efficacy enhanced more than men through participation in business plan competitions

### **Summation**

We have looked at Ajzen's TPB and showed how there are inconsistencies concerning the effects of self-efficacy. Through our survey, we hope to contribute with valuable results to help resolve these divergences. It has also been pointed out that there is a lack of knowledge concerning the antecedents of self-efficacy, and that its consequences might be of great effect. This study gives a better understanding of the matter by specifically examining the effects of participation in business plan competitions on self-efficacy. A last focus of the study concerns the gender differences in entrepreneurship. As self-efficacy is the largest barrier against more female entrepreneurs, we want to explore how business plan competitions may help in narrowing down this gap. Figure 2 depicts our research model with hypotheses.

**Figure 2 - Research Model with Hypotheses**



### **3. Methodology**

The research design in this paper has been a cross-sectional, explanatory one involving quantitative data from 132 former participants of VC and 593 individuals in a control group. By using a control group, distinctive characteristics of former participants of VC are easier to identify.

#### **Research Setting**

The whole process of making this paper, including the planning of it, has been done in the facilities of NTNU Entrepreneurship Center (NEC). The main focus of NEC is to help start and develop technology-based firms, and is situated at the Gløshaugen campus of the Norwegian University of Science and Education (NTNU). This informal cooperation could have been a possible pitfall, as NEC is highly involved in the organization of VC and thus could have resulted in a biased view. Nevertheless, the authors feel that this setting has, if anything, been a positive contribution through invaluable inputs and discussions. It should be noted that all formal work has been done by the authors alone.

The choice of selecting the region VC Mid-Norway as our case was a result of several factors. First, the business plan competition contains the largest number of participants of all the regions, and most of the contributions stem from NTNU. Second, as both authors of this study are of the same university, addressing former participants from this institution could give credibility. Third, by working on a study containing many former participants of VC from NTNU, NEC gave us several privileges such as an office, sponsored prizes, valuable discussions, and support with conducting surveys, using SPSS and analyzing data. Last, having access to alumni information from the university made the creation of an appropriate control group feasible.

The rationale for focusing on one single competition was twofold. As the various regions do not organize the business plan competition in the exact same way, studying several could prove difficult and provide low comparability. Additionally, including other regions could have implied a need of more time than we had at our disposal for this thesis.

#### **Sampling**

##### **Literature**

Through the help of our counselor and an acclaimed researcher in the field of intentions, a list of articles and relevant authors was provided. Browsing through these documents gave a good overview of the literature, and also proved as a great way to start snowballing. Snowballing,

or chain referral, is a technique where one starts with a few samples which spread to other links connected to the original ones (Neuman, 2006). These articles have been accessible using several electronic databases through our learning institution. The primary source has been Google Scholar, which includes most of the renowned scientific journals within relevant fields such as entrepreneurship, business and management. Although snowballing is an efficient means to quickly gather much information on a specific field, it is a biased way of collecting data as the referrals do not always represent all the aspects of a case (Blankenship, 2010). To prevent this we also made use of keyword searches. By combining different terms, relevant articles appeared. Although citations do not necessarily indicate quality, articles with a high number of citations were usually preferred.

### **Population**

This paper includes two samples based on judgmental sampling. This is a type of non-probability sampling where certain criteria have been put forth, instead of everyone in the population having the same probability of being selected (Marshall, 1996).

The first sample includes former participants of VC, and was made from a list of 302 former participants from the Gløshaugen campus and from the Faculty of Medicine who participated sometime between 2003 and 2011. The contact information was not provided for all the individuals, and the missing information was obtained online if possible. As the survey was to be sent via email, persons whose phone number was available but not their email address, were contacted and asked to kindly provide this after introducing them to the survey and its purpose. In the end, the number of the sample ended up being 240. After having sent two email reminders to the non-respondents, answers were given by 113 individuals, yielding a response rate of 47.1%.

The paper's other sample is a control group, and two criteria must be met in order to be eligible for this group; belonging to institutes of the Gløshaugen campus or to the Faculty of Medicine, and having graduated between 2003 and 2011. This way we got a different group with similar educational background to the former, both in terms of major as well as in time. The survey was sent out to 6 720 graduates, this time without any reminders. Responses came back from 721 individuals, giving a response rate of 10.7%.

As it turned out that some from the first sample in fact had never attended the competition, and vice versa, the number of former participants ended up being 155, while the control group contained 653 responses. 26 individuals left the survey before getting to this question, which is why these two numbers do not add up to 834 which was the number of replies given.

We wanted the study to stand out in the way of focusing on a specific group of individuals, which is why we chose judgment sampling by removing those who were not students of engineering. This way, the sample would consist of solely technical graduates, a group which is more inclined than others to develop new businesses in dynamic and innovative areas, spurring economic growth and new jobs (Lüthje & Franke, 2003). The elimination of these would give a more homogenous group. Of those removed, 23 had participated in VC, 60 had not, and one individual did not get to this question. The final number of responses used for the analysis thus became 132 former participants and 593 in the control group.

## **Data Sources**

This study only contains a single source of data; quantitative data from the survey sent out to both former participants and non-participants of VC. Surveys are, according to Yin (2009), suitable when aiming at explaining predictors of certain phenomena, which is exactly the essence of this study.

When designing the survey, we considered several factors. We had looked at several articles on entrepreneurial education, especially that of Vegar Johansen (2011), to get an impression of which questions to include and how to pose them. Furthermore, the NEC staff had previously conducted similar studies, and these were taken into consideration as well. Professor Emeritus Sigmund Waagø contributed additionally by giving us valuable inputs and comments.

Our survey consisted of 24 questions, of which only 20 were applicable to the non-participants. The majority were either evaluative questions where a 5-point Likert scale was used, or was on a multiple choice-form with only a single answer being possible. One problem with the use of Likert scales is that there is no rule of whether to interpret it as a nominal, ordinal or continuous scale. It has been argued that Likert scales are of an ordinal form, with answers of the type “strongly agree” having different meanings from person to person, making it difficult to justify the use of metric analysis methods. However, Dolnicar and Grün (2007) found, after using varimax rotation, that the metric and ordinal (Likert) formats had an average correlation of 0.99 for behavioral intentions, indicating that it is not significant for this setting which format is used. Hence, we approximate our Likert scales as metric scales.

Questions were grouped together according to their type, and they were carefully ordered. Background questions were given first, while more probing and evaluative questions came later in the survey. Except for the last two questions which were not relevant for the study, all applicable questions were compulsory.

The survey was sent out to the respondents through email, and was open for answers for a total of 32 days. In addition to containing a link to the survey, the email included an

introduction to the survey and its purpose, how the recipients had been chosen, an estimate of the time needed to complete it, and the people behind the study and their contact information (Appendix A). We guaranteed their anonymity, and offered two raffle prizes to obtain a high response rate.

The control group was not cross-checked with our list of former participants of VC. As a result, the email sent out to the control group may have reached some who had already received the survey. However, a process of double-checking this would be very time consuming, if feasible at all, and would not be worth the effort. Moreover, it is unlikely that anyone receiving the same survey twice would respond to it a second time.

### **Data Analysis**

For analyzing the data gathered, SPSS 18.0 was used. Without such a tool, the large amount of data would have been difficult to process. SPSS contains several statistical programs and is widely used as an advanced and complex tool for analyzing data (Morgan & Griego, 1998).

To test relationships between various variables, bivariate correlation tables were used. Bivariate are often used for explanatory purposes (Babbie, 2010), making it well-suited for this study. The Pearson coefficient ( $r$ ) was chosen for correlations, and the test of significance was two-tailed. When mean values were to be calculated and compared with each other, independent samples t-tests were used.

In order to prevent the possibility of having found spurious relationships, we tested for control variables. This was done in spite of that several authors, according to Tkachev & Kolvereid (1999), have argued that demographic variables only indirectly may predict intentions through their effect on attitudes, subjective norm and self-efficacy. Controlling for third variables ensures a higher internal validity of the study (Yin, 2009). For Hypotheses 1 and 2, controlling was done as follows: An independent t-test was conducted where the dichotomous intentions and behavior variables were respectively set as the test variable, and the dummy self-efficacy variable was used for grouping. The sample was then split in two, based on which control variable was used, thus creating two subsamples. If a test within any subsample did not show any statistically significant differences, this was commented as it could be a sign of having found a spurious relationship. The same procedure was used for Hypothesis 3, having self-efficacy as the test variable and participation in VC as the grouping variable. The last hypothesis had such a small sample size that testing for spurious relationships proved difficult.

### **Entrepreneurial Self-Efficacy**

Entrepreneurial self-efficacy was measured using a 8-item 5-point Likert scale (Q19, Appendix A) where we asked the subjects to rate to which extent they had knowledge within various areas related to starting a new company, in addition to a single-item 5-point Likert scale



asking for a more general evaluation of the same (Q20, Appendix A). Respondents could give answers from 1 (*very little extent*) to 5 (*very great extent*), and overall score was measured using the average of all responses.

When controlling for third factors was done in cases which included self-efficacy, the responses were in most cases manipulated into a dummy variable. Answers ranging from 1 through 3 were coded as 0 (*low self-efficacy*), while those answering 4 or 5 were coded as 1 (*high self-efficacy*). To ensure that the measure of self-efficacy is reliable, we calculated the Cronbach's  $\alpha$ , including the 9-item scale and the dichotomous self-efficacy construct. Although not common to apply both scales and dichotomous variables when calculating the Cronbach's  $\alpha$ , this may be done (Santos, 1999). This gave a Cronbach's  $\alpha$  of 0.957, well above the accepted value of 0.70 (Lance, Butts, & Michels, 2006), indicating a high reliability. It should be noted that including several items increases the score (Streiner, 2003), but when measuring something as complex as entrepreneurial self-efficacy, covering several aspects is essential (Wilson et al., 2007).

### Intentions

To measure entrepreneurial intentions, a 2-item 5-point Likert scale was used. The respondents were asked how probable it is that they will launch a new business within two years (Q22:1, Appendix A), in addition to the likelihood of doing so any time after those two years (Q22:2, Appendix A); a measure close to that of Lüthje and Franke (2003) and Wilson et al. (2007). Choices ranged from 1 (*very low probability*) to 5 (*very high probability*).

To consider the answers given to both questions at the same time, we wanted to recode them into one construct. In addition, two years ahead in time would for some students not be sufficient time to have finished their degree. Hence, even if these students had intentions towards establishing a new business after their degree, they would have to choose having a very low probability of doing so within two years. This would indicate a low intention, and as such, it is of our opinion that adding the values from the two questions would not make sense. Moreover, the authors believe that intention is not a matter of time, rather than one of attitude, which supports the consideration of both questions. As a result, we coded the intention answers into dummy variables, as may also be seen in the study by Wilson et al. (2007). Respondents giving answers of 4 to 5 on either question were coded as 1 (*high intention*), and the others were coded as 0 (*low intention*). To make sure the measures were reliable, Cronbach's  $\alpha$  was calculated, including the two scales and the constructed dummy, yielding a score of 0.806.

### Behavior

Respondents were asked if they had ever tried to launch a new company, alone or with someone else (Q18, Appendix A). They could choose among six alternatives, of which three indicated that the respondent had in fact started a business at some point in time. Hence, a dummy variable was needed. Those who answered among those three alternatives were coded as

1 (*yes*), while those who had not yet launched a company were coded as 0 (*no*). Hence, individuals in the process of establishing a business were not considered as having an entrepreneurial behavior. The authors believe that testing for reliability within this construct was not necessary, as the question is a simple, non-evaluative one where it should be obvious which alternative to select.

### Control Variables

**Gender.** Men were coded as 1, women as 0.

**Age.** Those over the age of 30 were coded as 1, the rest as 0.

**Origin.** Respondents were asked about their birthplace as well as that of their parents. Those who were born in Norway along with both their parents were coded as 1, the rest were coded as 0.

**Parental background.** We asked the recipients if any of their parents had at some point in time been self-employed. Those answering yes to this question were coded as 1, otherwise 0.

**Pre-university exposure to entrepreneurship.** We wanted to check the respondents' previous involvement with entrepreneurship, and included five measures. "Young Entrepreneurship" is a Norwegian organization whose goals focus on the youth and on developing their creativity and eagerness for innovation. It includes projects and courses in middle school and high school. Other alternatives were having had entrepreneurial, economic or administrative subjects, project work, a summer or part time job in a private business, or a summer or part time job in a public organization. Exposures to either of these were coded as 1, and 0 otherwise.

**Participation in innovation programs.** In addition to VC, the questionnaire asked the recipients for participation in three other programs. Take-Off is similar to VC, but the time frame is shorter and the participants work with an idea from an existing business. "Gründerskolen" involves a three month long stay abroad, with an internship as well as having classes. NTNU School of Entrepreneurship (NSE) is a practical two-year Master's program with a focus on teaching commercialization of technology. Participation in either of these programs were coded as 1, otherwise as 0.

### Criticism

As noted, this is a cross-sectional study. This method is, although perhaps more used in exploratory and descriptive purposes, used in many explanatory studies. The main problem with cross-sectional, explanatory studies is their aim of understanding causalities which occur over time, while focusing at a single point in time. For quantitative studies like this one, using a longitudinal approach may prove difficult, although it is often the best alternative (Babbie, 2010). In this case, such an approach was not feasible due to time constraints. We urge, however, future researchers to deploy such studies with the same aims as this one to ensure more generalizable results.

The units observed in a judgment sampling are selected based on the assessment of the researchers, either finding the sample being the most representative or useful, but non-probability sampling methods cannot guarantee representability (Babbie, 2010). On the other side, having a large and homogeneous sample increases the statistical conclusion validity of the study. And while the results of this study may not be generalizable to other groups, it is likely to be representative for technical graduates.

Another weakness with this study is the possibility of recall bias as the VC-specific questions required the respondents to recall events which occurred in the past, possibly going back as long as 9 years. However, this issue is related with that of the study being a cross-sectional one. As it was not possible for the authors to conduct a longitudinal study, including questions concerning past events was a way of approximating observations over time (Babbie, 2010).

An interesting question concerns the self-efficacy of the former participants prior to participation, as the study did not ask about this. Such a question would have given an interesting contribution to the study of the effect of the competition, as it is not unlikely that those entering a business plan competition differ from those who do not. These may already have better knowledge, skills and self-efficacy than the rest. However, besides the complexity of the construct itself, trying to account for this could also have introduced additional measuring problems; it seems likely to assume that for those who participated several years ago, a correct evaluation of their self-efficacy at that point would prove hard. Further is it possible that these would have over-evaluated their pre-self-efficacy as a result of being accustomed to having a high self-efficacy today.

Several authors have noted the complexity of the self-efficacy construct. It plays a major role in this paper, and it is not unlikely that the questions in this study have not captured all the aspects of the construct. Additionally, skills were not taken into consideration; the focus was solely on knowledge, which may have been unfortunate as becoming an entrepreneur is not only about what you know, but also being able to put that into practice. The authors still believe that the measures used are suitable for analyzing self-efficacy.

It could be argued that there should have been more items probing for entrepreneurial intentions, to ensure a higher reliability, as only measures were used in this study. However, we believe that the intention measure is sufficient for this study.

A potential weakness is that the study has assumed entrepreneurial behavior being equal to self-employment. This excludes occupations such as teachers, researchers or consultants who are working indirectly with entrepreneurship (as noted by Kolvereid and Moen, 1997).

The question 22 (Appendix A) might have been source of error in certain cases. Those who currently are pursuing an opportunity and those who already are self-employed may have given an answer indicating low or even no intention of starting a business merely because they are in no position at the moment to do so. Although we have included a question dealing with barriers to becoming an entrepreneur, it does not cover enough aspects to being able to correct for this possible error. Thus, the mean intention is likely to have been higher if the question had been phrased better. Kolvereid and Moen (1997) also noted that it would be “meaningless to ask the self-employed about their intentions to become self-employed” (p. 157).

## 4. Findings and Discussion

In this part, the results of the hypothesis tests will be presented, immediately followed by a discussion after each hypothesis. This study has used explanation building (Yin, 2009) by using literature and the authors' own reflections in order to explain the various outcomes.

**Table 1 - Bivariate Correlation Table**

Variable	Mean	SD	N	1	2	3	4	5
1. Gender	0.76	0.43	738	1				
2. Age	0.48	0.50	738	0.09 *	1			
3. Background	0.91	0.28	738	-0.03	0.06	1		
4. Self-employed parents	0.40	0.49	738	0.05	-0.03	-0.10 **	1	
5. Young Entrepreneurship	0.05	0.22	738	0.00	-0.09 *	-0.09 *	0.04	1
6. Entrepreneurial subjects	0.24	0.43	738	0.07	-0.04	-0.02	0.04	0.12 **
7. Projects	0.41	0.49	738	-0.03	-0.05	-0.04	0.02	0.02
8. Private job	0.85	0.36	738	0.03	-0.03	-0.01	0.10 **	-0.03
9. Public job	0.38	0.49	738	-0.13 **	-0.01	-0.01	-0.06	0.00
10. Participation in VC	0.18	0.39	725	0.08 *	0.01	-0.06	0.07	0.13 **
11. Take-Off	0.11	0.32	725	0.01	0.07	-0.10 **	0.02	0.04
12. Gründerskolen	0.07	0.26	725	-0.01	0.02	-0.10 **	-0.02	0.03
13. NSE	0.04	0.19	725	0.09 *	-0.04	-0.04	0.00	0.05
14. Self-efficacy	2.48	1.01	706	0.19 **	0.10 **	-0.06	0.12 **	0.09 *
15. Intentions	0.44	0.50	699	0.29 **	0.06	-0.04	0.14 **	0.05
16. Behavior	0.21	0.40	706	0.21 **	0.06	-0.01	0.12 **	0.13 **

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\*. Correlation is significant at the 0.01 level (2-tailed).

6	7	8	9	10	11	12	13	14	15	16
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1										
0.25 **	1									
0.05	0.19 **	1								
-0.04	0.10 **	-0.01	1							
0.09 *	0.05	0.09 *	-0.08 *	1						
0.17 **	0.07 *	0.04	-0.03	0.39 **	1					
0.17 **	0.05	-0.01	-0.04	0.37 **	0.48 **	1				
0.07 *	0.06	0.04	-0.06	0.38 **	0.35 **	0.47 **	1			
0.25 **	0.13 **	0.13 **	-0.06	0.46 **	0.41 **	0.33 **	0.27 **	1		
0.14 **	0.10 **	0.08 *	-0.08 *	0.27 **	0.23 **	0.15 **	0.18 **	0.44 **	1	
0.11 **	0.06	0.11 **	-0.08 *	0.32 **	0.30 **	0.19 **	0.23 **	0.46 **	0.33 **	1

## **Hypothesis 1**

Bivariate correlation shows that there is a significant correlation between self-efficacy and intentions ( $r = 0.44$ ,  $p < 0.01$ ,  $N = 696$ ). An independent t-test was also conducted between the intention dummy and the self-efficacy scale. The result demonstrates a significant difference in self-efficacy between those with high intentions (mean = 2.98) and low intentions (mean = 2.09) ( $t = 12.72$ ,  $p < 0.001$ ,  $df = 694$ ). No statistically significant differences is found between the intentions of those with low versus high self-efficacy among students of the NSE ( $p = 0.24$ ), but the mean difference between the groups is rather large (0.28). There were only 26 individuals with an NSE and VC background in this analysis, which is likely to have contributed to the lack of significance. As such, the authors believe there to be sufficient evidence to give support for Hypothesis 1.

The result from the test is not particularly unexpected, as several studies have indicated that this very relationship exists. It implies not only that self-efficacy is an antecedent of intentions, but the strong coefficient indicates that the relationship is strong. Consequently, perceiving that one with ease is able to start a new business leads to entrepreneurial intentions. Conversely, it seems logical that if one has a lack of belief in the ability to perform a certain behavior, this would not make that person have a higher intention towards executing that behavior.

## **Hypothesis 2**

Testing the relationship between self-efficacy and behavior using bivariate correlation tables, shows that it is significant ( $r = 0.46$ ,  $p < 0.01$ ,  $N = 706$ ). A t-test was conducted to verify the result, comparing the self-efficacy of those with and without entrepreneurial behavior. The t-test is supportive ( $t = 13.83$ ,  $p < 0.001$ , mean difference = 1.15,  $df = 704$ ).

Being a student of the NSE does not yield any statistically significant differences between the behavior of those with low versus high self-efficacy ( $p = 0.08$ ), although the mean difference between the groups is noticeable (1.00). This lack of statistical significance is likely to be caused by the fact that there were only 27 students of this school responding to the question, of which only 9 reported not having an entrepreneurial behavior. As this divergence may be the result of the small sample sizes, and since all other control variables give consistent results with the first tests of the hypothesis, Hypothesis 2 is deemed supported. When individuals involve themselves in entrepreneurial endeavors, it is likely that they are exposed to mastery experiences, and possibly also other of Bandura's antecedents to self-efficacy. This result is thus reasonable.

Another finding was discovered when comparing those with entrepreneurial behavior against the rest; the mean difference in self-efficacy was higher among women (1.30,  $N = 171$ ) than men (1.08,  $N = 532$ ). As the female groups had a lower self-efficacy than the male groups,

this suggests a support for the behavioral plasticity hypothesis. However, it should be noted that only ten women indicated having an entrepreneurial behavior, and having increased this number may have yielded a different result.

Even more interesting is the large correlation found between self-efficacy and behavior, which was stronger than the one between intentions and behavior (0.46 vs. 0.33). This contradicts Ajzen's theory, in which he states that intention is the better predictor of the two. Our final Figure 3 has taken account for this unexpected finding, by making the dashed line solid. The result could, however, be a result of our intentions measure, as is elaborated in the methodology criticism.

### **Hypothesis 3**

Table 1 shows that participation in VC significantly correlates positively with self-efficacy ( $r = 0.46$ ,  $p < 0.01$ ,  $N = 703$ ). An independent t-test corroborates this result ( $t = 13.81$ ,  $p < 0.001$ , mean difference = 1.22,  $df = 701$ ) and shows that these participants have significantly higher levels of self-efficacy than the rest, indicating a support for Hypothesis 3. Controlling for background variables does not show any deviation.

As business plan competitions easily may involve several of Bandura's four antecedents to self-efficacy, this may explain the outcome. Developing a business plan enables participants to get hands on experience, or mastery experience, the most important contributor to self-efficacy. Further, there are plenty of vicarious experiences through the entrepreneurial mentors present. The people in the jury judging the contestants are professionals who also serve as role models. Both these, as well as the mentors, may contribute through inspiring participants to increase their belief in themselves.

### **Hypothesis 4**

Table 2 shows the self-efficacy for women and men, grouped after participation in VC. Men have overall a higher self-efficacy than women for both former participants and non-participants. Of non-participants, there is a significant difference between men's and women's self-efficacy ( $t = 4.46$ ,  $p < 0.001$ , mean difference = 0.37,  $df = 577$ ). However, among the ex-participants it is not even close to producing a significant difference ( $t = 0.84$ ,  $p = 0.40$ , mean difference = 0.18,  $df = 122$ ). Given the small sample size of former women participants of VC, it was difficult to statistically control for other variables. Although this study cannot claim causality, we still argue that Hypothesis 4 is supported.

**Table 2 - The Effect of Participation in VC on Self-Efficacy**

Participation in VC	Gender	Mean	SD	N
No	Male	2.36	0.89	427
	Female	1.99	0.89	152
Yes	Male	3.51	0.87	105
	Female	3.33	0.64	19

The gap between the genders in terms of self-efficacy was reduced by half for former participants, and it indicates that the women who participate have their self-efficacy more affected. The result may be explained through the plasticity hypothesis, as women in general are a group with lower self-efficacy than men. Hence, exposing them to mastery experiences and other antecedents of self-efficacy through participation in a competition, yields self-efficacy.

As such, to obtain a higher number of female entrepreneurs, their largest barrier must be diminished; the low self-efficacy. Especially is this valid for the entrepreneurial field, as it is one typically perceived as being male. It is unfortunate when opportunities are not recognized as a result of self-efficacy when the individual in fact has the requisites needed to exploit it.

Having more female entrepreneurs is likely to create an upward spiral for women entrepreneurship. Little by little, as they take a larger part of the entrepreneurship world, the perception of the field being dominantly male will diminish. The result will be more women being open to this occupation, spurring even more female entrepreneurs through the field being further less male-dominant, as well as having more women serving as role models.

Mentors and role-models are likely to have a higher influence on women, as they are usually not exposed to the same amount of these stimuli as are men. If there had been a larger contribution from female mentors and role-models in VC, the results would have been likely to suggest an even stronger support for Hypothesis 4. Those who argue that it is more important to focus on entrepreneurship as a whole before investigating gender differences, should note that introducing more female role-models may be done without significant financial expenses, and possibly even without much other effort.

A possible explanation for the lack of a significant difference between the genders among former participants may be explained through the sample size. There were substantially fewer former participants than non-participants, especially was number of former female participants low. As larger samples more easily yield statistically significant differences, a larger sample may have given a different outcome.



## **5. Implications and Conclusion**

This section is dedicated to the main conclusions of the paper. The implications of the findings are discussed, for further research as well as for practitioners. Last, limitations, a final conclusion and acknowledgements are presented.

### **Implications for Further Research**

The study's support for both Hypothesis 1 and 2 strengthens the TPB, and specifically contributes to Fayolle and Degeorge's call for more empirical evidence concerning the link between self-efficacy and intentions. Further, the behavioral plasticity hypothesis is also supported by our findings, as we found that women have lower self-efficacy and have this construct more easily influenced than men through participation in business plan competitions.

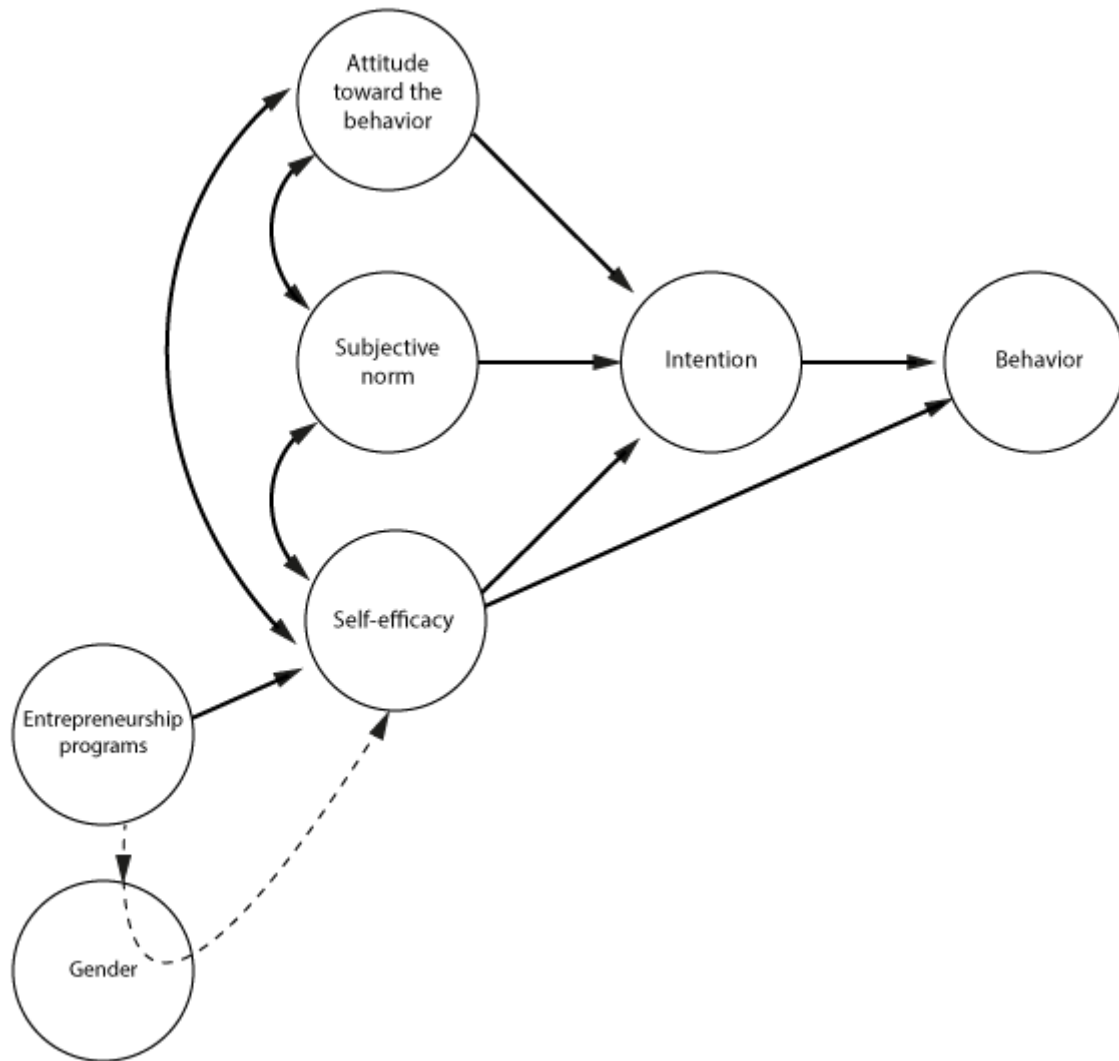
Ajzen argued that intention is a better predictor of behavior than self-efficacy, yet our results indicate the opposite. Considering the popularity and credibility of TPB in the domain, this finding is of great interest. This could be a case of coincidence as this study is a single-case one, but it is a finding which should be investigated more closely. If the findings are supported, it would have implications for the future of the model itself.

Although some researchers have already suggested that making business plans may be an efficient way of enhancing self-efficacy, we are in the opinion of that too few studies have tested this relationship empirically. Especially as the findings of this study provide support for the relationship, we call for more studies on the matter. Future studies may also find it interesting to investigate whether business plan competitions enhance the performance of businesses started by former participants, as self-efficacy has been linked to increased performance, and business plan competitions could thus prove to be even more beneficial to the society.

To better address the differences in entrepreneurial self-efficacy among the genders, a longitudinal study should be conducted as a limited number of studies have focused on when and why these differences emerge. An improved understanding may be achieved through studying students of each gender at an early stage, and following them through their academic career as well as the beginning of their professional career. The results could be used to diminish the gender gap in entrepreneurship and possibly contribute to other fields which also are subject to these differences.

While we call for more research to support our findings related to Hypotheses 3 and 4, on the basis of our results, we propose a modified model of the TPB which can be seen in Figure 3.

**Figure 3 - The Final Proposed Modified TPB**



### **Implications for Practitioners**

This study contributes to practice at three levels. First, self-efficacy is a construct that should be better addressed by those interested in achieving increased entrepreneurial intentions and behavior. Second, business plan competitions are a means through which self-efficacy can be enhanced, and as a result deserve more attention. Third, educators should note that as enhancing women's self-efficacy may increase the number of female entrepreneurs, this may be achieved through relatively effortless initiatives.

Since the results have shown that self-efficacy directly affects entrepreneurial intentions and behavior, and as the link between intentions and behavior already has been proved, those whose goals include increased entrepreneurial intentions and endeavors should take note. For these organizations, an increased focus on self-efficacy is suggested. As self-efficacy additionally

is positively related to venture performance, it has more practical implications for the society than simply that of creating more businesses and employment. Therefore, although there are other means through which one can increase entrepreneurial behavior, self-efficacy brings about more additional favorable outcomes. As individuals whose self-efficacy is high already are more inclined towards becoming entrepreneurs, an initial screening of the candidates with respect to their self-efficacy may be beneficial to ensure a maximum enhancement of intentions through the program.

It has been shown that participants have their self-efficacy enhanced through business plan competitions. As there has been a dispute regarding the actual effect of these events, organizers may use these findings to justify their contribution. The results may also be used as leverage towards potential investors and sponsors of such competitions. We encourage other learning institutions, especially those of science and technology, which do not yet offer business plan competitions, to benefit from these results through introducing these events. As there is a myriad of different entrepreneurship courses and training, this initiative stands out as being one of few having empirical backing.

An increased number of entrepreneurs will yield more jobs and higher economic growth, making it a subject of interest for governments. Especially is the link between self-efficacy and behavior important, as the economic contribution by entrepreneurs are dependent on more than mere intentions, and especially as the study found self-efficacy to be the better predictor of behavior. Considering the link between self-efficacy and performance found by others makes it even more interesting. We thus recommend governments to provide more incentives to learning institutions to enhance self-efficacy, including stimulating more and better business plan competitions; e.g. through providing financial support and offering industry experts or political role-models.

The low proportion of female entrepreneurs represents a huge, unrealized economic potential, which first and foremost is impeded through a lack of self-efficacy. In addition to introducing more business plan competitions to address this, we believe that bringing in more females as mentors or members of the jury will stimulate female participants through having role models that they more easily connect themselves with. As business plan competitions have a stronger effect on the self-efficacy of women, and as self-efficacy yields more and better entrepreneurial endeavors, we also suggest that organizers consider initiatives to boost the part of female participation. These suggestions should be of special interest for institutions and governments which have already had unsuccessful measures related to increasing female entrepreneurship.

## **Limitations of the Study**

This study has solely focused on one business plan competition. However, to make a study replicable, one should have at least two different cases supporting the same theory (Yin, 2009). Thus, this study cannot claim this result to be generalizable until future studies have tested our Hypothesis 3 for other cases. As a result, we urge future researchers to use other business plan competitions to test if the same relationship with self-efficacy is found.

Another limitation concerns the possibility of self-selection bias among the former participants of VC. It is hard to determine whether these individuals possessed different characteristics than those of the control group even before participation in VC, or if the differences occurred as a result of participation. Student entering such a competition may already have had a larger interest in the subject and as a result had a different starting point than the rest. The same situation may have arisen when studying the gender differences in Hypothesis 4. Longitudinal studies should be conducted to mitigate this problem.

## **Conclusion**

This paper has showed that self-efficacy is an important construct that is positively related to intentions and behavior. Business plan competitions provide a means through which this construct may be influenced, and the concept deserves increased attention from learning institutions as well as governments. As they have been shown to increase the self-efficacy of women more than that of men, they could be used as a tool to diminish the gender gap in entrepreneurship, and can even be further modified to better adapt to the needs of women. Hopefully, future researchers will investigate more closely when and why these differences in self-efficacy between the genders emerge.

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## **Paper 2**

### **How May Business Plan Competitions Better Increase Entrepreneurial Intention?**

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## Abstract

**Purpose** - This study aims to identify which field of knowledge acquired when participating in a business plan competition contributes most to increased entrepreneurial intention and involvement. The purpose of this paper is to contribute with a new perspective on entrepreneurial education curriculum content.

**Design and methodology** - A total of 132 former engineering students who have formerly participated in Venture Cup Mid-Norway participated in this study by responding to an electronic questionnaire. Comparison of means and correlation tests was used to analyze the collected data.

**Findings** - The findings show that some learning modules contribute more to increased entrepreneurial intention than others. These are: customer identification, investment presentation and business plan structuring.

**Research implications** - This study contributes to expand the theory of planned behavior, by adding an additional predictor; the domain knowledge obtained during a business plan course. A more substantial model will make future entrepreneurial behavior studies more reliable by having more fine-grained antecedents to build the prediction on.

**Practical implications** – The findings in this study makes it possible to differentiate the various learning modules in the open-ended contingency model. This will help faculty staff in better utilizing their resources by more easily being able to prioritize the various learning modules.

**Keywords** – Theory of planned behavior, entrepreneurial intention, entrepreneurial involvement, contingency model, learning modules, entrepreneurship education

**Paper type** – Research paper



# 1. Introduction

Efforts to promote entrepreneurship in higher education is a priority area for the Council of the European Union (“Entrepreneurship in Higher Education,” 2009), and entrepreneurship in particular is emphasized as a key competence in making the European workforce better equipped to deal with increased global competition. Entrepreneurship and innovation are concepts that particularly during the last 10 years have gained a foothold in Norwegian universities and colleges (“Entrepreneurship in Higher Education,” 2009). In 2011, 28 out of 39 public universities and university colleges in Norway offered entrepreneurship courses (Services Norwegian Social Science Data, 2012).

Course content varies widely, ranging from formal lectures to the establishment of a legal entity, stemming from the American model of entrepreneurship education (Gorman, Hanlon, & King, 1997). One of the most popular curriculum formats consists of a hands-on model where students develop a business plan for their business idea. In a study of educational entrepreneurship in the top 100 universities in the United States, it was found that 78 offered courses based on the development of a business plan.

These courses are often offered in conjunction with business plan competitions, organized by the universities themselves and sponsored by private companies. This cohesive approach, where commercial players and formal educators evaluate the business plan, has been a leading model in all the Scandinavian countries under the name Venture Cup (VC). Since 1998, over 12 000 business plans has been evaluated in VC Sweden, turning 32% of these into viable businesses and employing 11 500 in total (NEC & Start Norway, 2012). The main mission statement of VC is to broaden the interest and knowledge about entrepreneurship for students, regardless of field of study.

Despite the broad use of business plans as a foundation in most competitions, there have been few theoretical studies to support the activity (Honig, 2004). Given the universal diffusion of entrepreneurship education, not many scientific articles have dealt with the impact of course content on entrepreneurial activities (Gorman et al., 1997). Thus, few empirical findings exist which evaluate and make suggestions for change within the pedagogical design of entrepreneurship education.

Advocates for business plan teaching mostly originate from the strategic planning camp (Armstrong, 1982) building their case on the need for eliminating guesswork and assist in interpretation of data. Seen from an effectuation-causation point of view, this camp resides in the latter (Sarasvathy, 2001). Opponents of this view argue that an effectuation mindset is more linked to the entrepreneurial reality, and that the pedagogical framework should be designed

accordingly (Honig, 2004). One proposal, namely the contingency model, is to modify the linear close-ended business plan process with a more open-ended dialectic approach. More closely attuned to a framework incorporating effectuation, the contingency model lets the students choose the learning modules of importance at a given moment, encouraging them to pursue divergent thinking.

Based on a review of entrepreneurship education literature, we propose a new perspective on the alternative open-ended framework posed by Honig (2004). We anticipate a difference in the learning effect of the different topics taught during the business plan course, and that this effect can be measured in entrepreneurial intention and activity.

With this background, we set out to explore: “Which field of knowledge acquired when participating in a business plan competition contributes most to increased intention and entrepreneurial involvement?”

To shed light on this research question, we have conducted a multidisciplinary quantitative study, with 132 former VC-participants as respondents. The survey consisted of 24 questions, ranging from background info to concrete entrepreneurial experience. The findings from our empirical study show that some learning modules have a significant correlation with increased entrepreneurial intention. These include customer understanding, packaging of concept and an understanding of funding channels.

The implications of this study are twofold. Firstly, the findings in this study suggest a correlation between some of the learning modules and increased entrepreneurial intention, yielding a contribution to the theory of planned behavior (Ajzen, 1991). Secondly, we propose a list of prioritized learning modules to be used with the contingency model. The model’s descriptive nature makes it adaptable for existing entrepreneurship courses, and should be of interest for relevant faculty staff.

The article is structured as follows: Literature Review exposes the two challenging perspectives; effectuation and causation, on business plan based education. This is followed by the methodology chapter, in which it is given an insight into the methods used to conduct the study. In Findings and Discussion we will take a closer look at the most interesting results and suggest possible explanations for the phenomena in question. In the last chapter we will point to the practical and theoretical implications following from this study.



## 2. Literature Review

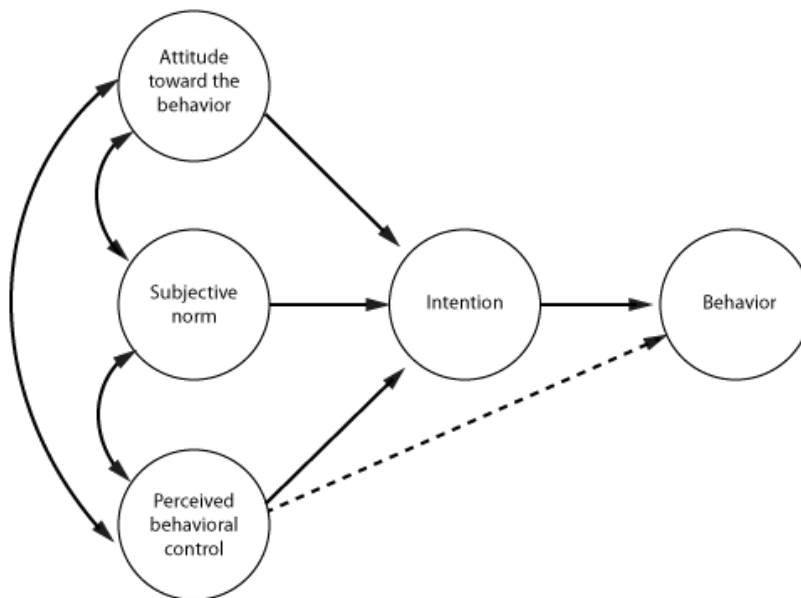
### Entrepreneurial Intention

*“Intentions are the single best predictor of any planned behavior, including entrepreneurship”<sup>3</sup>*

In its simplest form, intentions predict behavior. Studying intentions is therefore of interest in order to understand the entrepreneurial act itself (Ajzen, 2002). As such, intentions serve as an intermediary variable between exogenous influences, e.g. formal knowledge, and behavior. Its mediating position has made entrepreneurial intention a major focus area within entrepreneurship literature (Honig, 2004).

The construct of intention was structurally modeled by psychology professor Icek Ajzen (1988). The main emphasis of the psychological theory of planned behavior (TPB) (Ajzen, 1991) is that planned behavior is intentional and thus can be predicted by the intention towards that behavior. So by increasing the entrepreneurial intention within a group, one will see increased entrepreneurial behavior within the same group (Chen et al., 1998). According to the theory, human behavior is an indirect product of three dominant forces: attitude toward the behavior, subjective norm and perceived behavioral control. Grouped together, these forces lead to behavioral intention. When an opportunity arises, people are expected to carry out their intentions, turning them into actual behavior. As illustrated by the dashed line in Figure 1, perceived behavioral control also has a direct influence on behavior, but to a lower extent compared to its influence on intention.

**Figure 1 – Ajzen’s Theory of Planned Behavior**



<sup>3</sup> Krueger, Reilly, & Carsrud, 2000, p. 412

Attitude toward a behavior is a construct describing how a person evaluates a given behavior. This evaluation may be either favorable or unfavorable, based upon earlier experiences and knowledge. Entrepreneurship education may act as an antecedent for all three considerations, but the construct of attitude is particularly affected by skills and training (Shapero & Sokol, 1982). Thus it could be argued that knowledge and ability indirectly influence entrepreneurial intention.

In a recent study (Souitaris, Zerbinati, & Al-Laham, 2007b), the effect of entrepreneurship programs on entrepreneurial intention was tested on engineering students. The results confirmed their hypothesis of an increased intention post-program compared to pre-program. However, the study did not focus on which part of the program contributed to this increase, which may be of interest for the institutions responsible for organizing such courses.

### **Business Plan Based Education**

The historical backdrop of business plans is rooted in the long-term planning carried out to turn around large firms (Fayol, 1988). The management guru of the 20th century, Peter Drucker (1959), defined the process of long range planning as entrepreneurial decision making in essence. His business plan framework was further backed by a number of research papers in the two following decades (Webster & Ellis, 1976; Shuman, College, Shaw, & Sussman, 1985; Hisrich & Peters, 1989). These papers proposed a set of important topics of what the authors of a business plan should emphasize on, such as operational activity, forecasting demand and building strategy. In their 10-year literature review on the subject of entrepreneurship education, Gorman et al. (1997) categorized several of the leading papers. The preliminary review identified 29 articles and organized the discussion according to four categories of content: propensity, pre-startup, post-startup, and educational process and structure. Amongst these articles, it is in the pre-startup category we find the four papers concerned with the framework and methodology of entrepreneurial education. A paper by Knight (1991) is the only one primarily addressing the curricula content. The article proposes a framework for teaching entrepreneurship that includes the following elements: opportunity identification, strategy development, resource acquisition and implementation. By teaching these elements, the student would gain a formal knowledge of the main topics within a business plan. In addition, Knight (1991) further suggests the inclusion of exposure to startup strategies, i.e. specialization instead of generalization (Romanelli, 2012).

The practical limitation which resides in the ability to manage, implement and observe the impact of changes in entrepreneurial environments, sets a high barrier for making an alternative entrepreneurship curriculum, so much of what is known regarding planning and performance comes from strategic planning literature (Meyer, Rowan, American, & Sep, 2007). Advocates of formal planning emphasize the importance of the planning *process* as an important learning experience, but in an evaluation setting the *content* seems to be the dominant aspect of a

business plan (Weir, Kochhar, Lebeau, & Edgeley, 2001). By content we refer to the detailed choices, plans and actions of a strategy, while process refers to the analysis of strategy and organizational development.

There are two dominant views on strategic long-range planning: a synoptic view and an incremental process perspective (Fredrickson, 1984). The synoptic camp highlights the advantages of concrete goals and monitoring. From their perspective, having a business plan is critical in maintaining a line forward in an uncertain environment. But how to handle uncertainty is also the main divider between the two perspectives, as advocates of evaluation with incremental processes stress that business plans may constrain a business in an uncertain environment, instead of enabling it (Fredrickson, 1984). This empirically supported perspective has important implications for educators interested in start-up planning, as many new ventures enter a dynamic market with a radically changed product.

Knight's (1987) business plan framework contributed amongst others (Rich & Gumpert, 1985; Shuman et al., 1985) to make the school of strategic planning the leading school of thought within entrepreneurial education. One thing common to these articles is a proposed structure of the business plan covering 13 to 200 essential points, which also should serve as a basis for entrepreneurial education. Its standardized format and wide diffusion soon made the business plan suitable for international competition between universities.

Business plan competitions offer a context where the participants take part in a learning-by-doing process (Oakes, Townley, & Cooper, 2012), a key aspect in the entrepreneurial mindset (Higdon, 2005). VC is a Scandinavian business plan competition started in 1998 by McKinsey. It has been under the responsibility of Start Norway and its 18 local affiliations since 2004, with VC Mid-Norway being the largest region (NEC & Start Norway, 2012). What differs VC Mid-Norway from the rest of the regional competitions in Norway, is its anchoring within the faculty staff of NTNU. NTNU Entrepreneurship Center (NEC) has contributed to turning it into a 7.5 credit course with six lectures covering the main topics in the business plan: (1) business idea and business plan, (2) market survey and customer needs, (3) organization, (4) strategy, (5) IPR, and (6) realizing and financing the venture.

The participants are evaluated based upon both an oral presentation and the content of the business plan, with emphasis on the latter. This results in a process where students produce business plans from start to finish in a linear approach, and are graded based on their result.

Given both the extent and diffusion of the business plan as a basis in entrepreneurial education, there are surprisingly few studies evaluating its effects on post-course entrepreneurial activity (Gorman et al., 1997). Some would argue that the causal method of planning and prediction acts as a constraint on the business potential in a dynamic environment (Sarasvathy,

2001). In contrast, the method of effectuation is more aligned with actual entrepreneurial dealings with uncertainty. In many ways, effectuation has the same characteristics as the incremental process perspective. What sets them apart, is scope they are addressing, as the former deals with a broader scope, addressing every aspect of an entrepreneurial mindset, while the latter is more focused on the planning in it self. Effectuation processes take some resources for granted and focus on possible effects of these resources. In retrospect, many of the critics of contemporary business plan based education the last 20 years reside within the effectuation camp, and the discussion is mainly divided between these two perspectives.

As business plan competitions serve an important purpose in entrepreneurial education, the pedagogical framework needs to be thoroughly analyzed. Some would argue that business planning education is rooted in rituals rather than efficiency (Meyer et al., 2007). Mintzberg (1994) claimed that such planning could result in a limitation of the range of activities and creative responses to environmental changes. As an alternative approach to close-ended educational programs, he draws on the concept of equilibration introduced by Piaget (1951). As a developmental psychologist, Piaget claimed that logic is incrementally learned, resulting in adult cognition. According to him, we respond to the world by the analytical tools we already have developed (assimilation), but when experiencing something unique it will change the cognitive structure (accommodation) and we have incrementally learned something new. The balance between assimilation and accommodation is termed equilibration, and it is this force that pushes us to constantly learn something new. Thus, while an economy student may be bored by a lecture about mathematical operators, a lesson about shipping investments may provide a progressive challenge leading to intellectual development.

According to Mintzberg, Piaget's theory of learning is particularly well suited to entrepreneurial education, which requires interdisciplinary learning through collaboration, resulting in a mixture of different knowledge systems (Honig, 2004). This forces the students to accommodate new perspectives every time they meet a new challenge. The more able would-be entrepreneurs are to handle unforeseen obstacles, the better they will handle real entrepreneurial challenges in the future. As entrepreneurs must master both the science of the invention and the market constraints, success is not determined by pre-planned activities, but through the observation, interpretation and reevaluation of activities. Rather than following a structured model of planned behavior, entrepreneurial activities are better described as "having an experimental focus that utilizes environmental feedback" (Sarasvathy, 2001, p. 52).

Following Mintzberg's line of thought, Benson Honig, a professor in Entrepreneurial Leadership, proposed a new perspective on the use of business plans in entrepreneurial education (Honig, 2004). If the students were to be prepared for the daily challenges they will meet as entrepreneurs, they would also need to face the same challenges during their education. Defining what these challenges are and how to cope with them can be seen from either an

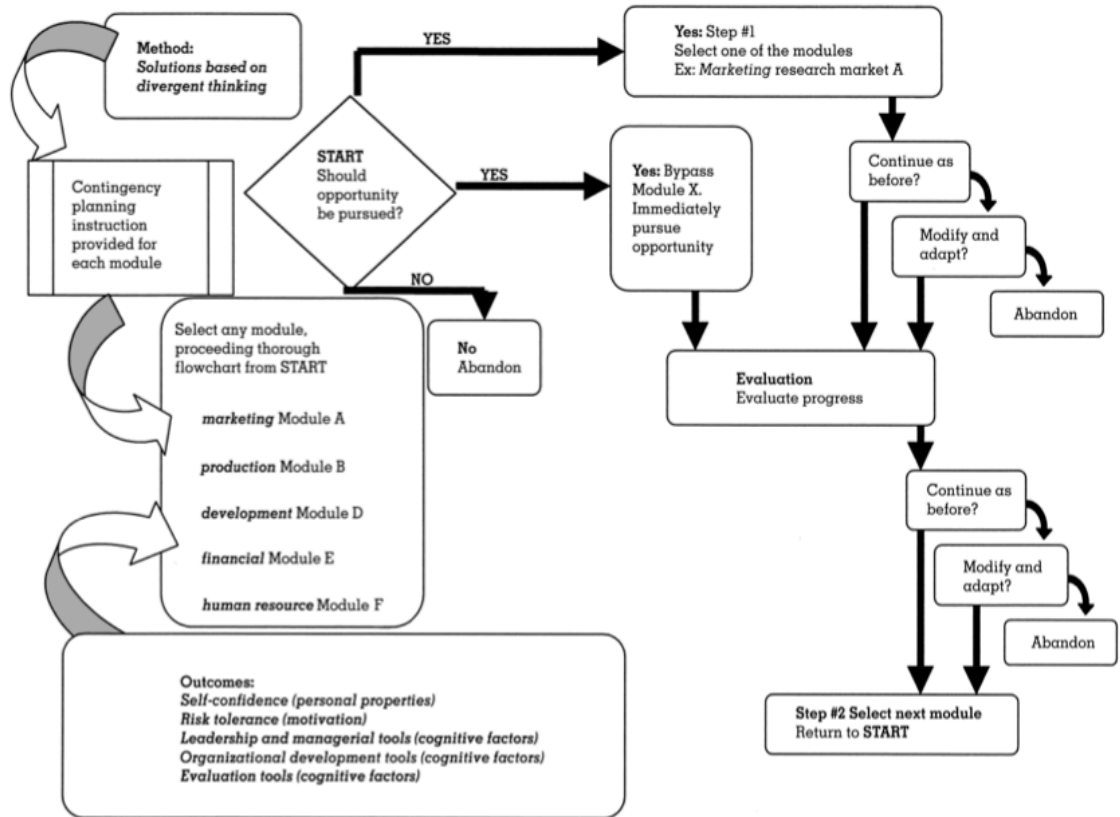
effectuation or a causation point of view (Sarasvathy, 2001). Honig and Mintzberg may best be described by the former category, while Drucker and Knight reside in the latter. Honig argues that starting a new business can be compared to going into battle, whereby the entrepreneur must allocate the right resources and a feasible strategy in order to beat competitors.

Entrepreneurship, like war tactics, will benefit from less focus on the production and evaluation of detailed plans, and more emphasis on developing the necessary skills to re-evaluate and adapt activities according to new environments. Rather than pursuing a causal model of planned behavior, entrepreneurial activities may best be described as having an experimental focus that utilizes environmental feedback (Sarasvathy, 2001).

Robert McNamara (1986), former US defense secretary, observed that pre-planned war procedures were not apt in the real world, and argued that the best way of dealing with uncertainty was rather to react to the situation at hand in a creative manner. Honig draws the link between the field of war tactics and entrepreneurship when it comes to dealing with uncertainty, and therefore makes the argument that entrepreneurship courses should focus on also building the would-be entrepreneur's informal skills. While traditional pedagogy emphasizes formal knowledge and skills, actual entrepreneurial activities require more adaptability in relation to complex and dynamic problems (Wood, 1995).

In order to address the shortcomings of the causal model used in entrepreneurship education today, Honig (2004) propose a new approach, building on top of the theoretical work of Piaget (1951). As entrepreneurial activities rarely consist of right or wrong answers, it would be better to equip students with the skill to navigate within paths characterized by uncertainty and unpredictability (Shane & Venkataraman, 2000). Thompson (1967) describes entrepreneurial activities as features of open systems, pointing to the existence of more variables than can be predicted, understood and controlled. Thus, entrepreneurial education should focus on an open-ended dialectic approach, better aimed at developing tacit knowledge and the ability to adapt to changes, rather than the ability to preconceive changes. Learning how to make a business plan is something students should not be without, but there is no requirement that this should be done in a linear manner. What is required is the development of skills to manage knowledge in a dynamic manner, as Piaget proposed in his learning theory. Honig therefore propose an alternative learning, the contingency model, as shown below in Figure 2.

**Figure 2 - Honig's Contingency Model**



The contingency model enables development of capabilities to manage knowledge assets in a dynamic manner. Rather than generating a business plan from start to finish, this model splits the different topics into different independent learning modules. Each module consists of specific entrepreneurial activities relevant to the challenge at hand.

The model proposed is designed as an open system letting the student start from any point in the entrepreneurial cycle, instead of a pre structured arrangement (Honig, 2004). The students simply choose the module they view as important, and proceed through with the connected program activities. The role of the teaching staff is to assist the students by counseling them during their activity in order to integrate the activity into their cognitive map.

This iterative and dynamic process makes extensive use of Piaget's (1951) theory of equilibrium. By incrementally assimilating new knowledge and using it in interaction with the environment, students will continuously replace their current cognitive map with a new one, resulting in a cognitive development. So following each iteration, the students will be in a state of disequilibrium, having learned new perspectives and acquired new knowledge. They will move out of this position by accommodating their newly learned knowledge solving real life challenges.

Better configured to incorporate effectuation, the contingency model lets the student choose the learning module of interest, such as market analysis, marketing, production and development, financial planning and human resource strategy. The proposed modules in Honig's (2004) contingency model are based upon the chapters usually generated when developing a business plan. Each module is independent of the others, and may be chosen arbitrarily. Put in other words, it follows that each learning module is to be considered equal in its learning value for the would-be entrepreneur. But according to Fiet (2000), there is a wide divergence in topics and theories taught at different institutions, and some of these are regarded as more relevant for would-be entrepreneurs than others. The underlying cause for the wide divergence seems to be a characteristic of a developing academic discipline, with different ways of teaching entrepreneurship lacking a theoretical rigor. Based on the analysis of the syllabi from 18 different institutions, Fiet made the following breakdown of the different topics taught: strategy analysis, managing growth, idea generation, risk and rationality, financing and creativity.

In lack of a general entrepreneurship theory, entrepreneurial education may best be described as a patchwork of theories from other disciplines, where some theories may prove better than others in order to prepare the students for challenges ahead. Thus, it is of interest to find out which topics contribute the most to increase entrepreneurial intention and actual involvement, and this paper will focus on the following research question: "Which field of knowledge acquired when participating in a business plan competition contributes most to increased intention and entrepreneurial involvement?" Based upon the assumption that a difference exists, we propose the following hypothesis:

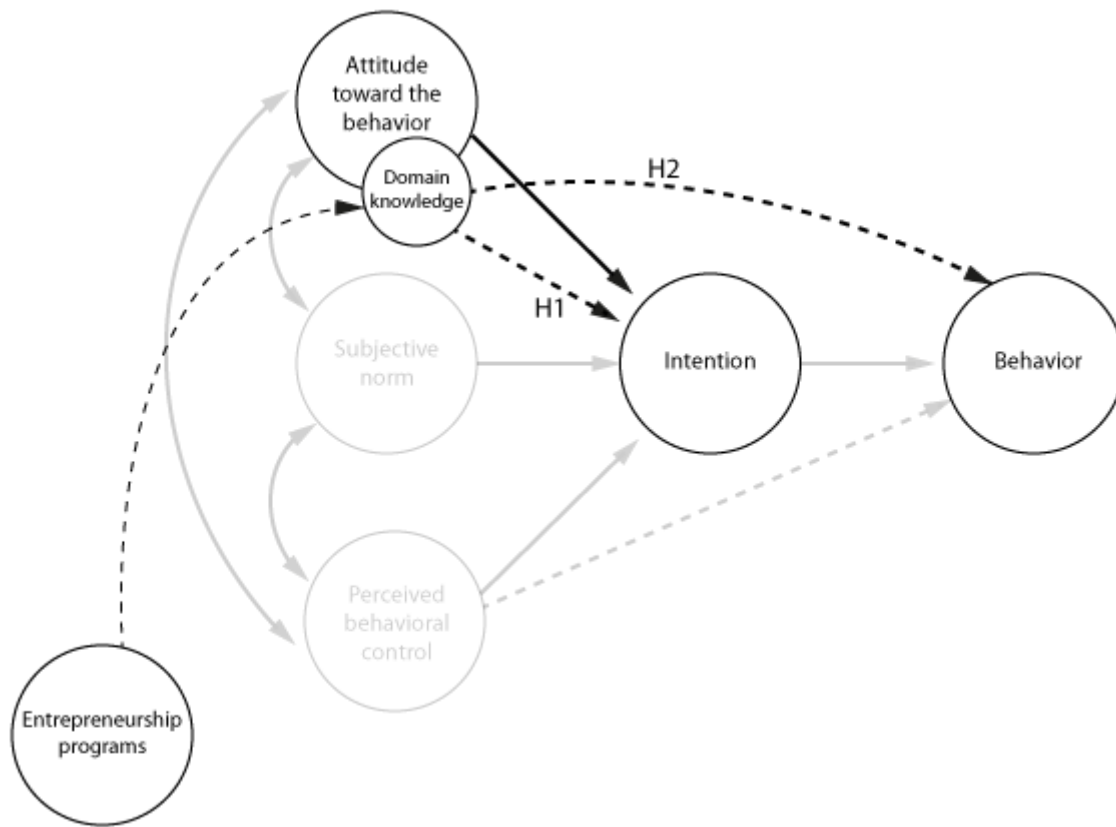
Hypothesis 1 (H1): There is a difference in the extent to which the various fields of knowledge, obtained during a business plan competition, affect entrepreneurial intentions.

Should Hypothesis 1 be empirically supported, it would also be of interest to see if there exists any direct relationship between domain knowledge and behavior. In that case, the construct of domain knowledge would act as the construct perceived behavioral control, having dual influence on both intention and behavior. We therefore propose the following hypothesis:

Hypothesis 2 (H2): There is a difference in the extent to which the various fields of knowledge, obtained during a business plan competition, affect actual entrepreneurial involvement.

The hypotheses are included in the TPB model in Figure 3. Existing constructs not affected by our proposed hypotheses are faded out.

**Figure 3 - TPB with Hypotheses**



### Summation

The current pedagogical framework is designed to result in a standardized formatted business plan with multiple chapters in a formal structure. Such closed-ended pedagogical activities are not, according to Honig (2004), closely attuned to actual entrepreneurial activities. He therefore proposes a contingency model as an alternative pedagogical approach to the close-ended business plan education. This approach assumes that all learning modules provide equal learning effect, an assumption that stands in contradiction to Fiet (2000) study. By using the TPB as a framework, it is possible to verify a relationship between the domain knowledge obtained during a program and the student's increased entrepreneurial intention and involvement.



### **3. Methodology**

The research design utilized in this study is an explanatory, cross-sectional and quantitative one, consisting of an online questionnaire with 24 questions. This research method was chosen mainly because it can provide answers to our research question in a time-efficient manner, as a result of the limited time at our disposal. By gathering large amounts of empirical data on former participants, we were able to gain knowledge and identifying patterns that would have been difficult relying only on a case study (Yin, 2009b). As this study was performed with help and support from NEC, we were given access to contact information of former participants, which made the survey method a viable approach. Using the survey method is also regarded advantageous when describing the prevalence of a phenomenon (Yin, 2009b), such as the correlation between entrepreneurial intention and the participation in business plan competitions.

#### **Research Setting**

This study has been planned and executed in the same premises as NEC is situated, 4th floor of the central building at NTNU campus Gløshaugen. Drawing upon the experience of acclaimed researchers such as Sigmund Waagø and Lillian Waagø has been invaluable, and has helped us during the planning and execution of the survey. The potential drawback of this setting is the fact that NEC plays an important part in the organization of VC Trondheim, and could therefore be biased towards favorable research results. It should be noted that NEC has a very scientific environment, were differences in perceptions would more likely cause curiosity than disapproval. In any case, we have mitigated this potential bias by performing the data pattern identification and analysis independently of the NEC team. With the exception of technical challenges in SPSS, the authors have worked independently of NEC.

#### **Data Sampling**

There are two main survey-sampling methods, the probability method and the non-probability method. In the former, anyone in the population has a probability of being selected; while in the latter, members of the population are chosen in a nonrandom manner. In our survey we have relied on a judgment sampling method, which is a form of nonprobability sampling. This method lets us as researchers select the sample we want based on a given judgment or rule. The criteria used were that everyone in the population had been a former participant in VC Mid-Norway between 2003 and 2011 and had an engineering or medicine background.

We were given a name list of all former participants, and performed online searches to obtain the email addresses of those lacking this information. In total, we ended up with contact info of 240 former participants, out of a total of 304. The questionnaire was sent out on

February 10, 2012, and was taken offline after 32 days. During this period of time, two follow-up reminders were sent out. We received a total of 113 answers, yielding a response rate of 47.1%.

In addition, this paper utilizes parts of a control group as well. The same survey was sent out to a control group to be able to compare these two groups of individuals against each other in a different paper. This group was sampled by a combination of convenience and judgment sampling, by the use of the NTNU Alumni office newsletter. The link to the survey was included in the monthly routine news mail. A drawback with this proxy approach was that it made it impossible to follow-up with reminder emails to the recipients. The email was distributed to 6720 members of NTNU alumni, all with former ties to either engineering or medicine. Out of this group, we got a response rate of 10.7%, or 721 respondents. As it turned out that 28 of these had previously participated in VC, their answers were included in this study as well, making it a total of 132 former participants.

The respondents who lacked a 5-year engineering background were later removed from the population due to the following reasons. Firstly, the behavior of engineering students is inherently interesting, as their technical training provides them with skills to start high-growth technical ventures. Secondly, by having a more homogeneous sample there may be less variation within the group, increasing the representability. However, since the questions used in this study are not specifically linked to engineering students, the results may also be applicable to other student groups, e.g. medicine, economists or design.

### **Literature Sampling**

In order to gain an insight into previous literature dealing with entrepreneurial education, we made contact with highly regarded researchers within the field. Vegar Johansen, Lars Kolvereid and Sigmund Waagø all helped us out by pointing to relevant literature. Our goal was to achieve an overview of previous research on the effects of business plan competition as an educational method.

After reading the articles referred to, a snowball sampling approach was used. Many of the articles cited the same studies<sup>4</sup>, thereby making them of interest to this study. These articles provided us with a better understanding of elementary principles in the domain.

In addition to the snowball approach, we used the keywords mentioned within abstracts in frequently cited studies as search terms in Google Scholar. The search result was ranked according to its number of citations. We also made a subjective evaluation of the quality of each

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<sup>4</sup> Ajzen (1991), Piaget (1960) and Sarasvathy (2001)

study, taking its publication year, the status of the researcher and the craftsmanship of the paper into account.

## **Data Sources**

Our questionnaire consisted of 24 questions. The majority of the questions were either based on a 5-point Likert scale, or on a multiple-choice form with only a single answers being possible.

Questions were grouped together according to their type, and they were carefully ordered by the following structure: (1) background info, i.e. age, gender and field of study; (2) VC-specific questions, i.e. motivation for participation and learning effect; (3) working environment, i.e. size and location of company; (4) entrepreneurial intention, i.e. propensity for entrepreneurship; (5) technical, i.e. participation in raffle.

The survey was sent out to the respondents through email. The email included an introduction to the survey and its purpose, how the recipients had been chosen, an estimate of the time needed to complete it, a link to the survey, and who were behind the study and our contact information (presented in appendix A).

## **Data Analysis**

In order to analyze the data set, we have used IBM SPSS Statistics 18. SPSS is a software used for survey authoring and statistical analysis in business and science.

One of the most used methods in this study is the Pearson product-moment correlation coefficient. It measures the correlation between two variables X and Y, setting a value between -1 and 1.

Developed by mathematician Karl Pearson in 1880, it still serves as a subject for debate regarding how to interpret its values (Rodgers & Nicewander, 2008). The interpretation of a correlation coefficient depends very much on the context in question. In our study we have based our interpretation of the effect size and significance value on Cohen's guidelines for social sciences (Cohen, 1992). These guidelines states that testing several null hypotheses requires a significance value of 0.01 or lower, while the Pearson correlation coefficient has a low effect size with a value above 0.1, medium above 0.3 and large if higher than 0.5. It should be noted that this interpretation is not exact science, due to contextual differences.

The independent-sample t-test compares the mean scores on a given variable. It assumes that the two groups have approximately equal variance on the dependent variable. This is taken account for by using the Levene's test.

## **Data Validity**

By validity we are referring to the extent to which our empirical study adequately reflects the reality of the concepts under consideration. Put in other words, validity means that we are actually measuring what we are supposed to be measuring.

In this survey, the sampling group consists of a relatively homogenous group of students, improving the statistical conclusion validity. In addition, the large sample size (N=132) further attributes to this validity.

Internal validity looks at the causality between two variables, and is concerned with the data analysis part. As this study is an explanatory one, the data analysis has controlled for third factors when investigating causal relationships, to insure that the relationships are not spurious. This study has used explanation building by using literature and the authors' own reflections in order to explain the various outcomes.

Construct validity is based on the logical relationships among the variables used in this study. As we set out to measure entrepreneurial intention and actual involvement, we used the quantitative research methods used by a leading social scientist in the domain (Johansen, 2011) as a basis. In practical terms, this translates into adopting the Likert scale, implementing control variables such as self-employed parents and differentiating entrepreneurial involvement on the basis of years in operation.

## **Criticism of Methodology**

The influence of common method variance is a usual source of concern for organizational and psychological studies (Meade, Watson, & Kroustalis, 2007). Addressing the spurious variance caused by the measurement method rather than the actual constructs, it is often a source for introducing bias in findings, namely common methods bias. In our study, the cause of concern that needs to be addressed is any artifactual covariance between the predictor and criterion variable. As there is no control group in this study, the method variance can either inflate or deflate the relationship between constructs, thus leading to both Type I and Type II errors.

One of the most widely used techniques used to address the issue of common variance is what is known as Harman's one factor test (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). The basic assumption of this test is that if a substantial amount of common method variance is present, a single factor will emerge from the analysis. The results after running a factor analysis in SPSS can be seen in Table 1.

**Table 1 - Harman's One Factor Test**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.455	44.546	44.546	4.455	44.546	44.546
2	1.302	13.020	57.566			
3	1.064	10.642	68.208			
4	.663	6.630	74.837			
5	.618	6.176	81.014			
6	.585	5.848	86.861			
7	.424	4.239	91.100			
8	.347	3.466	94.566			
9	.280	2.804	97.370			
10	.263	2.630	100.000			

Extraction Method: Principal Component Analysis.

The 10 variables used in this survey were used in a factor analysis without rotation. We observe that the first factor is below 50%, indicating that no factor explains a majority of the variables. It should still be noted that 44% is still a lot of variance to explain, and should be kept in mind when evaluating the findings.

The questions used to measure the learning effect (Q11a-h) were formulated and defined based on the curriculum description paper for VC. As this was only a tentative plan for the course, the actual lectures may have excluded some of proposed fields of knowledge. In addition, the students may have learned a lot more than what is defined within our learning modules, which may be of importance. In future studies, this could be addressed by asking questions within general terms, e.g. funding, and then include more specific settings within each term, e.g. venture capital, thereby gaining a broader and more detailed understanding of what they have learned.

For some respondents the questions may have been difficult to answer correctly, due to its referrals to events that possibly happened years ago. It might be that the respondents overestimated the actual learning effect following participation in VC, and thereby introduced bias. In order to mitigate this memory bias, a control variable accounting for year of participation could have been included. Such an approach should be included in future studies.

## **Findings**

In this part, the results of our main findings will be presented in light of our research question, followed by a discussion.

The two hypotheses used in this study are followed by two corresponding null hypotheses. For the first hypothesis, the null hypothesis is: "There is no difference in the extent

to which the various fields of knowledge, obtained during a business plan competition, affect entrepreneurial intentions.” Our data can only reject or fail to reject the null hypothesis, based upon the significance and the effect size of the analysis. The corresponding null hypothesis to the second hypothesis is: “There is no difference in the extent to which the various fields of knowledge, obtained during a business plan competition, affect actual entrepreneurial involvement.”

### **Entrepreneurial Intention**

As proposed in our hypothesis, we assume that there is a difference in the knowledge obtained during a business plan competition, meaning that some learning modules lead to more entrepreneurial intention than others. In order to test our hypothesis, we asked the former VC-participants “To what extent do you agree that the following were some of the effect of participating in Venture Cup: I wanted to start a venture.” The respondents graded their answers from 1 (*very little extent*) to 5 (*very high extent*). When testing our hypothesis, we employed a bivariate correlation test and an independent t-test.

A bivariate correlation test was conducted on the answers given to the former question and the following: “To what extent did you learn about the following by taking part in Venture Cup?” Based on the following learning modules, they graded their perceived learning effect from 1 (*very little extent*) to 5 (*very high extent*). This resulted in the correlation matrix depicted in Table 2.

**Table 2 - Intention Correlation**

Learning Modules:		"I want to start my own business"
Turning Idea Into Plan	Pearson Correlation	.272
	Sig. (2-tailed)	.002
	N	125
Customer Identification	Pearson Correlation	.304
	Sig. (2-tailed)	.001
	N	125
Business Plan Structure	Pearson Correlation	.199
	Sig. (2-tailed)	.026
	N	125
Finance and Profit	Pearson Correlation	.205
	Sig. (2-tailed)	.022
	N	125
Organization and Management	Pearson Correlation	.026
	Sig. (2-tailed)	.775
	N	125
Partner Agreements	Pearson Correlation	.077
	Sig. (2-tailed)	.394
	N	125
Investment Presentation	Pearson Correlation	.266
	Sig. (2-tailed)	.003
	N	125
Funding	Pearson Correlation	.185
	Sig. (2-tailed)	.039
	N	125

The correlation is, as stated in the methodology chapter, regarded as significant at levels below 0.01. Put in other words, there is only one chance in a hundred that this result is coincidental. From the matrix we observe three learning modules that satisfy this requirement, namely “Turning Idea into Plan”, “Customer Identification” and “Investment Presentation”. All of these vary widely in regard to their correlation strength, with “Customer Identification” being the module with the highest correlation value ( $r = 0.304$ ). According to Cohen, this translates into a medium size correlation effect. Thus, the null hypothesis can be rejected, which assumes no relation between the two phenomena.

We also observe that a less strict significance requirement,  $p = 0.05$ , would have yielded 6 out of 7 learning modules significantly correlating with an increased intention, further strengthening the proposed relationship.

The answers from Q13:6 were then recoded into a binary variable, transforming the values of 1 - 3 into 0 and the values of 4 - 5 into 1. This enabled a comparison of the means between the group who was inclined to start a venture right after VC, and the group that was less inclined to do so. The groups were then tested against the extent of learning they felt they had obtained during participation in VC. As the learning modules were based on a 5-point Likert scale, we could compare their mean values in a independent t-test.

**Table 3 - Intention Group Statistics**

Want to start a venture		N	Mean	Std. Deviation	Std. Error Mean
Turning Idea Into Plan	No	38	3.63	1.025	.166
	Yes	87	4.00	.807	.087
Customer Identification	No	38	2.82	1.111	.180
	Yes	87	3.30	1.036	.111
Business Plan Structure	No	38	3.34	.938	.152
	Yes	87	3.63	.823	.088
Finance and Profit	No	38	2.82	.896	.145
	Yes	87	3.16	1.033	.111
Organization and Management	No	38	2.74	1.083	.176
	Yes	87	2.77	.985	.106
Partner Agreements	No	38	2.24	.998	.162
	Yes	87	2.37	1.001	.107
Investment Presentation	No	38	2.71	1.250	.203
	Yes	87	3.17	1.102	.118
Funding	No	38	2.82	.982	.159
	Yes	87	3.18	1.029	.110



**Table 4 - Intention T-test**

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Turning Idea Into Plan	Equal variances assumed	5.201	.024	-2.158	123	.033	-.368	.171
	Equal variances not assumed			-1.966	57.935	.054	-.368	.187
Customer Identification	Equal variances assumed	.267	.606	-2.346	123	.021	-.483	.206
	Equal variances not assumed			-2.281	66.278	.026	-.483	.212
Business Plan Structure	Equal variances assumed	.300	.585	-1.736	123	.085	-.290	.167
	Equal variances not assumed			-1.649	62.993	.104	-.290	.176
Finance and Profit	Equal variances assumed	1.455	.230	-1.786	123	.077	-.345	.193
	Equal variances not assumed			-1.889	80.709	.063	-.345	.183
Organization and Management	Equal variances assumed	.510	.476	-.169	123	.866	-.033	.197
	Equal variances not assumed			-.162	64.927	.872	-.033	.205
Partner Agreements	Equal variances assumed	.120	.729	-.673	123	.502	-.131	.195
	Equal variances not assumed			-.674	70.788	.502	-.131	.194
Investment Presentation	Equal variances assumed	1.425	.235	-2.068	123	.041	-.462	.223
	Equal variances not assumed			-1.968	63.241	.053	-.462	.235
Funding	Equal variances assumed	.405	.526	-1.865	123	.065	-.368	.197
	Equal variances not assumed			-1.899	73.676	.061	-.368	.194

The Levene's test for equality of variances tells us that two variances are significantly different if the p-value is below 0.05, which is the case for the first learning module. This means that the learning module "Turning idea into Plan" has a significant variance in the answers given by both groups, and the numbers found in the lower row should thus be used. The same case can not be made for rest of the learning modules, given their p-values are above 0.05. As the Levene's test is not significant, we have met the assumption needed for the independent t-test.

From the independent-sample t-test, we observe the same pattern as we did in the bivariate correlation test. Both the learning modules "Customer Identification" ( $p = .021$ ) and "Investment Presentation" ( $p = .041$ ) have a significant difference of means yielding  $-.483$  and  $-.462$  respectively.

### Entrepreneurial Involvement

As intention affects the potential behavior (Ajzen, 1991), it would also be of interest to see if there exist a linkage between the perceived learning effect of the different modules and actual entrepreneurial involvement. In order to verify the second hypothesis, we recoded the answers from Q18 (Appendix A) "Have you, individually or collectively, tried to start a venture?" into a binary variable. The old values of 1 and 2, which both indicated that the individual had not

started a venture, were set to 0, while the positive alternatives of 3 - 6 were set to 1. Hence, the new variable was used as a grouping variable in the independent t-test.

**Table 5 - Involvement Group Statistics**

Involved in startup		N	Mean	Std. Deviation	Std. Error Mean
Turning Idea Into Plan	No	52	4.08	.837	.116
	Yes	72	3.74	.904	.107
Customer Identification	No	52	3.17	.985	.137
	Yes	72	3.11	1.133	.134
Business Plan Structure	No	52	3.63	.841	.117
	Yes	72	3.46	.871	.103
Finance and Profit	No	52	3.10	1.034	.143
	Yes	72	3.00	.964	.114
Organization and Management	No	52	2.87	.950	.132
	Yes	72	2.65	1.023	.121
Partner Agreements	No	52	2.38	.953	.132
	Yes	72	2.25	.989	.117
Investment Presentation	No	52	2.77	1.096	.152
	Yes	72	3.19	1.171	.138
Funding	No	52	3.04	.969	.134
	Yes	72	3.07	1.053	.124

**Table 6 - Involvement T-test**

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Turning Idea Into Plan	Equal variances assumed	.987	.322	2.137	122	.035	.341	.159
	Equal variances not assumed			2.164	114.680	.033	.341	.157
Customer Identification	Equal variances assumed	2.143	.146	.317	122	.752	.062	.195
	Equal variances not assumed			.324	117.793	.746	.062	.191
Business Plan Structure	Equal variances assumed	.054	.817	1.128	122	.261	.176	.156
	Equal variances not assumed			1.135	112.257	.259	.176	.155
Finance and Profit	Equal variances assumed	.493	.484	.532	122	.596	.096	.181
	Equal variances not assumed			.526	105.332	.600	.096	.183
Organization and Management	Equal variances assumed	1.597	.209	1.176	122	.242	.213	.181
	Equal variances not assumed			1.190	114.493	.236	.213	.179
Partner Agreements	Equal variances assumed	.199	.657	.759	122	.449	.135	.177
	Equal variances not assumed			.764	112.393	.447	.135	.176
Investment Presentation	Equal variances assumed	.451	.503	-2.050	122	.043	-.425	.207
	Equal variances not assumed			-2.072	114.058	.041	-.425	.205
Funding	Equal variances assumed	.021	.884	-.167	122	.868	-.031	.185
	Equal variances not assumed			-.169	114.957	.866	-.031	.183

Enforcing a significance value of  $p = 0.01$  results in no significant results. Thus, the second null hypothesis cannot be rejected, due to lack of sufficient data. This means that there are no measured correlation between obtained domain knowledge and post-course entrepreneurial involvement. The second hypothesis is therefore yet to be verified.



## 4. Discussion

We had posed the research question: “Which field of knowledge acquired when participating in a business plan competition contributes most to increased intention and entrepreneurial involvement?” To address this question, we developed two hypotheses grounded in Fiet's (2000) observations and the TPB (Ajzen, 1991). As the results show, the *null hypothesis 1* is rejected, thereby verifying our hypothesized relationship between learning obtained during VC and entrepreneurial intention. An increased knowledge about how to identify possible customers leads to higher entrepreneurial intention, as the correlation matrix shows. In addition, knowing how to present the business case for potential investors and structuring a business idea into a plan also plays an important role in the increase.

A possible interpretation of the increase in intention is the following: All three modules with a proven intentional effect have one common characteristic, they all require a change in perspective and mindset, as opposed to the other more traditional business learning modules. By understanding how to identify a customer, one would have to think like a customer. In order to sell the business case to potential investors, one would have to think like an investor, seeing the business case from their point of view. And finally, in order to structure a business idea into a plan, one would have to think like an entrepreneur. In line with Piaget's (1951) thoughts, these learning modules challenge the cognitive structure by providing the students with a new perspective. These challenges ultimately change the cognitive map of the student, leading to new knowledge.

As the relationship between the learning obtained during VC and actual entrepreneurial involvement proved insignificant, we lack the data to reject the second *null hypothesis*. Hence, the second hypothesis is not verified. The lack of students actually changing their behavior due to their increased intention could be caused by the effect of an enthusiasm generated by their business plan project, which may have dissolved soon after the program was finished. We tried to mitigate this effect by contacting all former participants, instead of relying on a longitudinal study. It is also possible that the moderate increase in intention caused by increased specific knowledge is not enough to impact the actual behavior. According to the TPB, an increased knowledge will affect an individual's attitude, which in turn affects the intention, which in the final step will have an impact on behavior. This road may be deemed “too long to travel” for any observable correlation to exist. Put in other words, the enthusiasm generated by their business-plan project, contributed only to an increased motivation to start something, not actually doing it. However, a very low proportion of graduates starts a venture immediately after graduation (Lüthje & Franke, 2003), and this should be accounted for. A longitudinal study following the subjects for years after graduation may be the best way to verify a possible domain-knowledge - behavior link.

One could argue that entrepreneurial behavior is more than just former startup experience. By only relying on whether or not they previously have been involved in starting a venture, one will exclude teachers, consultants and researchers involved with entrepreneurship in some way or another (Kolvereid & Moen, 1997). The objective of teaching entrepreneurship is not only to create more startups, but also improving the quality of the ones who try, which in turn requires a sophisticated value chain for ventures to succeed in. Thus, entrepreneurial behavior should be measured by several factors. We addressed this challenge by including Q15 (Appendix A): “To what extent are you involved in innovation in the workplace, such as an advisor or participant in connection with the financing, product development or market development?” In retrospect, we see that this formulation may have been misinterpreted, due to its emphasis on concrete context. The bivariate correlation test showed no significant relationship with the various learning modules.

As our results are based on a sample of respondents chosen by our criteria instead of at random, it's hard to argue that the results are entirely representative for the general population. But as the group can be described as approximately homogeneous, consisting only of engineering students, the results may be applied to engineering students at other schools as well. As the engineering students play a key part in many high-tech ventures, their group characteristics should be of importance.

## 5. Implications and Conclusion

So where do our findings lead the education and entrepreneurship literature? Our hope is that practitioners, such as faculty staff responsible for organizing entrepreneurship courses, will benefit from a more substantial open-ended model for teaching entrepreneurship alongside business plan writing. In addition, we hope to further expand the TPB, by including our findings in the structural model.

### Implications for Further Research

*“Perhaps of greater importance is the possibility of making further distinctions among additional kinds of beliefs and related dispositions.”*

This study has contributed with a more detailed explanation of the relationship between learning effect and increased entrepreneurial intention. This finding act as supplement to Ajzen’s TPB, providing a more substantial picture of the structured behavior model. As Ajzen (1991) pointed out at the end of his article, the TPB is open to the inclusion of additional predictors as long as it can be shown that they capture a significant proportion of the variance in intention. His theory could be described as one of the most influential conceptual framework for the study of human action, and any supplements to it should be based upon unequivocal empirical studies. Therefore, we urge future studies to confirm our finding in a different setting, which in turn would make the relationship more generalizable.

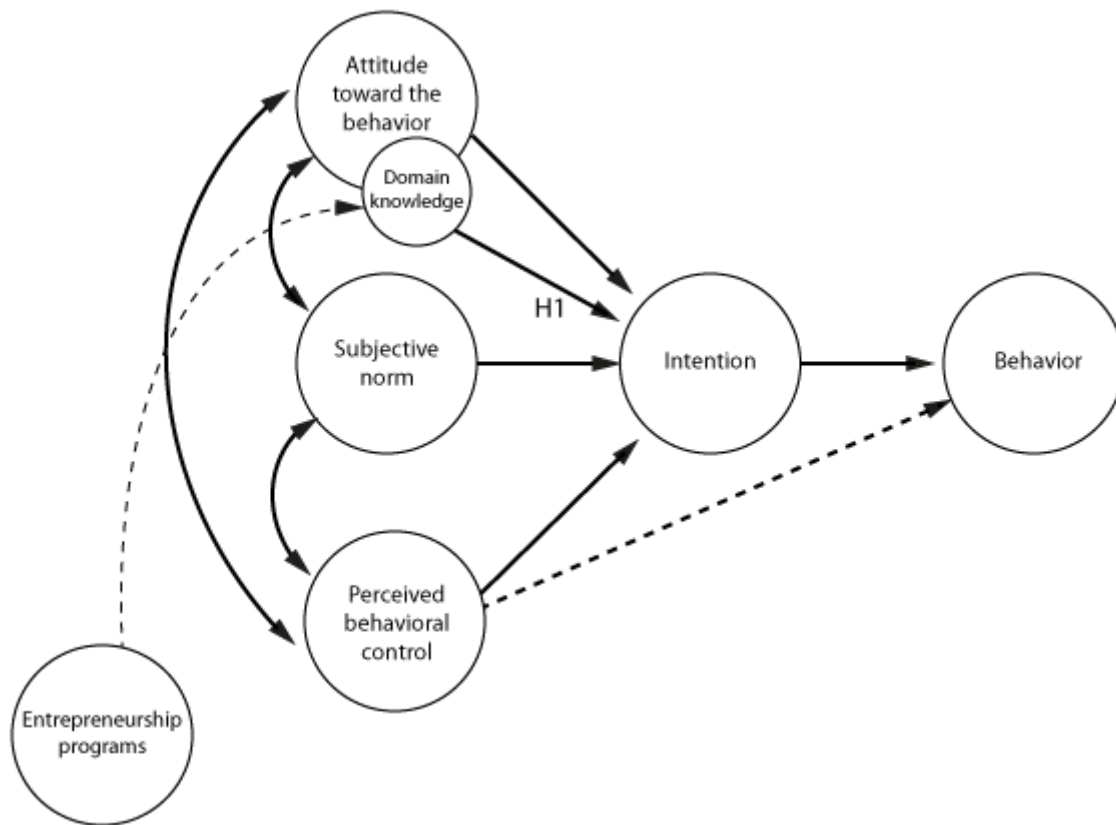
By failing to establish a relationship between the knowledge obtained during the course and entrepreneurial involvement, we encourage future studies to look more deeply into the how the formal knowledge is actually put to use during nascency. A qualitative study could shed light on the inner processes in work, and propose a structural model, followed by a quantitative study supporting or rejecting the proposed model.

Our study also raises a number of questions about the pedagogical aspect of entrepreneurial education. As our findings indicate a relationship between learning new perspectives to evaluate a venture and increased entrepreneurial intention, future explanatory studies may focus on why learning new perspectives leaps the motivation. According to Piaget (1960) and his cognitive theory of development, the accommodation of new knowledge solving real entrepreneurial challenges results in an intellectual development, but it does not address the different effects the various learning modules seem to have.

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<sup>5</sup> Ajzen, I., 1991, p. 199

**Figure 4 - Expanded TPB Model**



### Implications for Practitioners

*"Rather than accepting standardized activities, we should begin examining our learning interventions in order to identify those activities most suitable for future entrepreneurs."<sup>6</sup>*

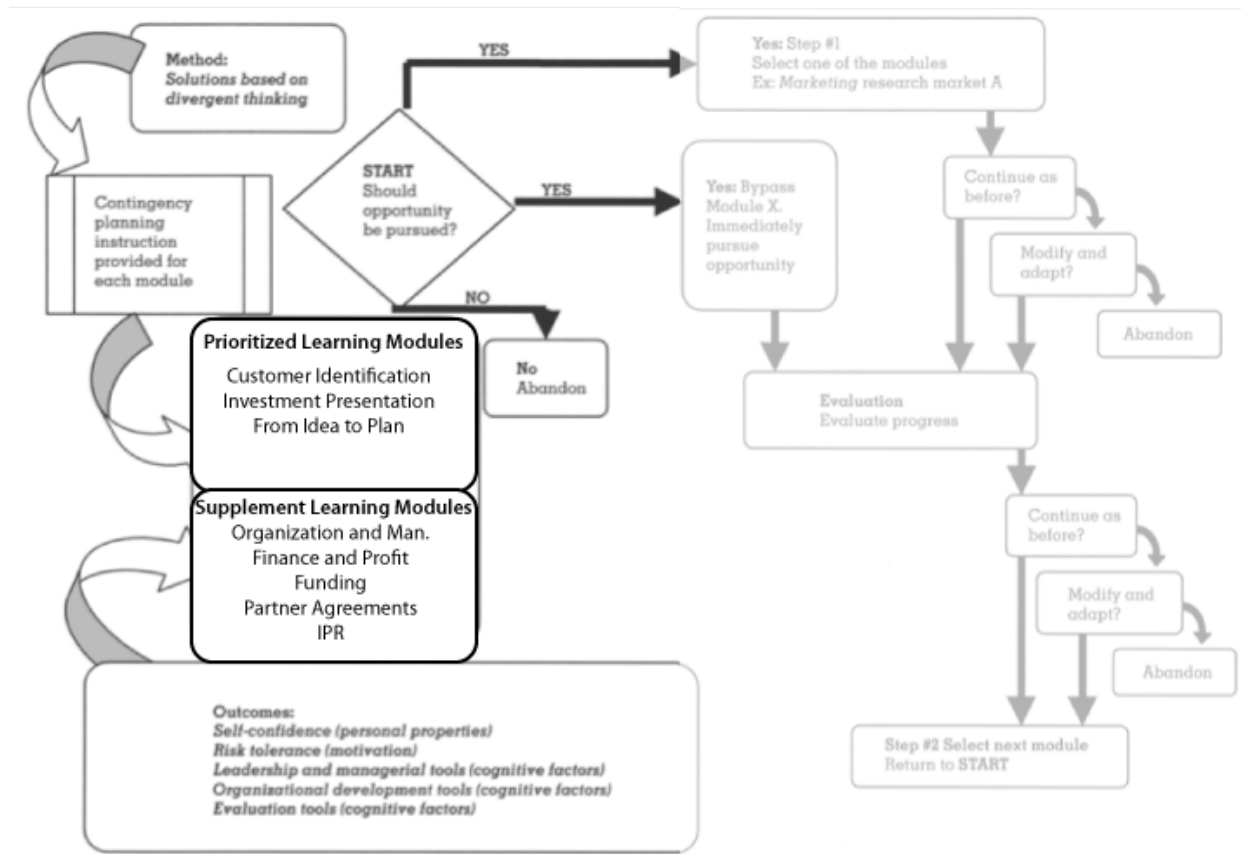
The results of this study may be regarded as useful by higher educational institutions that seek to offer entrepreneurial education. Implementing a more open-ended business plan based-education will give the students the hands-on experience, the formal and the tacit knowledge that a would-be entrepreneur will need in order to overcome entrepreneurial challenges in the future.

We would recommend the responsible faculty staff to take a closer look at Honig's contingency model. Its descriptive and understandable structure makes it ideal to serve as a concrete road map to a more open-ended entrepreneurial education. Following the results from our study, we would propose a new version of the contingency model, which is depicted below in Figure 5.

<sup>6</sup> Honig, 2004, p. 270.



**Figure 5 - Revised Contingency Model**



As noted by Fiet (2010), there is dispersion in curriculum content in current entrepreneurship education. Some of the knowledge fields obtained during a course will have a higher effect on entrepreneurial intention than others. Our findings are used to differ the various modules according to their effect. By separating them into two groups, prioritized and supplementary, we hope to contribute to make the contingency model more viable for faculty staff. As it is probable that more universities and university colleges will adopt the Mid-Norway model (NEC & Start Norway, 2012), offering entrepreneurship courses alongside business plan competitions, they should know which learning modules to emphasize on. As some may lack the resources to offer lectures on every topic, our contribution guides them in where those resources are best spent.

### Limitation of Study

As this study is based on a single-case design, its replicability is substantially lower compared to conclusions independently arising from two cases (Yin, 2009b). Thus, in order to make the findings of this study generalizable, we urge further research on other business plan competitions with the same or similar hypotheses in mind. If the same relationships were found, they would strengthen the external validity and make the results more generalizable to other settings.

Some of the students who voluntarily sign up to participate in VC, will already possess an interest and motivation for entrepreneurship, and will thus not reflect the average student's attitude toward entrepreneurship. As such, it is natural to assume that their entrepreneurial intentions prior to participation are higher than that of their peers, something that introduce self-selection bias. A pre-course test of former participant's intention could have been used as a control variable, but that would have reduced the sample size to an insignificant value, as it in this case would have reduced the population to individuals participating this spring (2012). For future studies on the subject, a pretest should be conducted over a number of years to better address this source of error. In addition, we would advise to include measures of role models, attitudes and norms, since these factors have been found to affect entrepreneurial intention (Kolvereid & Moen, 1997).

Entrepreneurial intention and involvement were measured with single-item measures. As each construct was linked to only a single question, they are vulnerable to misconception. An alternative approach could be to pose several questions within the same domain and triangulate the value based upon an average sum of these answers. Due to this survey's general application area (Paper 1, Paper 2, NEC-Paper), this was not done. For future studies on the subject we would strongly recommend an adaptation of the suggested alternative approach.

This study addressed the relationship between learning effect and intentions and involvement, but not the attitude toward entrepreneurship in general as described. Ajzen (1991) described attitude as a person's favorable or unfavorable evaluation towards performing a specific behavior. A longitudinal design would better address this kind of measurement, as it would reveal the student's attitude towards entrepreneurship pre-course, which could have been used as a control variable.

Last, this study does not explore the whole contingency model, but rather focuses on the learning modules.

## **Conclusion**

This study has showed that specific knowledge obtained during a business plan course is positively related to increased entrepreneurial intention. Customer identification, investment presentation and the structuring of an idea into a plan are proposed to be prioritized learning modules in the contingency model. As business plans provide an important foundation in entrepreneurial education, its pedagogical framework should be revised in order to accommodate a more open-ended approach. With this study, we hope to contribute to a more dynamic pedagogical entrepreneurship education.

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