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Entrepreneurship Education Pedagogy: Using Technology to Learn About Fundable Business Plans

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Abstract

There is a growing need for models and pedagogy that assimilate state of the art academic research with practical knowledge and input from strategic stakeholders. In this paper, we present a web-based venture readiness assessment tool crafted with input from focus groups and surveys of equity investors (angels and venture capitalists) and entrepreneurs. The tool was designed to provide a framework for first-stage screening for investment decisions in technology business ventures. This assessment tool has been successfully used to teach students in the university setting how to determine the likelihood of gaining equity investment. We present the results of the application of this assessment tool based on an experiment with 140 graduate and undergraduate students, including examples for using this pedagogy in the classroom.

Introduction

The business plan is considered by many as one of the first steps toward the creation of a venture (Delmar and Shane 2004; Honig and Karlsson 2004; Liao and Gartner 2006; Shane and Delmar 2004). The business plan's value is in its ability to convey the goals of the firm, the intent of the founders, and the promise of future value for the venture. A well-crafted business plan is one of the most important communication tools for an entrepreneur and provides a sense of legitimacy to the firm and the founders. The lack of a good business plan may be perceived as a lack of intent or commitment on the part of the founder(s) (Salancik 1977).

Many entrepreneurs discover that the preparation of a well-crafted business plan can be a daunting task. A well-written plan is concise, yet comprehensive and requires a myriad of decisions about all aspects of new venture creation, from exploiting the opportunity to garnering resources and building the top management team. Constructing a convincing business plan requires a deep understanding of the product, the competitive landscape, the business model, and the prospective financial model. However, understanding the business is not enough: a business plan must also be persuasive. Shaping a compelling business plan also requires marketing and strong communication skills.

A business plan is often required when entrepreneurs can least afford to invest time into the effort of creating one. Early stage companies are demanding, and little time is left to devote to shaping a convincing document for investors and other stakeholders. However, in most cases it is nearly impossible for someone outside of the company founders to effectively develop a compelling business plan.

The process of learning is influenced by, and results from, the interaction of three areas of influence: agent, activity, and world (Lave and Wenger 1991). In their examination of the internet as a learning tool, Oliver, Harrington, and Omari (1996) suggested a model based on three mutually constitutive elements to describe roles and responsibilities within the learning process: the learner, the implementation, and the interactive multimedia program. These three elements correspond to the role of the teacher, the learner, and the materials themselves in the instructional setting.

In an effort to develop pedagogy for teaching students what makes a plan fundable versus not fundable, the authors sought a method to expose students to examples of business plans and tried to create an environment where they would be able to learn key success factors and mistakes made in business plan writing in an interactive multimedia environment. Toward this end, we adapted a web-based assessment tool that the we had created for use in the classroom. This paper outlines the rationale and process we used to create, test, and utilize this new pedagogy.

Business Plans and Entrepreneurship Education

A business plan can be defined as a document that is used by a firm to describe both its current state as well as its proposed future (Honig 2004; Honig and Karlsson 2004). It is a vehicle commonly used by a company founder to communicate the vision and strategic and tactical plans for the venture (Busenitz, Fiet, and Moesel 2005; Simon 1997; Van de Ven 1980). The business plan can show internal consistency (Shane and Delmar 2004) and may demonstrate that the founder is committed to the venture (Salancik 1977), and in turn increase the cognitive legitimacy of the firm (Aldrich and Fiol 1994). Moreover, writing a business plan before adopting customers, promoting the firm, or looking for funding reduces the likelihood that the venture will fail (Shane and Delmar 2004).

Goal-setting theory suggests that the process of writing about planning business activities before undertaking them may enhance actions as well as the performance of new ventures (Rousseau 1997; Shane and Delmar 2004). In other words, planning may facilitate the integration of goals into behavior (Bandura 1997) by identifying skills and information necessary to achieve those goals and by forcing the decision maker to prioritize and focus on the most important tasks to be achieved (Locke and Latham 1990; Simon 1997).

In addition, the business plan is often viewed as a necessary step in the funding process for an entrepreneurial venture. Research has shown that venture capitalists rely heavily on the business plan when making an investment decision in a new venture (Roure and Keeley 1990; Zacharakis and Meyer 2000). For a new venture to receive funding, it must pass an initial screening (review of the business plan) followed by a due diligence process (Tyebjee and Bruno 1984; Zacharakis and Meyer 2000; White, Hertz, and D'Souza 2009).

A review of the leading entrepreneurship textbooks shows that the most common model for teaching about business plans is based on the "outline approach," which typically provides students with a list and

condensed description of the most common elements found in a business plan (Table 1).

Author(s)	Business Plan Criteria
(Hisrich, Peters, and Shepherd 2005)	• Industry Analysis • Description of the Venture • Production Plan • Operational Plan • Marketing Plan • Organizational Plan • Assessment of Risk • Financial Plan
(Barringer and Ireland 2006)	• The Business • Management Team • Company Structure, Intellectual Property, and Ownership • Industry Analysis • Marketing Plan • Operations Plan • Financial Plan • Critical Risk Factors
(Bygrave and Zacharakis 2004)	• Industry and Competitor Analysis • Company and Product Description • Marketing Plan • Operations • Development Plan • Team • Critical Risks • Financial Plan
(Timmons and Spinelli 2006)	• The Industry, the Company and its Products/Services • Market Research and Analysis • Economics of the Business • Marketing Plan • Design and Development Plans • Manufacturing and Operations Plans • Management Team • Overall Schedule • Critical Risks, Problems, and Assumptions • Financial Plan • Proposed Company Offering
(Frederick, Kuratko, and Hodgetts 2006)	• Business Description • Marketing • Operations • Management • Financial • Critical Risks • Harvest Strategy • Milestone Schedule

Table 1. Top-Selling Entrepreneurship Textbook Chapters on Business Plan Criteria (www.amazon.com; www.barnesandnoble.com)

The outline approach to business plan pedagogy requires a comprehensive and prioritized list of the elements required in a business plan. Previous studies have found that venture capitalists (VCs) base their decisions on three main categories: 1) entrepreneurial/team capabilities, 2) product/service and market characteristics, and 3) financial needs of the firm (Fried and Hisrich 1994; Macmillan, Siegel, and Narasimha 1985; Macmillan, Zemann, and Subhanarasimha 1987; Tyebjee and Bruno 1984; Wells 1974).

However, as can be seen in the Table 2, the numbers of new venture screening criteria suggested by prior studies are inconsistent (Cooper 1993; Gartner, Starr, and Bhat 1999), and findings are based on varying definitions of terms. Thus, it could be argued that investment decisions are much more complex than a prioritized list of variables and that this method of teaching business plans does not reflect the nuances involved in the selection process.

Author(s)	Sample	Method	Criteria by importance
(Wells 1974)	8 VCs	Personal interviews	(1)Management commitment (2) Product (3) Market
(Poindexter 1976)	97 VCs	Mail survey	(1) Quality of management (2) Expected rate of return (3) Expected risk
(Tyebjee and Bruno 1981)	46 VCs	Phone interviews	(1) Management skills and history (2) Market size/growth (3) Rate of return
(Tyebjee and Bruno 1984)	41 VCs		(1) Market (2) Product (3) Management capabilities
(Macmillan et al. 1985)	102 VCs	Mail survey	(1) Capable of sustained intense effort (2) Familiarity with the target market (3) Expected rate of return
(Macmillan et al. 1987)	67 VCs	Mail Survey	(1) Market (2) Competition
(Goslin and Barge 1986)	30 VCs	Mail survey	(1) Management experience (2) Marketing experience (3) Complementary skills in team
(Robinson 1987)	53 VCs	Mail survey	(1) Personal motivation (2) Organizational/ managerial skills (3) Executive/managerial experience
(Rea 1989)	18 VCs	Mail survey	(1) Market (2) Product (3) Team credibility
(Dixon 1991)	30 VCs	Personal interviews	(1) Managerial experience in the sector (2) Market sector (3) Marketing skills of management team
(Muzyka et al. 1996)	73 VCs	personal, standardized interviews	(1) Leadership potential of lead entrepreneur (2) Leadership potential of management team (3) Recognized industry expertise in team
(Shrader, Steier, McDougall, and Oviatt 1997)	214 new ventures with IPO	interviews, publicly available documents	(1) Technical education (2) New venture experience (3) Focus strategy

(Shepherd 1999)	66 VCs	Conjoint experiment	(1) Industry related competence (2) Educational capability (3) Competitive rivalry
(Shepherd et al. 2000)	66 VCs	Conjoint experiment	(1) Management team (2) Expected risk (3) Competitive rivalry
(Kaplan and Strömberg 2001)	10 VCs	Interviews and surveys	(1) Market (2) Product (3) Competition

Table 2. Prior Research on VC Investment Criteria and Their Findings (Adapted from Nikolaus, Gruber, Harhoff, and Henkel 2007; Zacharakis and Meyer 2000)

Research on learning suggests that application helps individuals develop stores of accessible knowledge that can be utilized in similar future situations (Cope 2005; Kim 1993). In business school literature, the importance of skills acquired through practical experience is well documented, and it is commonly accepted that students need to bridge the gap between theory and practice (Gavetti and Levinthal 2000; Strong et al. 1994; Wroblewski 1991). Similarly, research has suggested that entrepreneurship education is enhanced through the addition of application-based problems to more traditional theory driven or transmission models of learning (Harrison and Leitch 2005; Kolb 1984). It has been widely acknowledged that learning within the entrepreneurial context should be applied in nature (Collins and Moore 1970; Deakins, O'Neill, and Mileham 2000; Minniti and Bygrave 2001; Politis 2005). This pedagogy, sometimes encapsulated in the broad area known as experiential learning, enhances learning by engaging students deeply in the learning process.

We suggest that an effective method for teaching skills associated with writing a business plan may be achieved through a process of translating academic research into pedagogy that may be useful in the classroom. Moreover, we suggest that in the particular case of teaching skills associated with understanding essential criteria of a business plan, the appropriate pedagogies are similar to those used to teach a craft.

A craft is commonly defined as an art, trade, or occupation requiring special skills. Proper understanding of a craft, such as medicine or architecture, requires students to gain both procedural knowledge as well as declarative knowledge (Anderson 1976/1983). This is also true for a field such as entrepreneurship, and business plan criteria in particular. Declarative knowledge can be understood as information that people can clearly report, of which they are consciously aware (e.g., facts) (Turban and Aronson 1998), and that can be acquired from textbooks (Ambrosini and Bowman 2001). Procedural knowledge, on the other hand, refers to expertise that people find difficult to verbalize. This type of know-how can be acquired through practice and is generally more difficult to capture and teach (Ambrosini and Bowman 2001).

Academic learning usually consists of offering information in a consistent and predictable way (Honig 2004), where students are allowed to "review, digest, and repeat" (Honig 2004) solutions to problems that have been previously dictated, while demonstrating proficiency in exams (Honig 2004). It has been argued that this model does not work well in situations where students are asked to tackle dynamic problems that are commonly faced by entrepreneurs (Honig 2004; Mintzberg and Gosling 2002; Wood 1995). Traditional approaches to teaching entrepreneurship often do not completely facilitate deep learning within students. This in turn may increase the gap between academia and practice and make it difficult for students to apply what they have learned (Ball 1995; Gibbs 1992). However, by involving students in the design process, as is done when learning any craft, they are placed in a problem situation and must work to integrate prior knowledge and identify alternative solutions.

The importance of experiential learning is not a new concept in education. We now have many years of research and application with a wide variety of models for experiential learning. For example, more than fifty years ago, Piaget (1950) discussed the use of simulations or experiments to engage students and allow them to "construct" meaning from these experiences. Other researchers such as Resnick (1987) later identified gaps between theoretical learning in the form of formal instruction in the classroom and real life applications of the knowledge. Brown et al. (1989) suggested that a need exists to "enculturate students into authentic practices through activity and social interaction" (37). In other words, if knowledge is to be successfully acquired, it must be presented in authentic settings, and should facilitate interaction (Lave and Wenger 1990). In order for a pedagogy to be effective, the problem specified needs to be "credible, relevant, and illustrative" (Honig 2004) of the situation being studied. Learning is viewed as a process of becoming associated with others in a population by collaborating with them and having related experiences (Brown and Duguid 2001). Researchers identified five common features found in all the successful models of education: apprenticeship, collaboration, reflection, coaching, and multiple practice (Brown, Collins, and Duguid 1989; McClellan 1991). They suggested that while it is important that knowledge is gained through application, the context within which the learning actually occurs could be a surrogate of the real environment (McClellan 1994) .

While the notion of this kind of applied learning is easy to understand, we have learned that the implementation of such learning techniques in classrooms, especially in the case of entrepreneurship education, is far from easy. For example, apprenticeship is a teaching method used in fields such as medicine and architecture, where individual coaching is used to learn a craft. This process involves a continuous dialogue between the educator and the students, where the educator uses "think aloud through protocols," which make the task and the application supporting the task transparent and available to the students (Wroblewski 1991). This apprenticeship is usually practiced in a monitored, risk-free environment, where errors are explained and individuals learn from direct experience (Wroblewski 1991). This method, though ideal for training students, is extremely costly and time consuming (Piaget 1950).

Technology is often used to reduce cost in time and money. In order to address the challenges of sharing knowledge about what makes a business plan fundable, we turned to technology and adapted an assessment tool created for use by technology entrepreneurs.[1] The assessment tool was originally developed for use in a statewide economic development program designed to help technology entrepreneurs prepare for and obtain equity funding. The following describes our process for adapting, testing, and applying the assessment tool to the entrepreneurship education classroom.

The Model

Using the assessment tool in the classroom required obtaining business plans for students to evaluate. To that end, we obtained 143 business plans from venture capital firms and asked the providers to identify the plans that had been funded and those that were not funded. Approximately half of the plans were funded and half were not. We then tested the assessment tool with 140 graduate and undergraduate students at a Midwestern public university to evaluate whether students could use the tool effectively. Following the test, and over the past four years, we have used the assessment tool in a variety of graduate and undergraduate classes. The following describes the test and the subsequent classroom experiences in four different entrepreneurship classes.

1 For the key variables in the assessment tool see the Appendix. For a full description of the development of the assessment tool, please see White, Rebecca J. , Giles Hertz, and Rodney D'Souza. 2004. Applying the stewards of place model: Integrating teaching, research and service through entrepreneurship education. *Journal of Entrepreneurship Education* 7: 95-105.

The test

Within the protocol of an experiment, students were provided access to two plans each. All plans evaluated described technology companies and had been submitted to venture capital firms for prospective investment. The business plans and industry information was provided to students based upon personal information gathered from the students prior to the experiment, which included education level and work experience. Students who had experience in, or extensive knowledge about, a specific industry were determined to have prior knowledge that might bias their evaluation of the business plan. An attempt was made to confirm that students were novices with respect to the industry space of the business concepts they were evaluating and thus that their decision would be based solely on the general industry knowledge provided to the students by the researchers. The students were provided copies of industry information[2] based upon the industry assigned and the year the business plans had actually been evaluated by the venture firms, and were asked to study the information prior to the evaluation of the business plan. They were also encouraged to use this information during the evaluation process.

After reading the industry information and the business plans, students used the assessment tool to make a recommendation regarding investment. For each plan, students provided a simple "Invest" or "Do Not Invest" response. We compared the investment decisions of 140 graduate and undergraduate students to the decisions made by investors and found that student evaluators (both graduate and undergraduate) were able to match the decisions of professional investors 65.4% of the time when evaluating funded plans and more than 80% of the time when evaluating plans which were ultimately not funded (White, Hertz, and D'Souza 2009).

Classroom use

During the past four years, we have used the assessment tool in both graduate and undergraduate classes to illustrate techniques associated with writing business plans for technology companies. Students are typically provided access to the database of business plans, as well as the assessment tool, and are asked to read assigned plans and complete assessments. The students are then asked to complete a variety of assignments including class discussions, writing summary papers describing their assessment of the plans (both content and presentation) and rationale for investment decisions. The assessment tool has been used in four different types of classes, including three undergraduate classes (New Venture Creation, Managing Entrepreneurial Firms, and Writing the Business Plan) and a graduate class (Entrepreneurship and Innovation). The assessment tool has proven to be especially valuable as a way of illustrating business plans that are likely to receive investment as compared to those unlikely to receive investment. In addition, the assessment tool offers the option to evaluate businesses at three different stages of development: concept, growth, and venture. Professors have used the assessment tool to illustrate the different expectations of potential investors at varying stages of business development. In sum, the exercise more closely replicates the complexity of investment decisions than the typical case study or textbook business plan outline, and has provided excellent opportunities for experiential and applied learning within the classroom. See Diagram 1 for its application in selected classes.

The consensus from the four professors is that students who have used the assessment tool have improved their ability to write high quality business plans and greatly expanded their understanding of the investment process for technology firms. Future research should focus on developing quantitative outcome measures for comparing students who use the tool to those who do not.

2 Industry information was gathered using the S&P 500 indexes and the Hoover's industry databases for the years the ventures were funded.

Discussion

We began by looking for a better way to prepare students to understand the structure, meaning, and importance of concepts, behaviors, and skills required for writing fundable business plans for technology enterprises. We suggested that this could be achieved using an experiential learning approach. The results of this experiment indicate that the importance, meaning, and structure of the criteria used by practitioners can be transferred to students using this approach.

In a previous study, we found that experts and students using the assessment tool did not differ in terms of the overall decision to fund or not fund the business plan. This is an important finding for educators and students. From the educator's perspective, the results of this study suggest that using pedagogical theories such as the one described can be useful in teaching a craft such as entrepreneurship. From a student's perspective, this finding suggests that individuals can be better prepared when dealing with situations such as approaching VCs for funding.

Interestingly, the results of the previous study do not show significant differences between graduate and undergraduate students. This leads us to suggest that this format is suitable at the undergraduate as well as the graduate level of education. Based on the findings of this experiment, we suggest that this method may be used to effectively teach students about the importance, structure, and meaning of business plan criteria, which will in turn help them when they are seeking venture money.

Conclusion

This paper provides an example of how we can inform our teaching with applied learning techniques based upon academic research. Writing a business plan is one of the most common, and often considered one of the most important, assignments in nearly all entrepreneurship education programs. In fact, we often evaluate the success of our educational efforts by the ability of our students to win business plan competitions and, more importantly, write a business plan that is funded by investors. Further, an effective business plan is also one of the most challenging tasks for any entrepreneur. The need for a plan often occurs when an entrepreneur is busy with the survival of an early stage company and when the entrepreneur cannot afford to "buy" help with the design and writing of the plan.

This paper provides some insight into the use of a teaching pedagogy that can help in teaching students the skills associated with the design and crafting of an effective business plan.

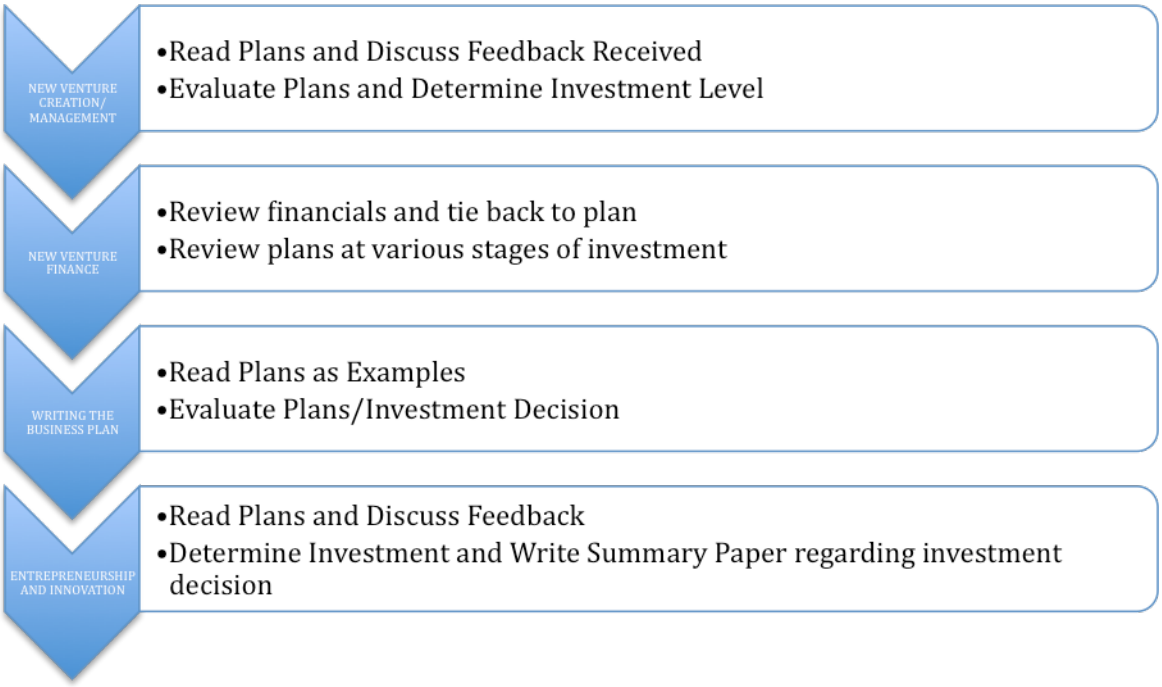

Diagram 1. Examples of Application

Appendix: The Expert Based Tool (EBT) used to Evaluate Business Plans

No.	Criterion	Characteristic (Weights)		
1	**Market size**	Large, rapidly growing market (40)	Large market amenable to rapid growth (30)	Mature shrinking market (-40)
2	**Customer adoption**	Customer adoption likely (40)	Customer adoption possible (20)	Unpredictable customers (0)
3	**Revenue potential**	Significant revenue generated (40)	Revenue generated (30)	Potential for revenue (20)
4	**Competitive market**	Insignificant competition and or emerging industry (30)	Fragmented competition with no dominant players (20)	Intense rivalry among existing companies, substantial barriers to entry. Numerous substitutes exist (-30)
5	**Competitive strategy**	Effective distinctive and sustainable strategy (50)	Potential for replication (0)	Ineffective or easily replicated (-50)
6	**Entry timing**	Optimal time to enter the industry (50)	Ambiguous industry trends, timing uncertain (0)	Unadvisable to enter the market under current industry conditions (-50)
7	**Intellectual property**	Strong IP position (25)	Moderate IP position (15)	Weak IP position (-25)
8	**Technological advantage**	Relevant technological advantage, unique product/service characteristics (25)	Dormant technology (15)	Disruptive technology (10)

9	**Value added**	High value (significant customer need solved effectively) (100)	Moderate value to customers (50)	Low to minimum impact (-100)
10	**Product margins**	High Margin (100)	Moderate Margin (50)	Low Margin (-100)
11	**Startup experience**	Entrepreneur has substantial startup experience (50)		No relevant startup experience (-50)
12	**Industry experience**	Entrepreneur has pertinent industry experience (50)		No relevant industry experience (-50)
13	**Leadership experience**	Entrepreneur has CEO experience (50)	Entrepreneur has high-level management experience (25)	Entrepreneur has Leadership experience (10)
14	**Team experience**	Well balanced, team- and goal-oriented (100)		Weak team(-100)
15	**Strategic partners**	Existing network of value adding strategic partners (25)	Partnership opportunities exist (10)	Unable to obtain strategic partnership