A Conceptual Framework for Implementation: Necessary and Sufficient Conditions for Southeast Angel Investments

Dr. Andrew J. Czuchry, East Tennessee State University

A rocket scientist, Andrew J. Czuchry received his Ph.D. from the University of Connecticut in 1969 and was inducted into the Academy of Distinguished Engineers in 2011. Prior to joining East Tennessee State University in 1992, Dr. Czuchry served as President of IRISS, a $150 million joint venture between Raytheon and General Dynamics. He is a tenured full professor and holder of the AFG Industries Chair of Excellence in Business and Technology. He received the Ned R. McWherter Leadership Award in 2006 and the 2012 Association for Global Business award for contributing extensively to promote global education in cooperation with businesses. He has coauthored more than 110 articles in refereed journals and proceedings of professional organizations related to his field.

Dr. Shawn A. Carson, University of Tennessee

Dr. Shawn A. Carson Lecturer Haslam College of Business University of Tennessee at Knoxville

Dr. Carson is currently serving with the faculty at the Haslam College of Business at the University of Tennessee where he teaches courses in Entrepreneurship, and he is the coordinator for the Minor in Entrepreneurship curriculum. Carson also directs the University’s I-Corps Regional Node, a program sponsored by the National Science Foundation to encourage commercialization of technology by training researchers in Customer Discovery. Carson recently completed a doctoral dissertation entitled "Identifying Critical Risk Factors in the Decision-making Process of Angel Investors and Venture Capitalists: A Delphi Research Study".

In addition to teaching responsibilities, Carson is also involved with the Anderson Center for Entrepreneurship and Innovation, a donor sponsored support program for students and faculty who are interested in starting companies. Over the last 5 years, the Anderson Center has distributed over $500,000 in startup capital. Carson coordinates a program called Vol Court, which is an elevator pitch competition for students and faculty. The Anderson Center has a three-pronged mission to develop entrepreneurial talent, help build the overall entrepreneurial community and to conduct applied research in entrepreneurship. Carson is fully involved in all three aspects of this mission.

Carson also serves as Director of Advisory Services with 3 Roots Capital, a provider of impact capital products and advisory services that create successful outcomes for client companies and community partners while generating attractive returns for financial partners. 3 Roots Capital is a Community Develop Financial Institution and specializes in providing debt capital to businesses located in economically disadvantaged areas.

Prior to starting his academic career at the University of Tennessee, Carson spent 10 years with Technology 2020, an organization that supported entrepreneurial startups in Oak Ridge Tennessee. During that time, Carson developed accelerator programs and workshops for a number of different programs around the state of Tennessee. Notably, he created curricula and delivered programming for an agricultural accelerator in rural northwest Tennessee, an automotive accelerator in southern middle Tennessee and a general business accelerator program in Johnson City in northeast Tennessee. Carson also deployed a 3-year project funded by the Appalachian Regional Commission to support small businesses in Campbell County Tennessee, a rural and economically distressed community. Carson supported over 200 startups during his time with Tech 2020 through business model development and the raising of equity based growth capital.

Carson has also been a founder of 3 startups including Fertility Focus, an agricultural business that helped cattle farmers increase the fertility rates in cattle production.

Dr. Carson’s rich experience as an entrepreneur, educator and interest in applied research have positioned him to pursue an interest in understanding the unique needs and challenges of entrepreneurship in rural and economically disadvantaged areas, where there is a measured lack of support, growth capital, and general entrepreneurial culture.
Dr. James H. Lampley, East Tennessee State University

Dr. Lampley received his Ed.D. from East Tennessee State University and currently serves as a Professor and Research Specialist in the Educational Leadership and Policy Analysis Department at ETSU. Dr. Lampley has been an ELPA faculty member since 2004. As a Research Specialist he works with dissertation students on quantitative research topics. Dr. Lampley also serves as the Graduate Program Coordinator for the Post Secondary and Private Sector Leadership concentration in the ELPA department. Dr. Lampley teaches a variety of courses including Research Methods, Educational Statistics, and Quantitative Analysis. Currently, Dr. Lampley has research interests in online delivery and graduate education and spearheads research opportunities as often as possible.

Dr. William H. Knight, East Tennessee State University

Dr. Knight received his Ph.D. from Kansas State University. He was on the faculty of Purdue University prior to joining the faculty at East Tennessee State University in 1986. He served as Department Chair, Associate Dean, and Dean of the Clemmer College of Education. Professor Knight currently teaches courses in Organizational Theory, Leadership, Administration of Higher Education, and Policy Analysis. He also serves as dissertation advisor for students who employ mixed methods approaches and specializes in the use of the Delphi Method.
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Abstract

The purpose of this paper is to suggest a framework/process approach to guide teaching technology based entrepreneurship at the graduate level. The necessary conditions for engaging angel investors have been well documented in the literature. However, over the past 20 years less than 4% of those submitting comprehensive business plans are actually given offer sheets by angel investors. Figure 1 offers a conceptual framework for teaching the business planning process. The first three steps are essential to get to a business plan with the necessary conditions to be able to get to an offer sheet from an angel investor. These are documented in the right hand column of step four in Figure 1. The left hand column offers an improved list of relationship factors based upon our current research. These relationship factors are now taking on equal importance to the right hand column. This is a fundamental contribution in the current article.

Shawn Carson’s doctoral dissertation researched the angel investor process in the Southeast United States using a Delphi method [1]. A major finding of this research was that among the comprehensive list of factors critical to decision making process of investors, the relationship factors ranked higher in importance as a category than objective based risk factors. In this Delphi study of angel investors and venture capitalists eight of the 20 or 40% of the critical risk factors identified in the top quartile importance were relationship based factors (see Table 1). This is a Eureka moment for us because we had not underscored the relationship factors in the past so this is a major addition to our framework for teaching technology based entrepreneurship. In the past we had the output from the real opportunity test that gave us the right hand column in step four. That was the end of our teaching. Now we are adding the relationship factors that are equally important to the necessary conditions. This will give us enhanced results with angel investors. This ranking of relationship factors was more important than management team and surprisingly of greater importance than financial risk. What makes this finding so important is that in the early stages of the decision making process this is one of the most obscure reasons. The addition of these relationship factors should provide the sufficiency conditions for obtaining an angel investment offer in the Southeast. While many of the investors discuss the importance of passion and coachability few acknowledge these relationship aspects as more important than traditional measures such as market size and team execution. This research suggests that relationship oriented characteristics when evaluated alongside objective risk factors were more important.

Introduction

We have been teaching this material for 20 years. The relationship factors were a major discovery for us and we believe that by including them our graduates from our entrepreneurial leadership technology based graduate program will enhance their success rate from the current level of 4%. These will become sufficient conditions to satisfy angel investors in the Southeast.

Starting in 1994 our graduate program in technology based entrepreneurship emphasized four areas of risk for start-up ventures [2]. These are presented in the graduate class introduction as
the four R’s of entrepreneurship. Fran Jabara (Dean of the College of Business and Founder of the Center for Entrepreneurship at Wichita State University) in 1994 introduced these four R’s during his Executive Briefing at East Tennessee State University and we found them to be true ever sense. These four R’s of entrepreneurship are: **Resources** are expended to capture **Rewards**; **Risks** must be mitigated during dynamic process over time; **Resources** are placed at **Risk** to gain a **Reward**, for which the entrepreneur places his **Reputation** at risk. The risk itself must be mitigated to successfully get to the final stage in the angel investment process. It is to be noted that the entrepreneur’s reputation is really based upon business relationships and these relationships have been demonstrated in an ad hoc fashion. What we are doing now is formalizing that process which will hopefully enhance the success rate of our entrepreneurs.

**Figure 1**

A Conceptual Framework for Implementation is Comprised of Four Steps
Table 1

Ranking of Critical Risk Factors with at least 70% Consensus

<table>
<thead>
<tr>
<th>Critical Risk Factors</th>
<th>Mean Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Founders and Management Team Factors - Ability to execute</td>
<td>5.00</td>
</tr>
<tr>
<td>Relationship Factors - Trustworthiness</td>
<td>5.00</td>
</tr>
<tr>
<td>Relationship Factors - Ethics/Honesty</td>
<td>4.94</td>
</tr>
<tr>
<td>Founders and Management Team Factors - Founder(s) commitment to startup</td>
<td>4.89</td>
</tr>
<tr>
<td>Relationship Factors - Integrity</td>
<td>4.89</td>
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<tr>
<td>Relationship Factors - Coachability</td>
<td>4.82</td>
</tr>
<tr>
<td>Founders and Management Team Factors - Perseverance</td>
<td>4.76</td>
</tr>
<tr>
<td>Relationship Factors - Character</td>
<td>4.72</td>
</tr>
<tr>
<td>Intellectual Property Factors - Competitive Advantage</td>
<td>4.71</td>
</tr>
<tr>
<td>Relationship Factors - Passion</td>
<td>4.67</td>
</tr>
<tr>
<td>Competitive Factors - Understanding of Competitive Landscape</td>
<td>4.67</td>
</tr>
<tr>
<td>Exit Factors - Potential for Good Return</td>
<td>4.67</td>
</tr>
<tr>
<td>Relationship Factors - Management 'skin in the game'</td>
<td>4.61</td>
</tr>
<tr>
<td>Relationship Factors - Transparency</td>
<td>4.59</td>
</tr>
<tr>
<td>Market Factors - Product/Market Fit</td>
<td>4.59</td>
</tr>
<tr>
<td>Value Proposition Factors - Clear and Unique Value Proposition</td>
<td>4.56</td>
</tr>
<tr>
<td>Legal Factors - No Pending or Existing Litigation</td>
<td>4.56</td>
</tr>
<tr>
<td>Scaleability Factors - Strategy for Growth</td>
<td>4.53</td>
</tr>
<tr>
<td>Scaleability Factors - Ability to Scale</td>
<td>4.50</td>
</tr>
<tr>
<td>Value Proposition Factors - Demonstrated Customer Discovery</td>
<td>4.44</td>
</tr>
</tbody>
</table>


The objective of this conceptual framework is to embed the necessary business planning and risk mitigation approaches to build a trust relationship between investors and the entrepreneurs. This is a highly nonlinear and dynamic process. In Figure 1 feedback loops are part of the Shewhart process. A linearization approach can be used if the steps are small enough. This could be a CAP-DO variant of the Shewhart cycle. This approach is where the linearization challenge comes in [3]. For example, when a massive redesign is necessary in the PLAN-DO-CHECK-ACT cycle the Just Imagine step is introduced from step 1 in the planning cycle. Teaching nonlinear thinking is one of the challenges in this arena. The business and technology narrative is one way of accomplishing this task [4]. Financial risks are mitigated somewhat by the angel investors process itself. But in the end they still have to address the nonlinear events and oftentimes the business narrative, i.e., storytelling, is helpful. Risk mitigation is vital and project management can be tailored to help conduct this formal risk mitigation approach. Coaching points for tailoring project management risk mitigation are given in the article by Myers, Czuchry, Sr., Czuchry, Jr. and Trent [5]. A systems framework from the Baldrige Performance...
Excellence guidelines provides the underpinning for this framework [3]. One valuable lesson learned is the need to introduce a formal review process early in the semester ideally in week five of a 14 week semester. Feedback from this panel provides valuable guidance to the student teams but also helps to build a trust relationship between the angel investors and the graduate student entrepreneurs. Another coaching point for teaching entrepreneurship is that this trust relationship is now of equal importance with the other considerations and the how is something that has to be enhanced in teaching technology based entrepreneurship in the Southeast.

Relevant Literature

Engineering entrepreneurs are value creators. Working with customers or clients they first identify a significant problem and then develop a solution that adds value. This can be contrasted with classic entrepreneurs who are generally risk takers. As indicated by one of the reviewers for our paper the engineers are not taking risks for the sake of high risk-high reward. Angel investors and venture capitalists provide “risk capital” in exchange for relatively large portions of ownership in a new venture.

The data support the notion that investing in startups carries risk. The odds of an entrepreneur receiving funding from an angel investor is less than 3% [6]. Yet, only 11% of these investments eventually lead to a positive return [7].

Risk, in its truest sense of the word, is ever-present in the world of startups. This historical parameter of angel and venture capital performance is a non measurable variable. Once risk can be identified and quantified, the process of risk mitigation begins with development of frameworks and processes in an attempt to manage and reduce risk. This arena has been well researched in works of Korver [8] who developed Decision Analysis to help control biases on the part of investment decisions, Payne [9] who proposed a methodology risk mitigation through a process of valuation, and Hirai [10] who introduced a quadrant framework to objectively evaluate risk by assigning categories to identify characteristics that would cause a company to fail. The multitude of research and experience applied to this endeavor has produced an extensive study of risk categories, useful for both entrepreneurs and investors. Streletzki and Schulte [11] identified five major groupings of selection criteria as follows: the founder team, the company, the product, the market, and financial criteria. It is common to hear about the “Big Four” risks from investor panel discussions, which include the team, the market, the technology and funding. This has been well documented and commonly applied in the instruction of entrepreneurs, from more formal education in institutions, to the accelerator programs that aim to prepare entrepreneurs to get investments by close mentoring and direct experience. In the end, the arduous process of due diligence, which occurs toward the closing of an investment deal, is a very detailed exercise in which every known risk with respect to the new venture is identified and evaluated. Yet, still only 11% of the deals yield a return of any kind.

Despite this extensive understanding and research in risk mitigation methodology, there is a realm in this process that continues to be overlooked and this realm has to do with something that is associated or even confused with risk and risk taking. Folta discussed risk as quantifiable based probabilities observed from historical data [12]. Entrepreneurs and new markets often have no history and therefore no data from which to derive the probabilities. It was Schendel
who pointed out that entrepreneurs lived in a world of uncertainty and must deal with high levels of ambiguity [14]. Uncertainty is the broad category of intangible or unknowable risks. Since these elements are, by definition, not measurable their treatment in formal instruction has largely been anecdotal or omitted in favor of better researched risk categories. The entrepreneur is left to discover this realm through experience, which can be very expensive when it involves failure. Another implication is that due diligence and other risk mitigation frameworks are time consuming and very expensive, with deals often taking anywhere from three to 18 months to close [15].

Some researchers have begun to study uncertainty and categories are beginning to emerge. Investors commonly use intuitive shortcuts, or heuristics to help reduce the sheer magnitude of potential deals down to a number they can manage within their available time constraints. In fact, these heuristic methods are generally accurate and involve how the investor seeks to find a fatal flaw early and kill the deal quickly. Maxwell, Jeffrey and Lévesque [16] found eight distinct categories or decision criteria relative to this use of heuristics:

1. Market Potential – measured in terms of market size.
2. Product Adoption – the extent to which markets had been penetrated. Commonly known as market share.
3. Protectability – intellectual property such as patents and trademarks.
4. Entrepreneur Experience – reputation and record of past entrepreneurial experiences
5. Product Status – referring to the stage of product development.
6. Route to Market – sometimes known as a go-to-market strategy, or how the product will be found by the customer.
7. Customer Engagement – validation that customers will in fact, buy the product.

These categories can largely be quantified, either by specific numbers, or by binary means such as whether or not the technology is protected by patents. Nonetheless, it provides a framework for educators and mentors to help entrepreneurs address these categories as legitimate concerns of potential investors. Notice that these categories are treated in classic education and provide the necessary conditions included in the right hand side of step four in our conceptual framework.

Relationship Risks

Maxwell and Lévesque identified a relationship between behaviors related to relationship risk and investment decisions in the early stages of decision making (see Table 2) [17]. When quantified these relationship factors are a) different and b) have greater weight than previously anticipated. See the left hand column in step four of the conceptual framework.

Much has been discussed about the availability of objective, risk mitigating frameworks and the emergence of the “soft skills”; those categories of relationship-based risks. Entrepreneurship education has done a good job of incorporating the former into curriculum and pedagogy and perhaps the latter will find its way as well. But little if no research has considered the interaction between these two realms and their relative importance to each other in the decision-making process of investors.
Table 2
Summary of Relationship Risk Factors

<table>
<thead>
<tr>
<th>Ranked list of Relationship Risk Factors</th>
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<tbody>
<tr>
<td>1. Competence</td>
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<tr>
<td>2. Accuracy</td>
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<tr>
<td>3. Explanation</td>
</tr>
<tr>
<td>4. Openness</td>
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<tr>
<td>5. Consistency</td>
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<tr>
<td>6. Judgement</td>
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<tr>
<td>7. Alignment</td>
</tr>
<tr>
<td>8. Receptiveness</td>
</tr>
<tr>
<td>9. Benevolence</td>
</tr>
<tr>
<td>10. Disclosure</td>
</tr>
<tr>
<td>11. Reliance</td>
</tr>
</tbody>
</table>


The findings from Carson’s research concluded that relationship factors take on a higher importance than the traditional category [1]. In a Delphi study of 18 angel investors and venture capitalists, 8 of the 20 or 40% of the critical risk factors identified in the top quartile of importance were relationship-based factors (see Table 1). This was more than management team and surprisingly of greater importance than financial risks.

Conceptual Framework

Guided by the Baldridge Performance Excellence Criteria and systems engineering technique we show four steps in Figure 1 as Ideation; Innovation - A Practical Implementation; The Real Opportunity Test; and the Critical Risk Factors. Often it is helpful to start with a customer’s non-linear problem. Then identify ideas that could solve step 1 for teaching in the conceptual framework. Baldridge criteria in systems engineering techniques are deployed in the Ideation step in the overall teaching of the entrepreneurship process. Following the framework in Figure 1 we generate in dialogue with a customer to go from a non-linear idea to a funded project plan [18]. We refer to this as technical support to the marketing of technology innovation. The inputs and outputs shown in Figure 1 provide the dynamics for the overall entrepreneurship process. Step one consists of Idea Generation. Lateral thinking or drawing on the right side of the brain are examples of the non-linear Idea Generation event. The output is something you might imagine can happen. Now we have to have an Innovation step that is a practical implementation for this idea.

In manufacturing, for example, a formal process approach can be deployed by looking at best practices and/or designing six sigma lean thinking process improvements. Automation comes in there. See the feedback loop between practical implementation and idea phase (See Figure 1). This is a PLAN-DO-CHECK-ACT or PLAN-DO-STUDY-ACT cycle and you may have to complete this loop several times to converge to the practical implementation and the problem you are solving, step two in the process. This illustrates the feedback loop between steps one and two. You get enough value created by the innovation to ensure that a customer is willing to pay a premium to receive the value added. This is what the real opportunity test is in step three. Again, you may have to do this several times with a modified PLAN-DO-CHECK-ACT because
the non-linear step will be high. Linearization is no longer valid. You have to go to non-linear thinking to get the value you are looking for. This requires iteration between the Innovation step and the Real Opportunity step. Often times it helps to partner with someone who has access to the total system approach you are using.

The innovation that we are selling has to be fundamental to the non-linear problem we are solving. Hence the value added will be sufficient enough to attract a greenback customer willing to pay a premium for the value added. This is the fundamental criteria of the real opportunity test.

Illustrating the Conceptual Framework

Using the systems engineering approach and project management discipline Figure 1 illustrates our roadmap for teaching innovative entrepreneurship at the graduate level. These steps are: Step 1 Ideation; Step 2 Innovation – A Practical Implementation; Step 3 The Real Opportunity Test and Step 4 Critical Risk Factors.

For Existing Businesses

In 2005 three students entered our graduate class in Innovative Entrepreneurship and during a brainstorming session they identified an opportunity to utilize their Bristol Tennessee Electric Services (BTES) broadband capability for more than just reading meters. The students developed a comprehensive business plan and made an initial presentation to Dr. Mike Browder (CEO) and the BTES Board of Governors at week five. During that meeting Dr. Browder identified an additional value to the broadband capability which was enhancing the core competencies of the business. This was a key point because Dr. Browder is a key decision maker. He already had the credibility with his board that was discussed in step four.

During the Just Imagine step of the PLAN-DO-CHECK-ACT cycle he identified value to the core competencies and noted that we should evaluate how much improvement we get to fault isolation and detection with the broadband addition to the existing core electrical service business.

Take step one. The theme of generating ideas is the life blood of the entrepreneur. A business and technology narrative is suggested to help solve this nonlinear problem. The output from step 1 to step 2 and the feedback from step 2 to step 1 form a modified PLAN-DO-CHECK ACT. Take the loop which is “imagine it” from the Czuchry, Parker and Bridges paper [4]. This is an example of a highly nonlinear solution to a highly nonlinear problem.

Step 2 is the innovation that is a practical implementation of the idea generated in step 1. The Shewhart Cycle and non-linear problem solving with technology and business narrative were deployed and the implementation provides existing BTES electric customers with internet and telephone access. Initially the TV and video business was not profitable enough to warrant investment.
Step 3. The Real Opportunity Test was enhanced by Dr. Browder’s recognition of the payoff that occurred in their core electrical business and so in 2006 the initial capability was offered to the core business customers. Although the company was operating in the black in order to increase the subscription rate by BTES customers the video and TV were added to form the current BTES Triple Play in 2007. The initial investment was over $50 million (not bad for a school project). The company has operated in the black ever since.

In 2006 during the initial Board of Governors presentation students were asked how much it would cost for implementation if the 75% subscription rate was realized. The answer was it would cost $80 million. Here again the key to this getting approved was Dr. Browder’s recognition that the broadband capability would enhance this core business reliability in providing improved services for effective power delivery to electric customers. This is a major lesson to be learned. In an existing business you always have to enhance the core competencies of the business to ensure that your innovation can be effectively and efficiently deployed. So in 2007 the BTES Triple Play was launched and Bristol Tennessee Electrical System changed its name to Bristol Tennessee Essential Services. Because these three students were all employees of BTES their trustworthiness, ethics, honesty and integrity were proven because they had been long term employees of the company. Their passion was obvious from the enthusiastic work for the past six months and they were committed to start this new venture. The market strategy required a feedback to the real opportunity test to ensure that the video could be combined into the internet and telephone system to properly provide a Triple Play program. Although the financial picture was somewhat distorted it did not detract from the overall investment strategy and so the Triple play was launched in 2007 and has been profitable for over 11 years. This illustrated the conceptual framework for an existing business and BTES has served as a benchmark for Chattanooga and more recently Unicoi County. In 2018 BTES was recognized as the first utility to receive the National Baldrige Award.

Start-ups

Beth became a serial entrepreneur. She took what she learned at BTES and started The Motive Group as a consulting company in 2012. They successfully deployed the first three steps in the framework shown in Figure 1 and the three I’s from the Czuchry and Yasin article [18]. That was the start for step three in the framework. In 2016 Beth approached us for help. She had another idea for a business venture. Children needed a place to have fun and get exercise. She thought of a trampoline park as a new venture in Johnson City, Tennessee. We put together a student team to help her with this project. One of the key things we discovered was that as in manufacturing safety was a major concern. We did a failure modes and effect analysis and found that socks would be important for everyone to have to be safe. We also needed to have separate age groups. The third thing was that the maintenance for the pit had to be improved because it could smother a small child. Armed with this knowledge we were able to design the trampoline business so it was safe. This became the innovation in step two of the conceptual framework. A fringe benefit of this process resulted in some trade funding. The sock company effectively gave 90 day payment instead of a 30 day payment. In fact the sock manufacturer did so well when Beth decided to expand into the Bristol area she got funding from a bank as an existing business, an incredible accomplishment. She credited her methodology she learned back in the original BTES project with her success in both the Motive Group and the Just Jump
Trampoline Park. This is a highly unlikely accomplishment when she gained the bank’s financial trust to effectively treat her as an existing business. She had a high score in each of the relationship factors in step four of the conceptual framework which gave her the reputation as a highly trustworthy entrepreneur with integrity. These characteristics were quantifiable based on Beth’s experience as a successful entrepreneur. The challenge to educators is how do we get these factors enhanced without actual experience in an entrepreneurial venture. In 2016 Beth expanded to Bristol with the trade funding from the sock company and the bank loan. Beth expanded her business and Brent is following her idea with the Anytime Fitness project where he will expand from Johnson City where he has a viable business to Bristol. He used the same methodology we taught to establish a safe fitness program. We demonstrated the viability of the first three steps and the funding is coming from other sources. We should go back and underscore his credibility in these relationship factors to gain insight in how to teach the means of mitigating the relationship risks in column one of our conceptual framework. This is to be conducted as part of our continued applied research in teaching entrepreneurship at the graduate level.

Currently the first three steps in the framework lead to the necessary conditions shown in step four. Now the sufficient conditions are embedded in the second author’s research. Although we have identified a major improvement opportunity for engineering education as being soft skills/professional development skills at earlier ASEE conferences this still represents an opportunity for improvement in teaching innovative entrepreneurship at the graduate level. This opportunity is amplified because the requirements of the angel investors have also changed since 2000.

Summary and Concluding Remarks

In the previous subsection we demonstrated that the first three steps in Figure 1 are viable teaching methods for existing businesses and startups. The deal-relationship building has been previously done with company funds for existing business and Just Jump and Anytime Fitness franchise funding or a bank and trade credit approach was taught in Innovative Entrepreneurship. In this case we are looking at angel investors. One lesson we have learned is that angel investor attitudes have changed over the last 20 years. For example in 2000 we had an angel investor group that was looking at 18% compounded annually and wanted to invest money in ventures as a means of giving back to society for the blessing they had received in their lives. The angel investors themselves did not want to be identified. What we did was pick a topic, AIDS research. We identified two students in ETSU’s entrepreneurship class that were Ph.D. students in the biomedical program. After completing the business planning process in the course they were seeking funding to launch their business concept. Our angel investor group in 1999 structured a deal. They came up with a million dollar investment to pursue the business plan identified in the entrepreneurship class. We learned that the Federal Drug Administration (FDA) approval was six years long. This got us in a funding shortfall but we also learned that the biomedical field was a challenging one and we launched a phase 1 SBIR grant and completed it. After six years the company had an unsuccessful experiment with one of the major biomedical companies. We elected to put our intellectual property on hold and shut the business down. The angel investment group today is much more like a venture capital company than we were in those days. They want 38% compounded annually today vs. 18% the angels were looking for.
back in 2000. You have to have a different approach to get the offer sheet today than when ETSU first formed the angel investor roundtable. Today’s angel investor roundtable is much more risk adverse when looking for high return (38%) and tends to avoid the FDA approval cycle.

The step four and deal-funding relationship building is even more important than it was 18 years ago because the idealism factor of the angel investors has apparently changed. Angel investors of today have become more like the venture capitalists of 2000 and hence we must teach our students this relationship building model that is so imperative today. This a major contribution of this article and Carson’s research.

Tools that can be used to do this are:
- Lean Thinking & Six Sigma
- The Shewhart Cycle
- Nonlinear Problem Solving with the Technology & Business Narrative

The output of this is practical implementation. The input for the real opportunity test is market driven.

The feedback loop here between steps 3 and 2 is a CHECK-ACT-PLAN-DO because the improvement opportunities are going to be smaller. We use a CAP-CHECK-ACT-PLAN and DO approach to market the innovation itself.

It is important to note that an external review panel provides a check and balance on this teaching process. Five weeks of the semester we have students make presentations of their concepts and implementation ideas to an external review committee. This is important to get this input early because it gives you feedback and confidence that your idea will be a good solution to a real world problem. Also, because the chairman of the angel roundtable is a review member this starts the trust building relationship with the angel investors. The feedback between loops 2 and 3 provides the review panel’s feedback and guidance to the entrepreneurship team. Now step 4 gives us the essential criteria that must be met to get an offer from the angel investors.

The fourth step of the feedback can go from each of the steps from 4 to 3 and 2 to 1 depending on the severity of the change required. The dynamic process that takes place over the life cycle of the angel investment process tends to mitigate some of the risks. The criteria list in the fourth step provides guideposts for the entrepreneur’s chances of securing growth funding from angel investors. The necessary conditions have been effectively established over the last 25 years. However, the opportunity now is to improve on the relationship factors which have been a major discovery in this article.

References


