MENTORING AND FACILITATION IN ENTREPRENEURSHIP EDUCATION: BELIEFS AND PRACTICES

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ABSTRACT

Mentoring student teams is critical to entrepreneurship education, but the nature of that mentoring is often ill-defined, with little robust understanding of effective practices. To bridge this gap, this paper presents a qualitative study of mentoring practices in an entrepreneurship startup class. By combining classroom observations with semi-structured interviews from mentors and students, the data provide a complete view of mentoring behaviors and their salience within an entrepreneurship learning environment. Two frameworks guided data collection: problem-based learning and mentoring in capstone design courses. The results of this study describe six mentoring practices (coaching, pushing for explanation, protection, rapport, acceptance/conformation, and role-modeling) and explore how students value and respond to those practices.

Entrepreneurship Education: Lean LaunchPad and the Work of Mentors

Entrepreneurship education has existed within business schools for decades, but recently the number and quality of efforts across institutions have increased. Within engineering, in particular, a recent analysis demonstrates that these efforts take a range of forms, including majors, minors, specialized courses, clubs/social organizations, and living-learning communities (Besterfield-Sacre et al. 2011; Shartrand et al. 2010). Moreover, these efforts are not driven only by academic institutions; organizations supporting advances in entrepreneurship education include the National Science Foundation, the Ewing Marion Kauffman Foundation, the Kern Entrepreneurship Education Network (KEEN), and the National Collegiate Inventors and Innovators Alliance (NCIIA).

Within these efforts, one approach that has received significant attention is the Lean LaunchPad model of startup education, developed by Steve Blank, based on industry practice and experiential education (Blank May 2013; Blank and Dorf 2012). In courses that use this model, teams of participants explore the market and business model surrounding a potential startup idea. A *search* or learning process is used to develop a business model and, ideally, a successful business startup.

Key in Lean LaunchPad is extensive mentoring by experienced educators, entrepreneurs, venture capitalists, and other industry and entrepreneurship professionals. As young entrepreneurs move through the search process, these mentors provide an ongoing sounding board, helping students make sense of their findings, revise their understanding of the market opportunities, and iteratively revise their search process as they work toward a viable product. To date, however, little research in entrepreneurship education has explored mentor practices

and how those practices support student learning.

To address that gap, this paper presents the findings from a case study of a semester-long entrepreneurship course at a large mid-Atlantic university. By triangulating data from classroom observations, mentor interviews, and student interviews, we have developed a preliminary description of salient mentoring practices in this environment.

Literature Review and Theoretical Frameworks

Although detailed work on entrepreneurship mentoring in educational contexts is scarce, mentoring is a familiar strategy in developing and supporting entrepreneurs. Sullivan points out that learning emerges from three core sources: "past experience..., learning from 'colleagues'... and self-learning..." (2000, 163). Mentoring relationships can address all three as they offer students vicarious past experiences, serve as colleagues, and provide guidance for reflecting on personal experiences. Mentoring has also been shown to support cognitive and affective learning through knowledge transfer, competency development, and other developmental areas such as "self image, self-efficacy, and resilience" (St-Jean and Audet 2012, 136).

While there are useful frameworks for understanding mentoring in professional contexts (e.g., St-Jean and Audet 2012), no work to date appears to extend it to educational environments. For the present study, then, we turn to two closely related frameworks: mentoring practices in capstone design education developed by Pembridge (2011; Pembridge and Paretti 2011) and problem-based learning (PBL) facilitation practices identified by Hmelo-Silver and Barrows (2006). Together these frameworks provide a useful lens for understanding what mentors do as they interact with students. Importantly, the two frameworks operate at different levels: Pembridge's model describes functions and practices that operate at a macro level across a course to support students' career and psychosocial development, while Hmelo-Silver and Barrows' model provides a micro-level method for describing what facilitators say and do in the course of individual coaching sessions with PBL teams.

Capstone Design Mentoring

Pembridge's (2011) model of mentoring in capstone design courses, developed from reflective interviews with faculty, provides a useful lens to explore the practices at work in entrepreneurship education. Capstone courses, like most Lean LaunchPad experiences, focus on student teams undertaking open-ended, real-world projects. Both settings are designed to synthesize students' prior knowledge in a major design experience and prepare students for professional practice (e.g., the pragmatics of client needs, constraints, and specifications).

Based on Kram's (1985) model of mentoring in business settings, Pembridge's work, shown in Table 2, operationalizes those practices for capstone design environments, redefining the major functions and identifying context-specific practices.

	FUNCTION	OPERATIONAL DEFINITION
CAREER DEVELOPMENT	Employability/ Sponsorship	Provide students with access, opportunities, and materials that will assist them in attaining employment.
	Exposure/Visibility	Provide students with diverse opportunities to exhibit their skills and knowledge to facilitate acclaim and feedback and enculturate students in engineering practice.
	Coaching	Impart knowledge pertaining to technical engineering and professional skills through a variety of pedagogical approaches.
	Protection	Prevent student from failing to learn, failing projects, and poor relationships with clients through administration and execution of the course.
	Challenging Assignments	Develop students' technical and professional skills by providing them with complex, realistic projects.
PSYCHOSOCIAL DEVELOPMENT	Role-Modeling	Develop the positive attitudes, values, and behaviors of the field through interactions with the students.
	Acceptance/ Confirmation	Aid in the development of a student's self-efficacy and identity as a practicing engineer.
	Counseling	Guide teams and students through difficult interpersonal and personal problems
	Rapport	Develop interpersonal relationships with students that establish an environment in which they feel comfortable approaching the faculty.

Table 2. Capstone Design Mentoring Functions. Source: (Pembridge 2011)

These functions address distinct dimensions of student development: career and psychosocial. Career development functions focus on the skills and networks needed for students to be effective in their work. Mentors share discipline-specific knowledge and facilitate interactions with other professionals in the field. At the same time, mentors also seek to protect students from failures, including both project failures and failures to learn. Psychosocial development functions, in contrast, focus on personal development and address beliefs and attitudes, with an emphasis on the relationship between mentor and student. Mentors model their own behaviors and values, help students develop confidence in their work, provide strategies for negotiating personal and interpersonal challenges, and create a sense of approachability and comfort. By providing emotional support and encouragement throughout a project, mentors develop students' confidence and promote a sense of accomplishment about the work they are doing.

Facilitation Practices in Problem-Based Learning

While Pembridge's model addresses the macro level, the Hmelo-Silver and Barrows (2006) model of facilitation practices in problem-based learning (PBL) environments provides a useful lens for analyzing mentoring behaviors as they occur in dialogue between mentors and students. Like entrepreneurial ventures, PBL involves students solving ill-structured, authentic problems under realistic conditions and constraints, with the guidance of a mentor. Students are responsible for identifying what they know about the problem, what they need to know, and how they are going to learn about it. Problem-based learning is particularly relevant to entrepreneurship education because, as a pedagogical approach, it addresses broader transferable skills associated with solving ill-structured problems, including self-directed learning, collaboration, and a flexible knowledge-base (Hmelo-Silver 2004), which are essential

for successful entrepreneurs. In PBL, the mentor keeps students on track and, more importantly, stimulates learning. Hmelo-Silver and Barrows (2006) identified ten core practices of PBL facilitators use, as listed in Table 3:

PBL FUNCTION	OPERATIONAL DEFINITION
Open-ended/metacognitive questioning	Help students identify what they know and what they need to know.
Pushing for explanation	Help students clarify both their reasoning and the gaps in their knowledge.
Revoicing	Restate students' ideas, but also to ensure that all voices on the team are heard; highlight ideas the team should pursue.
Summarizing	Make sure the entire team has the same understanding; support synthesis.
Generate/evaluate hypotheses	Help students focus and test their ideas.
Map between symptom and hypotheses	Push students to explain their causal reasoning; elaborate causal mechanisms.
Check consensus that the whiteboard [used to capture ideas] reflects discussion	Make sure the students keep track of important ideas and decisions.
Cleaning up the board	Help the team make decisions and move forward; maintain focus; evaluate ideas.
Creating learning issues	Help students see the limits of their knowledge and ideas as opportunities to learn.
Encourage construction of visual representation	Help students represent what they know.

Table 3. Facilitation Practices in Problem-Based Learning. Source: (Hmelo-Silver and Barrows 2006)

These practices reflect a more nuanced set of practices associated with the coaching function of Pembridge's model, and help identify what mentors say and do as they work with student entrepreneurs.

Methods

To explore mentoring practices in entrepreneurship education, this paper presents a case study (Yin 2014) of a semester-long course conducted at a large mid-Atlantic institution. The course was team-taught by four instructors, three of whom had startup experience. One was simultaneously working as a faculty member and startup co-founder; another had previous startup experience, but was currently working as a faculty member leading an interdisciplinary technology-focused research initiative; the third was serving as a regional leader in startup and economic development; and the fourth, despite having no formal startup experience, had experience using the Lean LaunchPad model and a strong foundation in learning theories and the entrepreneurship education literature. In addition, other experienced start-up mentors from the community moved in and out of the course and engaged with student teams.

The course moved between informal presentations, in which each team presented the week's findings to the class for review and feedback, and working sessions, in which the teams met individually with one of several mentors. Students were also encouraged to seek out additional mentors who could help them succeed; the instructors created multiple opportunities for

teams to meet new mentors, including two mandatory mentor mixers/socials and "start-up events" within the local community.

Data collection included observation of all class meetings, interviews with mentors, and interviews with students. All procedures were governed by Virginia Tech's Institutional Review Board (IRB# 13-077).

Participants

The course consisted of twenty-five students, the four instructor-mentors, and six additional mentors. Student participants ranged from undergraduate sophomores to doctoral students from various majors and departments. Because only one woman was enrolled in the class, participants are not identified by gender in the data analysis. Mentors brought varied entrepreneurial experience, which enabled them to effectively support student development.

Observations

Whole-class presentations and discussions, as well as conversations between individual teams and their mentors, were observed each week; data was collected via extensive field notes. The observation protocols were based on the mentoring and problem-based learning frameworks formed, but the fields notes attempted to capture as fully as possible all course events and discussions. Observations were conducted by two of the authors until agreement was reached on the content observed; all subsequent observations were conducted by the first author to ensure consistency in the data. The observer(s) would observe whole-class discussions as they happened, then move about the room and identify entrepreneurial teams that were engaged in discussions with class mentors. The observer(s) would transcribe the conversations between the students and mentors, capturing dialogue as well as gestures, body language, and setting. The observer became immersed in the course, creating an environment in which students felt comfortable to speak freely in the presence of the observer. This observation data provided the foundation for the development of interview protocols for both the students and mentors.

Interviews

Near the conclusion of the course, emails were sent to all students and mentors, inviting them to participate in interviews about their experience. Four students and three mentors were interviewed. All student participants were engineering students. One mentor was an engineering graduate student, one was an external mentor, and the third was an engineering faculty member. Individual semi-structured interviews were conducted with both students and mentors. The interview protocols were developed based on the mentoring and problem-based learning (PBL) frameworks as well as the in-class observations and analysis. Student interviews explored interactions with mentors, how those interactions affected learning and project work, and the extent to which the advice or knowledge participants gained from their mentors was perceived as useful for their careers. Mentor interviews focused on intended student learning goals and how those goals were accomplished within the context of the course. The use of semi-structured interviews provided common data surrounding the central themes of the protocol, but also allowed the interviewer to explore specific or unanticipated topics more deeply (Patton 2002; Yin 2014). All interviews were audio-recorded and transcribed verbatim.

Analysis

Data analysis consisted of *a priori* coding of all observation field notes and interview transcripts, using the codes listed in Tables 2 and 3. To ensure reliability across researchers, the initial round of coding was reviewed and discussed by the research team until consensus was reached regarding the

definitions of each code. Following consensus, two members of the research team coded the same subset of transcripts in order to achieve inter-coder agreement across both frameworks. The remaining data was then analyzed by the same two members of the research team.

Results

Across both sets of codes, six codes emerged as dominant based on the frequency with which they appeared across all three sources of data: 1) coaching, 2) pushing for explanation, 3) protection, 4) rapport, 5) acceptance and confirmation, and 6) role-modeling. The first three practices directly address student learning, as mentors seek strategies to help students develop the necessary skills to succeed. The next two, rapport and acceptance and confirmation, address relationship-building to create a mentor-student dynamic that supports learning. Role-modeling then bridges the two groups by both providing a concrete vision of what the students are seeking to learn and establishing the mentor's credibility in a way that enables students to learn from their experiences. The following sections describe each code in more detail, with illustrative examples from the data.

Coaching

Coaching, as defined in Table 2, is the process by which mentors help students develop specific technical and professional skills needed to address the project at hand. As described by Pembridge (2011), coaching can take a variety of forms, from direct instruction to questioning to directing students to resources. In this case, mentors regularly moved back and forth across these strategies, as suggested by the following exchange:

> Students: Do you have any suggestions? We really want to set this up on Mother's Day. We have been looking at renting a [device] but... Do you have any suggestions? Do we try and bring an investor on board?
>
> Mentor: You will get four different answers, because there is not a right answer.
>
> Students: Well, what do you think?
>
> Mentor: Well, you can do a lot of things. You can bring in family members, you can get an angel, like one of us that walk around. You know what else you guys could do? Could you Indiegogo this?
>
> Students: Well, they want you to be able to create a product.
>
> Mentor: The hell you're going to have to go through is the barrier that you are going to have. What I would do is to begin to explore those elements of IP... I would certainly do a provisional, it costs next to nothing.
>
> Students: With the provisional, would we need a lawyer?
>
> Mentor: You would have to ask [other mentor]. [Field Notes: 4/17/13]

Here, the students are asking for specific directions, but the mentor offers multiple suggestions to consider first before then modeling his own behavior ("what I would do..."). Such exchanges recur throughout the course, with mentors employing various strategies to help students explore possible directions and make strong decisions.

Pushing for Explanation

The process of "pushing for explanation" emerged in the data as a dominant strategy, with mentors routinely asking "Why?" or "How do you know that?" as students presented claims and ideas. The following conversation, captured from the observational field notes, illustrates this dynamic as the mentor pushes for explanation from a student who was struggling to understand customer discovery:

Student: Well, I would imagine...

Mentor: Well, that's the thing. I don't want you to imagine. I want you to find out these things... Now you have this guy's name, have you talked to him?

Student: No.

Mentor: Okay! You need to talk to him! I understand you want to focus on [a specific detail of the product] and yeah that makes sense, but what I want you to understand is how they [stakeholders] make decisions.

Student: They don't! They just get a shipment [of product]!

Mentor: How do they do it?

Student: First in, first out.

Mentor: How do you even know? How does this person say that...?

Student: I don't know, I haven't spoken with him.

Mentor: Go talk to this person. Don't try to sell, try to understand... What's important? Is it the quality of the [product] that he gets? Does he ever see it? If he has to manage the distribution, how does he do it? Is there a process where they go through and decide? What's the process? I can't imagine that there isn't a process... How does he make decisions about how much [product] to ask for?

Student: Well a lot of it is farming... I feel like his job is very similar.

Mentor: I don't want you to feel! I want you to ask! [Field Notes: 4/17/13]

Here, the mentor is asking questions that explore what the student knows, rather than what the student "imagines" or "feels," to expose gaps in the underlying rationale and knowledge base that the student has not fully considered.

This strategy may be particularly important in entrepreneurship education, because novice entrepreneurs often make claims that seem logical and are grounded in their own beliefs and experiences, but may not be supported by any empirical evidence. Novices "fall in love" with their idea and thus may fail to test that idea against the needs, interests, and experience of their intended market. In startup development, many variables affect the decisions and future directions of the project, and some of those variables can go unnoticed if the right questions are not posed. By pushing for explanation, mentors highlight the need to explore additional factors needed to make effective entrepreneurial decisions and help students bridge the gap between what they know and what they need to learn.

Protection

The final practice linked directly to student development, and particularly important in classroom settings, is protection. While protecting novice entrepreneurs from project failures is likely common across both professional and workplace settings, the focus on learning may be unique to education because course mentors are focused on the student, rather than product development. To afford such protections, mentors monitor team progress, supply resources, ensure accountability, and make themselves available. The excerpt below from a mentor interview illuminates the ways in which understanding and intervening in the team dynamics was clearly linked to averting a foreseeable failure:

> There was another example where communication, hands down, was pretty much nonexistent, right?... I also was not confident that one of the team members, that anything this person told me was truthful or really was acted on at all.

> So when I interacted in that scenario, it was very much from a evaluate, filter, explore, what's, what portion of what this person is telling me is legitimate and what portion do I really need to press on and say, hold on, 'are-you-really-doing-that-or-are-you-just-telling-me-you're-doing-that-because-you-don't-want-to-tell-me-that-you-haven't-done-that' kind of a situation? [Mentor 1 Interview]

The mentor here was clearly attentive to the team dynamics, holding individual team members accountable for being honest about the situation. The mentor could sense that something was going wrong, and by checking in early and often, the mentor helped the team take corrective action and avert the failure.

Rapport

As noted earlier, rapports support learning indirectly by creating a climate in which students are willing and able to learn from their mentors. Mentors in the case study consistently worked to create an environment where students became comfortable approaching them. This "rapport" emerged from interactions inside and outside of the classroom through conversations, jokes, advice, and opportunities for mentors to get to know students personally. One mentor described the process as follows:

> As a career shift, I shifted into small businesses in my 30s and never looked back. And I'm glad I did. And with that, you do develop good personal relationships, and you get some of that same buzz in this course as a mentor. So absolutely, and in fact, I had a couple of students come to my house… That told me that people saw value in me as a mentor, and the folks that came to me, when they talked about their ideas, which were separate from what they were doing in class, the energy, the passion, the speed of thought was there." [Mentor 2 Interview]

Here the mentor talks about building personal relationships with students in the same way he would in a workplace. He had become someone that the students could approach for advice in a more relaxed setting. Student interviews consistently highlighted the effectiveness of such strategies:

> …he's one of those people I could talk to. He was very open to talking about things. And that I think comes from, you know, possibly his younger age, you know, he's engaging, and he tends to be a pretty positive person. But I feel like he's a little bit more real. [Student 2 Interview]

As the quote demonstrates, students felt very comfortable talking with a particular mentor, citing openness and authenticity as important aspects of their relationship.

Acceptance and Confirmation

Where rapport serves to ensure that mentors are approachable and available to students, acceptance and confirmation serve to provide students with "a sense of accomplishment" while also encouraging "personal ownership and responsibility" (Pembridge 2011) for both their learning and entrepreneurial projects. Most often, acceptance and confirmation took the form of mentors highlighting exceptional work by students and showing genuine interest in the projects. This acceptance and confirmation gave them the motivation needed to persist with their projects despite setbacks. Often in entrepreneurial endeavors, work can become exhausting and students may question their commitment to move forward in their projects, but as one student explained, the interest and excitement from the mentors provided an important support in the face of those difficulties:

> [The mentor's] excited about the idea and that's helpful, when you're excited about the idea, too, but after, [working on the project development] for four

and a half hours and you're exhausted, you're [chuckles], it's good to remember other people are excited about the idea, too. [Student 3 Interview]

Successful entrepreneurship can often involve long hours and a lot of sacrifice, and students benefit from feeling like they are accomplishing meaningful goals throughout the process. When the projects become overwhelming and team progress seems to slow, validation from mentors becomes a powerful way to keep students engaged and on track.

Role-Modeling

Role-modeling operates in a liminal space between direct and indirect learning support to impact the ways students make decisions inside and outside the classroom. Role-modeling includes both modeling professional behaviors and approaches to entrepreneurship, and expressing personal and professional values more broadly. Mentors frequently provided examples from their own experiences to help students understand the process of starting companies. In addition, mentors typically provide the rationale for their decisions to help students understand not just the mechanics of what to do, but why certain responses are appropriate and what factors might affect those responses.

Students in the case study clearly identified this role modeling as valuable, as illustrated by a student who was having trouble with teammates showing up late for meetings or missing them altogether:

> ...he [Mentor 2] recommended that I go by the process, when you take these actions, it makes me feel like you are disrespecting my time, it makes me feel, and just, so I could fill in the blanks, in terms of just explaining how the action makes me feel instead of accusing anybody of being lazy or, you know, instead of doing any labeling, just kind of much more pegging it from cause and effect of the action and the result, the resulted effect... So that was really helpful.
>
> And you know, he also shared some of his personal experiences, like when he gets in arguments with his wife, how he has learned through that interaction how to kind of argue better with better outcomes, and he was sharing that with me, so it was nice that he had that personal experience. [Student 2 Interview]

Notably, the student first describes the mentor providing direct coaching, but then describes the ways in which this coaching was followed by role-modeling based on the mentor's personal life. The personal experience served two goals: it supported rapport and it provided credibility. Because the advice was followed by an example from personal experiences, the student perceived that advice as more genuine and realistic.

Discussion and Conclusions

Analysis of the case study data using existing frameworks for working with student teams highlighted six practices that are salient for entrepreneurship education, particularly within the context of a course using the Lean LaunchPad curriculum:

- **Coaching**, broadly defined to encompass the multiple ways in which educators direct and guide students' project work.
- **Pushing for explanation** as a specific verbal strategy designed to encourage students to ground their decisions in empirical evidence, present a clear chain of reasoning, and identify gaps in their knowledge that need to be filled via continued search and exploration strategies.
- **Protection** not only from project failures, but from failures to learn the kinds of skills, behaviors, and attitudes that can transfer beyond the immediate course project to

subsequent entrepreneurship endeavors.

- **Rapport** to create a climate in which students feel comfortable approaching mentors to ask for advice and direction.
- **Acceptance and confirmation** to provide encouragement as students navigate the inevitable setbacks and direction changes that accompany the customer discovery process.
- **Role-modeling** to help students envision the practices they are learning in action via their mentors' own practices and to help develop the mentors' credibility based on past experiences of both success and failure.

As the data indicates, these practices occur almost simultaneously as mentors move from coaching students through a process to sharing their own experiences using the process, from protecting students from project failure to providing support and encouragement for their current direction, from joking to create an easy rapport to pushing students hard to explain their decisions.

While "coaching" offers the broadest description of what mentors do as they guide student teams through a process like Lean LaunchPad, the more specific practices for both direct instruction and indirect relationship-building are equally, if not more, important in creating an educational climate in which students are able to learn successfully. As the mentoring models developed by Kram, Pembridge, St-Jean, and others suggest, these interpersonal dynamics are critical; entrepreneurship education, like most project-based teaching and learning, is not solely a matter of experts transmitting effective practices to students. Instead, those experts develop meaningful relationships with students that support an array of both personal and professional learning goals. As entrepreneurship education in the US continues to expand, program developers need to ensure that mentors understand the full range of responsibilities and have the necessary tools and strategies to fulfill them. Future work will look to define learning outcomes and identify how these mentoring practices impact student learning in entrepreneurship classroom environments.

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References

Besterfield-Sacre, M., N. O. Ozaltin, A. Shartrand, L. J. Shuman, and P. Weilerstein. 2011. "Understanding the Technical Entrepreneurship Landscape in Engineering Education." Paper presented at the American Society of Engineering Education Annual Conference & Exposition, Vancouver, BC, Canada.

Blank, S. 2013. The Four Steps to the Epiphany: Successful Strategies for Products that Win. 2d ed. K&S Ranch.

Blank, S. May 2013. "Why the Lean Start-up Changes Everything." Harvard Business Review.

Blank, S., and B. Dorf. 2012. The Startup Owner's Manual: The Step-by-Step Guide for Building a Great Company. Vol. 1. Pescadero, CA: K&S Ranch, Inc.

Hmelo-Silver, C. E. 2004. "Problem-Based Learning: What and How Do Students Learn?" Educational Psychology Review 16(3):235-266.

Hmelo-Silver, C. E., and H. Barrows. 2006. "Goals and Strategies of a Problem-based Learning Facilitator." Interdisciplinary Journal of Problem-based Learning 1(1):23-39.

Kram, J. P. 1985. Mentoring at Work: Developmental Relationships in Organizational Life. Glenview, IL: Scott, Foresman, and Company.

Patton, M. Q. 2002. Qualitative Research & Evaluation Methods. 3rd ed. Thousand Oaks: Sage Publications.

Pembridge, J. J. 2011. "Mentoring in Engineering Capstone Design Courses: Beliefs and Practices across Disciplines." Ph.D. Doctoral Dissertation, Engineering Education, Virginia Polytechnic Institute and State University, Virginia Tech.

Pembridge, J. J., and M. C. Paretti. 2011. "An Examination of Mentoring Functions in the Capstone Course." Presented at the American Society in Engineering Education Annual Conference & Exhibition, Vancouver, BC, Canada, June 26-29.

Shartrand, A., P. Weilerstein, M. Besterfield-Sacre, and K. Golding. 2010. "Technology Entrepreneurship Programs in U.S. Engineering Schools: An Analysis of Programs at the Undergradute Level." Presented at the American Society of Engineering Education Annual Conference & Exposition, Louisville, KY.

St-Jean, E., and J. Audet. 2012. "The Role of Mentoring in the Learning Development of the Novice Entrepreneur." International Entrepreneurship and Management Journal 8(1):119-140.

Sullivan, R. 2000. "Entrepreneurial Learning and Mentoring." International Journal of Entrepreneurial Behavior & Research 6(3):160-175.

Yin, R. K. 2014. Case Study Research: Design and Methods. 5th ed. Thousand Oaks: Sage Publications.