

## Breaking up I/E: Consciously Uncoupling Innovation and Entrepreneurship to Improve Undergraduate Learning

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### Abstract

*When it comes to undergraduate education, the terms “innovation” and “entrepreneurship” are often used interchangeably with respect to curricular practices and their associated learning and developmental outcomes.*

*In this paper, we chart a course through the vast and growing multidisciplinary literature that governs both topics to argue that, not only are innovation and entrepreneurship different concepts, but they play out in institutional contexts in different and important ways.*

*Based on these differences, we propose that developing innovators must precede teaching future entrepreneurs. To illustrate the concept, we point to an existing program where professors and students from different disciplines work together on actual problems provided by clients from both the public and private sectors.*

*Finally, we propose a research agenda that would allow for a deep analysis of the interaction between organizational behaviors and student outcomes, providing insight into effective practices and strategies for mobilizing institutional efforts aimed at teaching innovation.*

### 1. Introduction

Based on a literature search, nearly 85,000 articles and books have been published on innovation and entrepreneurship since 2014. The terms, whether spelled out or contracted to I/E, are generally referenced as equivalent terms, synonyms, or if differentiated, still fundamentally connected. However, it is clear from several definitions that these two concepts are not the same [1][2][3]. Though many definitions exist, an innovator may broadly be defined as someone who introduces changes or new ideas—characteristics that

are also associated with leadership [4]. An entrepreneur, by contrast, is defined as one who organizes, manages, and assumes the risk of a business or enterprise [3]—words that correlate more closely with Bennis’ concept of the manager [5].

One primary location where the two terms can become problematically conflated is in undergraduate education. As is evidenced by the historical rise of entrepreneurship programs [6] and the recent proliferation of innovation centers [7], curricula and associated spaces directed at promoting, creating, and delivering on new ideas have become an increasingly widespread and commonplace feature of the modern college environment. A quick scan of program descriptions from higher education promotional materials and websites indicates just how intertwined these concepts have become on college campuses. One such description cites, “The Entrepreneurship and Innovation Program (EIP) provides [institution’s name removed] Honors College freshmen and sophomores with an interdisciplinary, living and learning education to help build the entrepreneurial mindsets, skill sets, and relationships invaluable to developing innovative, impactful solutions to today’s problems.” Their mission statement, “to foster an entrepreneurial spirit, create a sense of community and cooperation and develop ethical and innovative leaders” further conflates the two concepts in a way that may create more confusion than clarity. Such ambiguity also leads to practical challenges: Who among the faculty is qualified to foster entrepreneurial spirit? Where do such curricula live? Who should pay for materials and other artifacts associated with such courses? How are such courses to be meaningfully assessed in accordance with accreditation and discipline-specific standards? How will stakeholders know if such outcomes are being achieved?

Drawing on a multidisciplinary theoretical framework and a bona fide example of an innovation-specific program, the purpose of this paper is to advance

the idea that innovation and entrepreneurship should be carefully distinguished when such ideas are incorporated into the undergraduate college curriculum. We further suggest that developing innovators must inherently *precede* producing entrepreneurs; consciously uncoupling these two ideas and uncovering the progression from one to the other ideally can work to the benefit of both.

## 2. Theoretical framework

To provide a framework that supports our argument, we first outline theoretical approaches to studying and understanding innovation and entrepreneurship. In doing so, we hope to demonstrate that methods of understanding and teaching innovation and entrepreneurship have shifted over time.

### 2.1. Entrepreneurship

Schumpeter (1936) and Kirzner (1999), two pillars of entrepreneurial research, advance grand theoretical approaches based on economic theory. Schumpeter generally describes the entrepreneur as the source of economic disruption, a creative process that replaces the destruction of what is with a more efficient model. Schumpeter's entrepreneur benefits by creating arbitrage situations and profiting from the new model. Schumpeter sees this as a defining characteristic of the capitalist system [8].

Rather than necessarily creating arbitrage situations through disruption, Kirzner's [8] entrepreneur finds those opportunities and exploits them by means, timing, or processes that others have not. Kirzner's entrepreneur finds arbitrage opportunities and restores the market's equilibrium. The subtle difference between Kirzner's more passive model and Schumpeter's disruptive model hinges on the source of the entrepreneurial idea and the foundational principle that entrepreneurs prosper from their ability to deal with risk and uncertainty. The difference may hold significance from an economic theory perspective, but neither model serves to adequately address the more compelling question for many universities, "How do we grow entrepreneurs?" Or, given the proliferation of entrepreneurship centers over the past 30 years, more appropriate questions might be, "Is there a difference between innovators and entrepreneurs?" and "Is creating an entrepreneurship center the most effective means of growing entrepreneurs in higher education?"

Schultz [9], offers a third approach to understanding entrepreneurship based on human capital. Schultz's definition of an entrepreneur shifts the focus away from financial risk and uncertainty and instead

centers on the ability to deal with disequilibria. By basing his model on human capital, Schultz opens the entrepreneurial door to contributions from behavioral science and leadership. His broad definition of disequilibrium goes beyond financial reward and market activity, with applications in nearly every aspect of human life. In his model, laborers act entrepreneurially in their daily lives when they make dynamic decisions to change jobs in response to new opportunities. According to Hebert and Link [10], Schultz argues that his disequilibrium model may make more sense than those based on risk because there is not an exclusive relationship between risk and entrepreneurial activity.

The strong relationship between entrepreneurship and management is not just linguistic or theoretical, it is manifest in higher education practices. Based on a survey of 94 higher education centers for entrepreneurship, Finkle, Kuratko, and Goldsby [11], found that 100 percent were located within the institution's college of business. Within that group, 17 percent were located exclusively in the management department, 25 percent were mixed between management and marketing, and 23 percent were independent units within the college of business.

It seems reasonable then to conclude, as many entrepreneurship researchers and higher education organizations have, that entrepreneurship is closely related to management.

### 2.2. Innovation

While entrepreneurship and the entrepreneur have something of a leading role in higher education, the literature is less well developed on the role of innovations and the innovator [12][13]. According to Van De Ven [14], innovation is the development and implementation of new ideas by people who, over time, engage in transactions with others within an institutional order. An innovation is a new idea, process, or method or there is a perception of newness by those involved, such that it challenges the status quo.

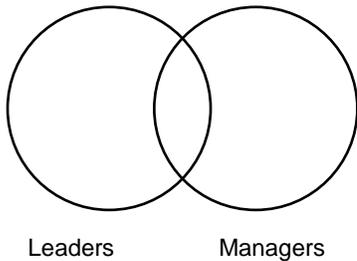
The theory of disruptive innovation first appeared in literature in a 1995 article by Clayton Christensen that appeared in the Harvard Business Review [15]. Often overlooked, the core tenet of Christensen's disruptive innovation model is that true disruptions originate in either low-end or new-market footholds. A small team with few resources can beat established companies by providing a product that is significantly lower in cost and offers sufficient quality or features to satisfy the low-end market. Disruptive innovators also create markets where customers might not have even realized they needed a solution.

Taking this model into consideration, the initial distinction between innovators and entrepreneurs begins

to emerge and invites us to ask, “How do we operationalize these models in the context of undergraduate education?” To consider this question, we turn to an applied framework: innovators as leaders and entrepreneurs as managers.

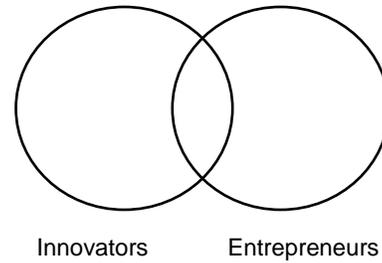
### 3. Innovators as leaders, entrepreneurs as managers

In seeking to apply theoretical differences, we suggest that if Bennis’ [5] portrayal of leadership characteristics similarly correlate to innovators, then the situation posed by Hughes, Ginnett and Curphy [16] (see Figure 1), could reasonably apply to entrepreneurs and innovators as well. Supported by Hughes et al. [16], the difference in this manner provides two primary benefits. First, it allows us to situate our distinction within the context of pre-existing distinctions—that between leader and manager—which has a far more robust and demonstrated trajectory in the literature [4]. Second, this framework might help us to better position teachable skills between innovators and entrepreneurs, providing innovators with skills that pertain specifically to them.



**Figure 1. Leadership and management overlap**

Expanding on these differences, Zaleznik [17], provides multiple examples of this distinction between the leader-innovator and the manager. His conclusion is that business schools and many industrial organizations have conflated leadership and management for so long that they no longer see the distinction between leaders and managers. Adopting this description helps to explain why “innovator” and “entrepreneur” are also seen as equivalent terms despite the evidence that these practices often rely on differing skills and abilities. Important in this distinction is that neither is better, nor more important than the other [16]; both are critical to the success of any venture, yet they are distinct (see Figure 2).

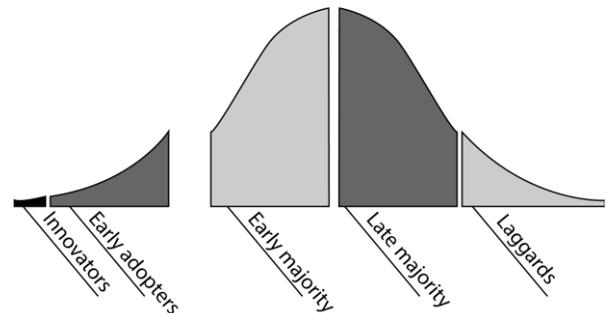


**Figure 2. Innovators and entrepreneurs, adapted from Hughes et al. (2015)**

#### 3.1. Locating the chasm

Distinguishing innovators from entrepreneurs and developing appropriately differentiated pedagogy is a needed response to the aforementioned conclusions [18][19]. How might we locate such pedagogy with this better understanding of distinctive interplay between innovation and entrepreneurship? In his book *Crossing the Chasm*, Moore [20] presents a compelling discussion covering both higher education’s attraction to entrepreneurship as well as its challenges. While the book focuses primarily on the marketing requirements of high technology and entrepreneurial ventures, Moore’s description of the adoption lifecycle is helpful in understanding the appeal of entrepreneurship centers on college campuses.

By distinguishing between innovators/early adopters and the majority of people in the potential market, Moore identifies a flaw in the current academic model of entrepreneurship—what he describes as the “chasm of adoption.” While innovators and early adopters seek out new technology aggressively, the majority tend to wait until the technology—and the companies selling the technology—are more established [20]. Moore identifies the gap between the early adopters and the majority as the adoption chasm.



**Figure 3. Moore’s revised technology adoption life cycle model**

Though it remains possible that would-be undergraduate student-entrepreneurs might generate disruptive solutions that could be adopted by the early majority, this is atypical. Lacking industry experience, undergraduate student-entrepreneurs are far more likely to draw on their experiences as consumers and thus more likely to generate entrepreneurial ideas in those domains (e.g., food, parking, time management, music, and social engagement) [21]. Exacerbating the innovation challenge, students are often able to get positive feedback or indicators of traction from their social networks and friends that give them false indications of market potential for a valueless product.

Framed against Moore's [20] model, then, we believe education exclusively in service of entrepreneurship education perhaps starts on the incorrect side of the chasm. Whereas entrepreneurship education focuses on the process, products (and persons) entering the market as part of the early majority, students may be better positioned—from a personal and career developmental perspective—to learn a process to identify worthy problems and innovative solutions with sufficient real market potential to bridge the chasm, solve real problems, and be adopted by the majority. This claim, based on our understanding of Moore, leads us to two others. First, we propose that innovation is a necessary precursor to successful entrepreneurial ventures. Learning to write a business plan without first developing an innovative product or process is much like building a sports car without an engine; it looks great on the outside, but lacks the power to actually go anywhere. Second, we argue that innovators are *made*, not *born* and further propose that innovation-specific courses and programming provide the pedagogical resources needed to develop undergraduate innovators.

### 3.2. Delivering skill-building pedagogies

Combining elements of Moore's chasm as they apply to postsecondary educational settings with recent work done by Selznick and colleagues [12][13][22] provides an investigation into the development of innovators.

With an exclusive focus on student innovation, Selznick et al. introduce a set of skills—termed innovation capacities—specifically designed to be developmentally appropriate for undergraduate students. While such curriculum includes specific courses (e.g., innovation and/or creativity related), they also include educational practices such as asking students to engage in assessments that require argumentation and problem solving; they also include opportunities to apply learning.

Certainly, innovation capacities are not wholly dissimilar from those associated with formal approaches to entrepreneurship education [23][24]. However, notable differences reflect important distinctions between leaders and managers, as well as essential emphases on the innovation/early adopter side of Moore's [20] chasm, as opposed to those needed in the early majority and beyond. While we do not and cannot provide an exhaustive list of differences, allow us to present a few.

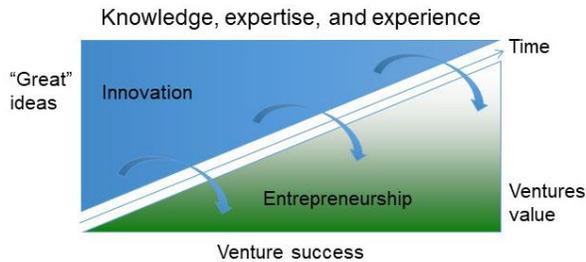
First, a key skill in the entrepreneurship curriculum is learning how to write a business plan. A key skill in the innovation curriculum, however, is gaining perhaps more fundamental skills of persuasive communication, teamwork across forms of difference, and networking. Second, whereas creative ideation and risk-taking *can* be a feature of entrepreneurship programs, these are *necessary* features of innovation curriculum. Third, we believe innovation curriculum can be explicitly designed to develop students in the intrapersonal dimension, helping to improve their intrinsic motivation, their desire to be proactive, and their self-concept as innovators.

Given these skill-based differences, Selznick et al. further suggest that innovation—which they define as the process of generating and executing contextually beneficial new ideas—can be far more expansive in its audience and application, opening the door to a greatly expanded set of students, ideas, and possible social benefits stemming from such ideas. As the authors argue:

“It is important, if not imperative, for those concerned with promoting a collegiate innovation agenda to expand innovation to mean more than being a tech-savvy product developer; to extend the curricular reach of innovation courses beyond their traditional disciplinary homes (e.g., business, engineering); and above all to inspire students to create and enact the ideas that will benefit the many challenging contexts facing modern societies, ecologies, and democracies” [22].

Avoiding the considerations and insights presented by behavioral science, leadership and education research might allow for the discussion of a purely economic-based entrepreneurial theory, but it offers little assistance as a guide in developing innovators and entrepreneurs. Nor does it support larger goals of generating significant economic impact from new ventures created in conjunction with higher education institutions. Combining across theoretical and empirical perspectives, however, we can propose that significant practical benefits are likely to be achieved by understanding that—at least with respect to undergraduate education—innovation and entrepreneurship can be decoupled to the benefit of both. Figure 4 provides a graphical representation of the

conceptual change we are suggesting—a model in which innovation begets entrepreneurship and developing innovators necessarily *precedes* developing entrepreneurs.



**Figure 4. Proposed model representing the relationship between innovators and entrepreneurs**

This model depicts the argument that value and effectiveness increase when innovation precedes entrepreneurship. Innovation and entrepreneurship are concepts that can be taught and both tend to improve as knowledge, experience and expertise increase. Over time, the innovator takes on and solves more challenging problems. Those solutions have greater value and lead to ventures with greater value and a higher probability of success. Given how often innovation and entrepreneurship become conflated, however, what does a program focused on developing capacities of innovation look like? As the following sketch demonstrates, JMU X-Labs, a multidisciplinary academic program housed at James Madison University, is a rich example of a small, teaching-focused unit embedded within a larger, public, undergraduate-focused institution that manages to cross curricular boundaries and produces student learning outcomes that fit well with the innovation capacities outlined above.

#### 4. Innovation education in practice: A sketch of JMU X-Labs

JMU X-Labs is housed under the office of the provost rather than within a single academic department, college, or school, and it is financed by a state fund to promote innovation and collaboration across a number of universities. JMU X-Labs comprises two primary spaces. The first is an academic makerspace, which serves as an educational laboratory equipped with teleconferencing capabilities, fabrication equipment, such as laser cutters and 3D printers, and digital technologies dedicated to instruction [25], including the computing hardware and software to support rendering of 3D modeling and augmented and virtual reality applications. The second is a classroom

with fixed seating, which is also equipped with teleconferencing capabilities. JMU X-Labs is managed by a team of six administrative and technical staff who work for the organization in a part-time capacity and who handle the considerable logistics of managing the space and researching and maintaining the various technologies the lab supports.

A brief description of an actual course will demonstrate how JMU X-Labs facilitates the development of the student innovation capacities described by Selznick, Mayhew, and others above. The Unmanned Systems for Virginia (US4VA) course ran in the Spring 2018 semester and focused on designing uses for unmanned systems such as aerial and underwater drone technology for ecological research. The course was team-taught by faculty from biology, industrial design, physics, and writing studies, as well as an inventor and entrepreneur with experience in the UAV/UAS industry. The course also partnered with an aeronautical engineering professor and his students in a concurrently taught engineering course at Old Dominion University. Both of the non-JMU collaborators regularly used teleconferencing technology to participate in the class.

The focus of the course was to develop applications of unmanned aerial systems to serve ecological research. Clients for the course included the Smithsonian Conservation Biology Institute and the Virginia Department of Game and Inland Fisheries, among others. Projects that student teams worked on included tracking invasive plants using a drone equipped with specialized infrared camera equipment, designing a drone that can remotely and safely dart large moving animals with medicines, and using photogrammetry techniques to map oyster reefs to better understand how to fabricate those reefs to save the rapidly declining oyster population in the Chesapeake Bay region of Virginia.

Each team included a combination of students from the disciplines represented by the faculty team, which provided students with in-depth experience working with others across different disciplines, a key capacity of innovation [12]. This was made possible by relatively unusual yet highly effective wrangling of the university’s course enrollment system. Each member of the teaching team used a course listing within their department’s major to enroll a small number of students (<12). As a result, US4VA was not a single course but a network of class sections that met concurrently in the same space, and that shared a common syllabus. (This method of creating courses is standard practice at JMU X-Labs; see McCarthy et al. [26] for a more extended analysis of how JMU X-Labs courses are designed.)

Other capacities for innovation proposed by Selznick and Mayhew can be observed in structural

elements of the course. Teams worked exclusively with a client or problem sponsor during the semester, tackling actual pain points of the organization—a “real world” applicability that increased students’ intrinsic motivation. Following methodologies such as the “Lean Launchpad,” students were encouraged to get out of the classroom to test concepts, and connect with industry and academic experts to improve their research and prototype designs.

As a basis for instruction, faculty used design thinking to guide the students’ inquiry. Design thinking is a problem-finding and problem-solving method that occurs as an iterative process through the following actions: empathize, define, ideate, prototype, and test [29]. This methodology bolstered student creativity and tolerance for risk-taking, allowing them to move beyond predictable and inefficient solutions, and to explore the problem space more deeply and effectively.

Significant focus on persuasive communication—another capacity of innovation—enabled students to generate and execute contextually beneficial new ideas for their clients. Faculty taught students how to handle different ways of thinking and doing among the cross-disciplinary teams. Further, each student team was asked to communicate their research process and outcomes to a variety of audiences, such as their clients, the faculty team, and the general public. Students gave regular in-class presentations and participated in a final showcase open to the public. In addition, each team provided a full account of their project and process on a course website that was designed and produced by the students and faculty ([sites.lib.jmu.edu/us4va](http://sites.lib.jmu.edu/us4va)).

## **5. Positioning innovation and entrepreneurship in the university: Implications for practice**

As the above sketch indicates, JMU X-Labs produced innovation-based education experiences for undergraduates combining focused pedagogical methods, university support systems, and a constantly evolving network of students, faculty, industry collaborators, clients, and problem sponsors. How are these results to be achieved, especially in other large and often diffuse postsecondary educational settings? Certainly, changes must take place. As postsecondary scholars Berger and Milem [30] note, a systems approach is likely to yield the greatest opportunity for both meaningful and sustainable change. Our work began with a focus on changing the student experience—the central component of the higher education model—and discovered that changing the student experience led to changes in student outcomes. Implementation and institutional sustainability required

organizational changes in both structure and behaviors. Organizational adaptations are the subject of ongoing transformations and will require further research and explanation as the process unfolds. Our initial anecdotal observations of changes in student outcomes have sparked a more formal line of research into identifying and quantifying those changes and differentiating those changes compared to the general student population.

Our experience over three years has informed our practice and research while simultaneously expanding our model into something that approaches the comprehensive system described by Berger and Milem [30]. Within the institution, we observed this through students recruiting their peers to participate in our courses. Further, student teams from different social and academic groups have formed peer groups that interact in formal and informal academic groups, but they also tend to form social groups that span well beyond their academic requirements. Berger and Milem suggest that student entry characteristics inform and influence peer group characteristics. Our experience differs from their model, observing that the relationships between student entry characteristics, peer group characteristics, and student experiences are bi-directional in nature. Further research is underway to understand and characterize those relationships.

This year, the dean of admissions asked that JMU X-Labs offer an open house experience to accepted freshmen and transfer students during our institution’s “CHOICES” day. The idea that unique student experiences might affect student entry characteristics directly is not reflected in the original Berger and Milem [30] model. A research program using social network theory is underway to characterize this relationship, as we have seen preliminary evidence of a direct, bi-directional link between student experience and student entry characteristics.

Changes in organizational behavior resulting from a critical review of entrepreneurial programs might include all aspects of the institutional model elements identified by Berger and Milem [30], such as bureaucratic, collegial, political, symbolic, and systemic. Implementing organizational changes with a simultaneous, coordinated research effort provides an outstanding opportunity to empirically test the Berger and Milem model for researching organizational impact on student outcomes.

If the Berger and Milem [30] model holds, the opportunity for institutions to modify the student experience to account for those different personality types may have a statistically significant impact on both student outcomes and the demographics of incoming students. Any measurable changes in either would offer practical significance. Likewise, such a deliberate change at the institutional level would indicate a tacit

belief that the Berger and Milem model is valid while offering another potential opportunity to study the change over time. Further, higher education institutions may realize significantly better student outcomes and economic impact by instituting programs that support and develop each of these distinct skills separately.

Establishing a distinction between these two concepts creates an opportunity for further research on related topics of institutional change. Berger and Milem describe dominant characteristics of students at a particular campus as the human aggregate [30]. Institutions seeking to change their rankings among peers—or the perception of their academic standing by current and future students—through broad institutional innovations as described by Clark [31], could evaluate changing their human aggregate. Do programs developed specifically to support innovators have an impact on recruiting and attracting different students? As Berger and Milem [30] suggest, might the changes in inputs have an impact on the student experience and student outcomes?

While distinguishing between innovation and entrepreneurship would represent change at the institutional level, the important unit of study is the individual student [30]. A relatively simple survey of prospective students and incoming first-year students would indicate changes in attitudes, awareness, and behaviors over time. With a unique benefit of coordinating the implementation of a new program with a robust research agenda, it would be possible to study nearly all of the participants in each program (innovation and entrepreneurship) as well as any overlapping students. With sufficient planning and resources, a longitudinal record of student experiences would allow for a deep analysis of those experiences and the interaction between organizational behavior and student outcomes as depicted by the Berger and Milem model [30].

In their implications for future research, Berger and Milem [30] describe the need for additional quantitative studies to test their model empirically and qualitative studies to develop rich descriptions of how the dimensions of organizational behavior are enacted [30]. In light of the opportunities posed by this project, we are undertaking a series of steps to further test our theory of a mixed methods approach that might blend the quantitative measures with the rich, qualitative descriptions needed to understand the nuanced connections (or disconnections) between postsecondary organizational behavior, impactful student experiences and contemporary student outcomes.

Finally, with respect to our own model (Figure 4), we introduce several opportunities for testing and considering validity. Taking a comparative perspective, we might consider comparing students who pursue an

innovation-specific course (e.g., JMU X-Labs) to those who take an entrepreneurship course during a semester, with appropriate controls in place (e.g., major, prior experience). If our model were to hold, we would expect students in the innovation-specific course to generate ideas with greater novelty and contextual benefit relative to students in the entrepreneurship class. We emphasize again that at the critical learning and developmental stages associated with undergraduate education, teaching students to create great ideas might hold far more benefit for students and societies than teaching students primarily how to convert recognized opportunities into monetary value. More comprehensively, extended (e.g., 6-10) year longitudinal data could allow us to chart the pathways of students on campuses with semi-structured innovation and entrepreneurship opportunities to see if our progression from great ideas to venture success follows our proposed model. Ideally, we would begin by collecting data at three time points—beginning of the first year, end of the first year, and end of the senior year—to test for the net effects of college and potentially discover the extent to which student pathways progress in accordance with our model. A follow-up collection in a subsequent time frame (e.g., 2-4 years post-graduation) could then allow us to tie collegiate development to post-graduation career, innovation, and entrepreneurship outcomes. Conducting such a study would allow us to answer some potentially big questions: Can entrepreneurs succeed without actually being innovative? Can innovators, alternatively, fully realize their transformative visions without at least some entrepreneurship knowledge? And what is the role of collegiate experiences in preparing the next generation of innovative entrepreneurs? The late, great Will Baumol thought deeply about these questions, which surely remain unanswered [1]. Given the expenses associated with collecting such data, we might also consider opportunities to study our model retrospectively by collecting data (e.g., survey and interview) from successful entrepreneurs to learn which aspects, courses, and experiences in their undergraduate years proved influential and useful to creating successful and valuable ventures.

## 6. Conclusion

Distinguishing innovation and entrepreneurship, we propose, holds numerous benefits. Certainly, theoretically nuancing these two terms and reflecting on their connections with existing conceptual differences between leadership and management can help us better consider and inform this dialogue as it exists throughout regional, national, and global economies. Yet, stepping

back a bit, we encourage readers to ask: Where do innovators and entrepreneurs come from? We believe that postsecondary education can be a primary driver; however, we have argued that the time has come to further consider conceptual differences, associated curriculum, and needed skills. Perhaps our boldest claim—that innovation precedes entrepreneurship—is the one that we hope educators take closest to heart. Here, we are not arguing that innovation and entrepreneurship have a messy divorce or even a trial separation. Rather, we believe a conscious uncoupling of these terms, which recognizes their inherent value to students and economies, can work toward better-developing innovators, successful ventures, and better realization of higher education in the 21<sup>st</sup> century.

It is on this last point that we direct additional thinking and consider not *what* we want our students to be but, instead, *how* we want them to be, and how educators ought to get them there. Deresiewicz [33], echoing complaints from many educators, has bemoaned that college students are entering and

graduating not as innovative problem-finders prepared for the global knowledge economy, but instead as the opposite—“excellent sheep” who are wholly unequipped with “the capacity to envision new alternatives for how to live” (p. 91). Is this what employers, states and nations want? The evidence suggests not. Instead, postsecondary stakeholders’ emphasis is increasingly on graduating leaders (vs. managers); forward thinkers (vs. laggards); those able to not simply say “think globally; act locally” but actually *do* this. While this paper does not, nor could not, take on the many woes of higher education in 2018, it does provide a set of conceptual avenues, engaged practices, and research ideas that we hope can not only reframe thinking, but motivate those wishing to *lead innovation through innovative leadership* in the postsecondary context with the arguments, resources, and tools to overcome laggard management in the spirit of catalyzing actual change.

## 7. References

- [1] W. J. Baumol, *The Microtheory of Innovative Entrepreneurship*, Princeton University Press, <https://play.google.com/store/books>, 2010.
- [2] M. J. Mayhew, J. S. Simonoff, W. J. Baumol, B. M. Wiesenfeld and M. W. Klein, “Exploring innovative entrepreneurship and its ties to higher educational experiences”, *Research in Higher Education*, 2012, 53, pp. 831-859.
- [3] R. Sobel, “Entrepreneur”, *The Concise Encyclopedia of Economics*, <http://econlib.org/library/Enc/Entrepreneurship.html>, 2008.
- [4] P. G. Northouse, *Leadership: Theory and Practice* (7<sup>th</sup> Ed.). London: Sage, 2016.
- [5] W. Bennis, *On Becoming a Leader: The Leadership Classic*, Basic Books, <https://ebookcentral.proquest.com>, 2009.
- [6] J. A. Katz, “The chronology and intellectual trajectory of American entrepreneurship education: 1876-1999”, *Journal of Business Venturing*, [https://doi.org/10.1016/S0883-9026\(02\)00098-8](https://doi.org/10.1016/S0883-9026(02)00098-8), 2003, 18, pp. 283-300.
- [7] J. Wyllie, “Colleges Have Spent Big Money on Innovation Centers. Do They Work?”, *The Chronicle of Higher Education*, <https://www.chronicle.com/article/Colleges-Have-Spent-Big-Money/242992>, March 30, 2018.
- [8] I. Kirzner, “Creativity and/or Alertness: A Reconsideration of the Schumpeterian Entrepreneur”, *Review of Austrian Economics*, <https://doi.org/1007719905868>, 1999, 11, pp. 5-17.
- [9] T. Schultz, “Investment in Entrepreneurial Ability”, *The Scandinavian Journal of Economics*, <http://www.jstor.org/stable/3439676>, 1980, 82, pp. 437-448.
- [10] R. Herbert and A. Link, “In search of the meaning of entrepreneurship”, *Small Business Economics*, <https://doi.org/10.1007/BF00389915>, 1989, 1, pp. 39-49.
- [11] T. A. Finkle, D. F. Kuratko and M. G. Goldsby, “An Examination of Entrepreneurship Centers in the United States: A National Survey”, *Journal of Small Business Management*, <https://doi.org/10.1111/j.1540-627X.2006.00163.x>, 44, pp. 184-206, April 2006.
- [12] B. S. Selznick and M. J. Mayhew, “Measuring undergraduates’ innovation capacities”, *Research in Higher Education*, 2017.
- [13] B. S. Selznick, “Higher education for undergraduate innovation”, (Unpublished doctoral dissertation), New York University, New York, 2017.
- [14] A. Van De Ven, “Central Problems in the Management of Innovation”, *Management Science*, <https://doi.org/10.1287/mnsc.32.5.590>, 1986, pp. 590-607.
- [15] C. Christensen, M. Raynor, and R. McDonald, “What is Disruptive Innovation?” *Harvard Business Review* (reprint), <http://pedrotrillo.com/wp-content/uploads/2016/01/WhatIsDisruptiveInnovation.pdf>, December 2015, pp. 1-11.
- [16] R. L. Hughes, R. C. Ginnett and G. J. Curphy, *Leadership: Enhancing the Lessons of Experience* (8 ed.). New York: McGraw-Hill, 2015.

[17] A. Zaleznik, "The leadership gap", *Academy of Management Perspectives*, <https://doi.org/10.5465/AME.1990.4274698>, February 1990, 4, pp. 7-22.

D. F. Kuratko, "The Emergence of Entrepreneurship Education: Development, Trends, and Challenges", *Entrepreneurship: Theory and Practice*, <https://doi.org/10.1111/j.1540-6520.2005.00099.x>, Merriam-Webster Dictionary. (2018). In Dictionary. <https://www.merriam-webster.com/>, September 2005, 29, pp. 577-597.

[18] M. J. Mayhew, J. S. Simonoff, W. J. Baumol, B. Selznick and S. Vassallo, "Cultivating Innovative Entrepreneurs for the 21<sup>st</sup> Century: A Study of U.S. and German Students", *Journal of Higher Education*, 2016 87(3), pp. 420-455.

[19] T. Wagner, *Creating Innovators: The Making of Young People Who Will Change the World*, New York: Scribner, 2012.

[20] G. A. Moore, *Crossing the Chasm, 3rd Edition: Marketing and Selling Disruptive Products to Mainstream Customers*, HarperCollins Publishers, [https://www.barnesandnoble.com/w/crossing-the-chasm-3rd-edition-geoffrey-a-moore/1116092388?ean=9780062293008#](https://www.barnesandnoble.com/w/crossing-the-chasm-3rd-edition-geoffrey-a-moore/1116092388?ean=9780062293008#/), 2014.

[21] J. H. Friar and M. H. Meyer, "Entrepreneurship and Start-Ups in the Boston Region: Factors Differentiating High-Growth Ventures from Micro-Ventures", *Small Business Economics*, <https://link.springer.com/article/10.1023/A:1025045828202>, September 2003, 21, pp. 145-152.

[22] B. S. Selznick and M. J. Mayhew (in press), "Developing first-year students' innovation capacities", *Research in Higher Education*.

[23] M. H. Morris, J. W. Webb, J. Fu, and S. Singhal, "A Competency-Based Perspective on Entrepreneurship Education: Conceptual and Empirical Insights", *Journal of Small Business Management*, 2013.

[24] M. H. Morris and D. F. Kuratko, "Building University 21<sup>st</sup> Century Entrepreneurship Programs that Empower and Transform", Emerald Group Publishing Limited, 2014.

[25] P. Ludwig, J. Nagel and E. Lewis, 2017, "Student learning outcomes from a pilot medical innovations course with nursing, engineering, and biology undergraduate students", *International Journal of STEM Education*, 2017.

[26] S. McCarthy, A. Barnes, S. K. Holland, E. Lewis, P. Ludwig and N. Swayne, "Making It: Institutionalizing Collaborative Innovation in Public Higher Education", in press.

[27] H. W. Rittel and M. M. Webber, "Dilemmas in a general theory of planning", *Policy Sciences*, <https://doi.org/10.1007/BF01405730>, 1973, 4(2), pp. 155-169.

[28] S. Blank, "Why the Lean Start-Up Changes Everything", *Harvard Business Review*, <https://hbr.org/2013/05/why-the-lean-start-up-changes-everything>, 2013.

[29] The Stanford d.School, <https://dschool.stanford.edu/>

[30] J. B. Berger, and J. F. Milem, "Organizational behavior in higher education and student outcomes", *Higher Education: Handbook of Theory and Research*, J. C. Smart, & W. G. Tierney (Eds.), 2000, pp. 268-338.

[31] B. R. Clark, *The Distinctive College*, Transaction Publishers, New Brunswick, NJ, 1992.

[32] A. Kishbaugh, "An Exploratory Case Study of Cross-Disciplinary Project-Based (i.e., Maker) Curricula as a Catalyst for Entrepreneurship", in press.

[33] W. Deresiewicz, *Excellent sheep: The Miseducation of the American Elite and the Way to a Meaningful Life*, New York, NY: Free Press, 2014.