

INCREASING FACULTY ENGAGEMENT IN ENTREPRENEURIAL BEHAVIOR TO  
ADVANCE REGIONAL ECONOMIC DEVELOPMENT: AN INNOVATION STUDY

by

Allison C. Boxer

A Dissertation Presented to the  
FACULTY OF THE USC ROSSIER SCHOOL OF EDUCATION  
UNIVERSITY OF SOUTHERN CALIFORNIA  
In Partial Fulfillment of the  
Requirements for the Degree  
DOCTOR OF EDUCATION

August 2020

Copywrite 2020

Allison C. Boxer

## ACKNOWLEDGEMENTS

I want to acknowledge USC Rossier School of Education for supporting the development of this unique and innovative Global Doctor of Education program. Thank you to Dr. Mark Robison for your vision and tenacity to create such an inspiring program; I returned from every in-person session invigorated and renewed both personally and professionally. Dr. Sabrina Chong kept everything running smoothly, making the program a success. My Committee Chair, Dr. Tracy Poon Tambascia was a truly helpful and steady resource throughout the journey. Our check-ins kept me sane and prepared. Finally, thank you to Dr. Donde Plowman for opening the door to the opportunity to research the topic I joined this program to pursue in the first place. I hope this research will be helpful to you in some small way.

My path toward education was deeply influenced by two extraordinary individuals. First, my orientation to attend an equity-focused program that examines comparative global realities was grounded in the formative experience of studying in Tanzania with Dr. Kathy Thomforde. Our time in Iringa fundamentally shaped my passions and career path. And, Dr. David R. Anderson, who embraced my wild idea to take leave from my job and immerse myself in higher education administration. My month “in residence” with your team was the foundation of my understanding about what is possible in higher education.

This dissertation and degree were only possible thanks to my wonderful parents, who raised me to understand the value of education and have unwaveringly supported my educational endeavors. For those months that I was working professionally, writing and studying for my Doctoral degree, and wedding planning, my mom was the MVP to help me get it all done. And, my dad was always on the other end of the phone to tell me he was proud. Finally, there are not enough pages in this dissertation to thank my husband, Benjy. A line from our vows, written

halfway through this degree: “I love that you believe there are no limits to what I can accomplish, you support my ambitions and encourage me to reach higher.” We have only just begun.

## TABLE OF CONTENTS

Acknowledgements.....	ii
List of Tables .....	vi
List of Figures.....	vii
Abstract.....	viii
Chapter One: Introduction .....	1
Background of the Problem .....	2
Importance of Addressing the Problem .....	4
Organizational Context and Mission .....	5
Organizational Performance Goal.....	6
Description of Stakeholder Groups.....	7
Stakeholder Groups’ Performance Goals.....	8
Stakeholder Group for the Study .....	10
Purpose of the Project and Questions .....	10
Conceptual and Methodological Framework.....	11
Definitions.....	12
Organization of the Study .....	12
Chapter Two: Literature Review.....	14
The Changing Role of Universities.....	14
Universities’ Struggle to Remain Relevant .....	15
Universities’ Growing Role in Fostering Regional Development.....	16
Innovation and Entrepreneurship in Higher Education .....	19
Evolution of the Entrepreneurial University .....	19
Challenges to Building an Entrepreneurial University.....	21
Overcoming Challenges to Build a Culture of Entrepreneurship .....	22
Elements of a Culture of Innovation and Entrepreneurship .....	22
Fostering a Culture of Innovation and Entrepreneurship in Higher Education .....	23
Role of Faculty in University Innovation and Entrepreneurship.....	25
Faculty Knowledge, Motivation and Organizational Influences .....	27
Knowledge .....	27
Motivation .....	30
Organization.....	33
Conclusion .....	37
Chapter Three: Methods .....	39
Participating Stakeholders .....	39
Survey Sampling Criteria and Rationale .....	40
Survey Sampling Strategy and Rationale.....	40
Interview Sampling Criterion and Rationale.....	41
Interview Sampling Strategy and Rationale .....	41
Data Collection and Instrumentation .....	42
Surveys.....	43
Interviews.....	44
Data Analysis .....	45
Validity and Reliability.....	47
Credibility and Trustworthiness.....	48
Ethics.....	48
Limitations and Delimitations.....	49

Chapter Four: Findings .....	51
Participating Stakeholders .....	52
Interview Participants.....	52
Survey Participants.....	54
Findings.....	56
Knowledge Findings.....	58
Motivation Findings .....	64
Organizational Findings .....	75
Emergent Themes Beyond the Anticipated Influences .....	94
Conclusion .....	99
Chapter Five: Recommendations.....	101
Discussion of Key Findings.....	102
Recommendations.....	104
Recommendation 1: Define and Communicate the Desired Entrepreneurial, Risk-Taking Behavior .....	104
Recommendation 2: Build a University-Wide Unit to Identify and Support Entrepreneurial Faculty.....	105
Recommendation 3: Revamp NUtech.....	109
Recommendation 4: Adapt Faculty Incentives and Reward Structure.....	111
Implementation Considerations .....	114
Resource Requirements and Timing .....	114
Implementation Constraints and Challenges .....	116
Evaluation Plan .....	118
Evaluating Recommendation 1: Define and Communicate the Desired Entrepreneurial, Risk-Taking Behavior.....	119
Evaluating Recommendation 2: Build a University-Wide Unit to Identify and Support Entrepreneurial Faculty .....	121
Evaluating Recommendation 3: Revamp NUtech.....	123
Evaluating Recommendation 4: Adapt Faculty Incentives and Reward Structure.....	125
Limitations and Future Research .....	127
Conclusion .....	128
References.....	130
Appendix A: Survey Instrument .....	139
Appendix B: Interview Questions.....	142
Appendix C: Information Sheet for Interview Participants .....	144

## LIST OF TABLES

Table 1 Organizational Mission, Global Goal and Stakeholder Performance Goals.....	9
Table 2 Assumed Knowledge Influences.....	30
Table 3 Assumed Motivation Influences.....	33
Table 4 Assumed Organization Influences.....	37
Table 5 Interview participants (n = 12).....	53
Table 6 Influences and validation status.....	57
Table 7 Assumed Knowledge Influences and validation status.....	64
Table 8 Assumed Motivation Influences and Validation Status.....	75
Table 9 Assumed Organizational Influences and Validation Status.....	94
Table 10 Validated Influences.....	102
Table 11 Summary of recommendation resource requirements and timeline.....	116
Table 12 Evaluation Plan for Recommendation 1.....	120
Table 13 Evaluation Plan for Recommendation 2.....	122
Table 14 Evaluation Plan for Recommendation 3.....	124
Table 15 Evaluation Plan for Recommendation 4.....	126

## LIST OF FIGURES

Figure 1 Survey Participants by College .....	55
Figure 2 I have Engaged in Entrepreneurial Activity as Defined by This Study.....	56
Figure 3 I Understand the Steps Necessary for Me to Engage in Entrepreneurial Activity .....	61
Figure 4 When it Proves Difficult to Apply My Research to Practical Solutions, I Can Figure Out How To Do It .....	63
Figure 5 Faculty Perceived Benefits Associated with Entrepreneurial, Risk Taking Behavior.....	66
Figure 6 Faculty Perceived Benefits Associated with Entrepreneurial, Risk Taking Behavior Filtered by Self-Reported Engagement in Entrepreneurial, Risk-Taking Behavior .....	67
Figure 7 I Believe That I Could Be Successful at Engaging in Entrepreneurial Activity .....	69
Figure 8 Engaging in Entrepreneurial Activity Is Worth My Time .....	71
Figure 9 Faculty Perceived Barriers Associated With Entrepreneurial, Risk Taking Behavior.....	72
Figure 10 If I Attempt Entrepreneurship and It Is Not Successful, It Will Hurt My Reputation Within the University.....	74
Figure 11 UNL Supports a Culture of Willingness to Take Risks and Adopt New Behavior, Specifically Related to Entrepreneurship.....	78
Figure 12 I Would Engage in Entrepreneurial Activity More Often if I Would be Rewarded Through Faculty Incentive Structures.....	81
Figure 13 UNL Offers Dedicated Services to Support Faculty in Entrepreneurial Activity .....	87
Figure 14 I Would Like More Support Connecting my Research To industry .....	88
Figure 15 UNL Has Promoted the Resources Available to Support Faculty Entrepreneurial Activity .....	93

## ABSTRACT

Higher education institutions (HEIs) are generally resistant to change and struggle to remain relevant amidst the changing social and economic context in the United States. As knowledge increasingly drives economic activity, society expects universities, as creators and distributors of knowledge, to play a larger role in economic development at the regional and national levels. Some universities struggle to take on an augmented position in economic development due to a resistance to change within the organization. Yet, those institutions that do take risks and embrace change have the opportunity to play an increasingly central role in the economic and social development of their regions, which means increased relevance and sustainability for the region as well as the institution. Because HEIs are generally more comfortable operating the way they have for many decades, it will take fostering a culture of taking risks for a university to challenge the status quo and embrace its role to spur economic development in a knowledge-based society.

This study used a case study approach to explore the innovations and changes that would need to occur within a land grant, research university to increase faculty engagement in entrepreneurial, risk-taking behavior. The research sought to answer the questions: What are the knowledge, motivation, and organizational influences dimensions that have enabled some faculty to engage in entrepreneurial risk-taking behavior? And, how can those influences be fostered to increase this behavior? The qualitative study gathered data via a faculty survey and interviews, which were coded and analyzed. Data indicated that faculty conceptually understand the benefits of entrepreneurial risk-taking endeavors but could use additional support to understand the process and skills to execute. While the majority of faculty reported that entrepreneurial behavior was worth their time, few actually engaged in such behavior due to institutional barriers. Overall,



organizational changes to encourage and support entrepreneurial behavior would be required to increase overall incidence of such behavior.

*Keywords:* higher education, entrepreneurship, innovation, faculty

## CHAPTER ONE: INTRODUCTION

The problem of practice addressed by this dissertation is that higher education institutions (HEIs) are generally resistant to change and struggle to remain relevant amidst the changing social and economic context in the United States. As knowledge increasingly drives economic activity, society expects universities, as creators and distributors of knowledge, to play a larger role in economic development at the regional and national levels (Nelles & Vorley, 2011; Schmitz, Urbano, Dandolini, de Souza, & Guerrero, 2017). Some universities struggle to take on an augmented position in economic development due to a resistance to change within the organization (Layne & Lake, 2015). Yet, those institutions that do take risks and embrace change have the opportunity to play an increasingly central role in the economic and social development of their regions (Urbano & Guerrero, 2013), which means increased relevance and sustainability for the region as well as the institution (Etzkowitz, 1998; Etzkowitz, Webster, Gebhardt, & Terra, 2000). Because HEIs are generally more comfortable operating the way they have for many decades (Christensen & Eyring, 2011; Layne & Lake, 2015;), it will take fostering a culture of taking risks for a university to challenge the status quo and embrace its role to spur economic development in a knowledge-based society.

This study examines this problem of practice in the context of the University of Nebraska – Lincoln (UNL). In 2019, UNL identified fostering a culture of risk-taking as a part of its strategic direction, which would require change within the institution. The goal of this shift is to catalyze connections between research and expertise within the university and the surrounding region to spur economic and social development in Nebraska.

## **Background of the Problem**

Recent years have seen an increasing rate of closures at institutes of higher education in the United States (Seltzer, 2018). Some researchers believe that these closures are evidence that HEIs have been relatively slow to recognize and adapt to the needs of their surrounding geographic region, the country, and the world (Layne & Lake, 2015; Nelles & Vorley, 2011). In this context, HEIs are struggling to remain relevant in a changing world. Only recently have universities begun to embrace a role in regional economic development, specifically through a more entrepreneurial orientation.

Research indicates that universities have an impact on the economic and social development of the regions in which they are situated (Etzkowitz et al., 2000; Goldstein et al., 1995). Yet, only recently have universities begun to recognize and embrace their role in regional development as a third mission, in addition to teaching and research (Saiz-Santos, Araujo-Dela Mata, & Hoyos-Iruarrizaga, 2017). In many institutions this third mission takes the form of a focus on innovation and entrepreneurship as channels to apply knowledge more directly to society to impact regional economic and social development (Saiz-Santos et al., 2017). Regarding the dual concepts of innovation and entrepreneurship, Schmitz et al. (2017) highlighted that innovation refers to the knowledge while entrepreneurship applies to the process. Schmitz et al. (2017) provided a robust review as to “the interrelatedness and complementary roles of innovation and entrepreneurship in the academic setting” (p. 88), giving permission to link these concepts.

Activities associated with the entrepreneurial university that originally received the most attention include technology transfer, spinoffs, and partnerships with industry (Abreu & Grinevich, 2013). As the research on the topic grew over time, the study of and the definition of

“academic entrepreneurship” (Wood, 2011) also expanded and matured (Wright, 2014). Other authors have sought to create a broader definition for academic entrepreneurship that includes the entire university (Abreu & Grinevich, 2013). Etzkowitz et al. (2000) introduced the idea of the “entrepreneurial university,” in which the institution itself is fundamentally re-aligned to achieve a third mission of social and economic development, on top of the original missional components of research and teaching. In this model, the tripartite mission of research, teaching and economic development are melded together and mutually reinforced, stemming from the shift to a knowledge-based society, where these elements are increasingly overlapping (Etzkowitz et al., 2000). Urbano and Guerrero (2013) also noted that entrepreneurship at a university “requires a supportive climate to promote the drive for innovation and entrepreneurship in all members” (p. 44). These articles transition entrepreneurship and innovation in higher education from individual actors or activities to an institutional paradigm.

The literature indicates that there are three primary reasons for an institution to embrace entrepreneurship and innovation. The first reason is to be more relevant as an institution in a knowledge-based society. Layne and Lake (2015) assert that the default position of universities is to continue their current trajectory, and therefore, HEIs are increasingly challenged to explain how their educational offerings and degrees are relevant. Drucker’s (1998) assertion that entrepreneurship positively impacts an organization’s social potential provides a response to Layne and Lake’s concerns. The second reason is to improve an institutions’ financial position. Academic entrepreneurship provides a way to generate market value for what universities have always done – create and transfer knowledge (Urbano & Guerrero, 2013). In a context where many universities are facing financial vulnerability (Christensen & Eyring, 2011), financial gain is a key driver for entrepreneurial activity in the short-term. The third reason is to create social

value (Schmitz et al., 2017), including improved economic performance in the university's surrounding geographic area (Etzkowitz et al., 2000). Wood (2011) brought these reasons together by stating that "universities that successfully embrace entrepreneurship have the opportunity to generate much-needed revenue, to help spur economic development and job creation, and to produce solutions for some of our most pressing problems" (p. 160).

The heightened form and function of an entrepreneurial university that seeks to impact regional economic growth requires different organizational capacities, mindsets, metrics and other forms of change (Goldstein, 2010). Brettel, Chomik, and Flatten (2015) established that there are conditions within organizational culture that specifically foster an entrepreneurial orientation. Originally explored in relation to business and industry, research has shown that several factors influence entrepreneurial behavior in an organizational setting. These factors include elements such as human resources management (Hayton, 2005), the characteristics of social networks within the organization (Floyd & Wooldridge, 1999), knowledge creation (Zahra, Nielsen, & Bogner, 1999), and cooperative behavior among employees (Peris-Ortiz, 2009). Chrisman, Hynes, and Fraser (1995) also show that a university's policies and procedures impact faculty entrepreneurship. In order to create the systems and capacities needed to take on a more deliberate role in regional economic development as a third mission, a university will need to overcome resistance to change and develop an organizational culture that encourages risk-taking.

### **Importance of Addressing the Problem**

The problem of HEIs' resistance to change is important to address for a variety of reasons. In an increasingly knowledge-driven world, there is a societal expectation that universities foster regional, and even national, economic development (Nelles & Vorley, 2011;

Schmitz et al., 2017). Yet, embracing this role will require new capabilities and mindsets, which requires taking risks (Goldstein, 2010). Therefore, creating a culture of risk-taking is critical for a university to pursue a more central position in regional economic development.

If the faculty and staff are not able to take risks with new ideas and ways of operating, the university will not have the capacity to succeed in its role to spur economic development in the region. In this case, the region and its people will suffer from lost economic opportunities. Additionally, the university will struggle to remain relevant (Layne & Lake, 2015), and HEIs that are no longer seen as relevant will eventually have financial challenges. Additionally, The National Center for Education Statistics published a report indicating that post-secondary enrollment declined seven percent between 2010 and 2017. On the other hand, if a university is able to encourage risk-taking and entrepreneurial behavior, the literature shows that entrepreneurship and innovation at an institution of higher education can have a positive impact on many levels, including individual (Martin, McNally, & Kay, 2013) and socioeconomic (Urbano & Guerrero, 2013), as well as on the sustainability of the institution itself (Etzkowitz et al., 2000).

### **Organizational Context and Mission**

The University of Nebraska – Lincoln (UNL) is Nebraska’s flagship public research institution. Founded in 1869, UNL is a land grant university in the United States. The university has had three parts to its mission over the last 150 years: teaching, research and service. UNL supports a \$300 million budget, with almost a third of that amount dedicated to research. In 2018, UNL enrolled approximately 24,000 students, which represents a 7% increase over the past decade. Of the students enrolled in 2018, 16% are students of color, and a third are from out-of-state. UNL supports approximately 1,700 faculty and 4,000 staff. The university is situated

near the center of Lincoln, a city of approximately 300,000 people (University of Nebraska – Lincoln, 2018).

For its 150<sup>th</sup> anniversary in 2019, UNL created The Nebraska Commission of 150 (N | 150), which involved a group of leaders engaging in a visioning and strategic planning process throughout 2018. The purpose of the N | 150 Commission was to think about the needs of the students and the state over the coming 25 years, and how the university could best meet those needs. The mission coming out of the N | 150 process states: “The University of Nebraska unites bold trailblazers from around the globe to positively transform lives, land, and society. Our inclusive culture expects excellence and creates connections among learners within – and beyond – the university” (University of Nebraska – Lincoln, 2018). UNL’s vision is “uniting bold trailblazers to create a better life” (University of Nebraska – Lincoln, 2018). Part of the N | 150 report states that UNL will “support a campus-wide ethos of informed risk taking” as one of the ways in which it will fulfill its role as a driver of economic development in the state of Nebraska in pursuit of this mission and vision (University of Nebraska – Lincoln, 2018), which directly relates to the organizational performance goal addressed in this study.

### **Organizational Performance Goal**

By 2025, UNL will serve as a catalyst for growth and prosperity in Nebraska through a 10% increase in occurrence of UNL faculty engaging in entrepreneurial risk-taking behaviors. In regards to entrepreneurial risk-taking behaviors, this study will use the functional definition put forth by Ahwireng-Obeng (1993), “a type of activity or practice with implications for generating jobs, fostering innovation and increasing productivity by means of which the creation of incomes and wealth is enhanced” (p. 151). This specific definition was also highlighted by Sternberg (2014) in his work related to land grant universities. Through the N | 150 process, UNL

leadership determined that an ethos of informed risk-taking is a particular area in which the university needs to improve in order to better fulfill its mission, its responsibility as a land grant institution, and societal expectation in an increasingly knowledge-based economy.

### **Description of Stakeholder Groups**

There are several key stakeholder groups related to a university-wide goal associated with furthering an ethos of informed risk-taking. First, the administration at UNL, specifically the senior leadership, are a key stakeholder in this organizational goal. The senior leadership members are the group that initially recognized the responsibility for UNL to be an engine for economic growth. This group also identified the need to advance an ethos of informed risk-taking across the university to better fulfill this role in the state. The administration is also the group that sets the organizational policies and practices that influence the culture of the university as a whole. In other words, they set the high-level conditions that either encourage or discourage informed risk-taking behaviors by faculty and staff. Second, the UNL faculty are a key stakeholder in this organizational goal because they are the group that must actually change behavior in order to achieve the goal. While faculty are impacted by the policies, practices, and culture of the university overall, which is set by the administration, it is their behavior that the goal directly impacts. Third, business and civic leaders are another group of stakeholders related to this organizational goal because faculty need assistance from and partnerships with leaders outside of UNL in order to engage in much of the entrepreneurial risk-taking behaviors that are stated in the goal. Additionally, the goal is intended to directly impact business and society in Nebraska external to UNL. Therefore, business and civic leaders must participate with UNL for the university to be effective as an engine for economic growth in the state. Business and civic



leaders stand to benefit from UNL playing a deliberate role in regional economic development, and they can help UNL achieve greater effectiveness in this role.

While there will be numerous other stakeholder groups involved in achieving the organizational goal of increasing informed risk-taking behavior, these three groups have the most direct impact on goal achievement.

### **Stakeholder Groups' Performance Goals**

The behavior of each of the stakeholder groups mentioned in the previous section feeds into the organization's ability to achieve the organizational goal, and in turn achieve its mission.

The following table shows how each of these elements build on each other.

**Table 1**

*Organizational Mission, Global Goal and Stakeholder Performance Goals*

---

Organizational Mission		
<p>The University of Nebraska-Lincoln attracts bold thinkers in the quest for knowledge and the search for truths greater than ourselves. Nebraska provides one of the world’s premier learning environments because we:</p> <ul style="list-style-type: none"><li>• Seek new ways of knowing, understanding, and improving our world;</li><li>• Empower our students to co-create their learning experiences;</li><li>• Instill a life-long desire to learn, inquire, and explore; and</li><li>• Ensure a diverse and inclusive culture where every person and every interaction matter.</li></ul>		
Organizational Performance Goal		
<p>By 2025, UNL will serve as a catalyst for growth and prosperity for Nebraska through a 10% increase in occurrence of UNL faculty engaging in entrepreneurial risk-taking behaviors*.</p> <p><i>*For entrepreneurial risk-taking behaviors, this study will use the functional definition put forth by Ahwireng-Obeng (1993), “a type of activity or practice with implications for generating jobs, fostering innovation and increasing productivity by means of which the creation of incomes and wealth is enhanced” (p. 151).</i></p>		
Administration Goal	Faculty Goal	Business/Civic Leaders Goal
<p>By fall 2023, the senior leadership at UNL will integrate new policies or practices that encourage entrepreneurial risk-taking behaviors by faculty.</p>	<p>By fall 2025, at least 10% of UNL faculty who have not previously done so will engage in entrepreneurial risk-taking behavior (as defined above).</p>	<p>By fall 2027, at least 50 additional business and civic leaders in the state are engaged in a partnership with UNL faculty to advance growth and prosperity in the state. This number is in addition to those leaders who are currently engaged in 2020.</p>

---

## **Stakeholder Group for the Study**

While all stakeholders mentioned in the previous section play a role in achieving the organizational goal of supporting entrepreneurial risk-taking behavior, it is important to first understand the behavior of faculty. Specifically, this study will help the leadership at UNL better understand why those faculty who engage in entrepreneurial, risk-taking behavior do so, in order to inform how the university can increase the number of additional faculty engaging in this behavior. Understanding the faculty knowledge, motivation, and organization dimensions that encourage the desired behavior will then help the administration set appropriate policies and practices to advance an ethos of informed risk-taking. The faculty stakeholder goal that at least 10% of UNL faculty who have not previously done so will engage in entrepreneurial risk-taking behavior was set as additive to current levels because there is a subset of faculty who already engage in risk-taking behavior and will continue to do so regardless of UNL's efforts. UNL will need to get a baseline measurement of risk-taking behavior before implementing any changes in order to track progress toward the stated stakeholder goal. The faculty stakeholder goal is set as a 10% increase over five years because the organizational goal and intended outcomes are associated with a change in culture. Therefore, while the intention is that more faculty would engage in entrepreneurial risk-taking behavior over the long-term as the culture shifts, the goal starts at 10% by 2025 and would increase in later years.

## **Purpose of the Project and Questions**

The purpose of this project is to conduct an analysis to understand how UNL could work to advance an ethos of informed risk-taking, which is in service of UNL's larger goal to play a greater role in catalyzing economic growth in the state of Nebraska. Specifically, this study explored the areas of knowledge and skill, motivation, and organizational resources necessary to

spread a culture of informed risk-taking. The analysis began by developing a list of possible needs and then moved to examining these needs systematically to focus on actual or validated needs. This analysis focused specifically on the disposition and behavior of faculty, though recommendations also address how the administration can implement organizational policy or practices to influence faculty mindset and behavior. As such, the questions that guided this study are the following:

1. What are the knowledge, motivation, and organizational influences that enable some faculty to engage in entrepreneurial risk-taking behavior?
2. How can the knowledge, motivation, and organizational influences that support faculty engagement in entrepreneurial, risk-taking behavior be fostered to increase this UNL faculty behavior by 10%?

### **Conceptual and Methodological Framework**

This study used a gap analysis framework developed by Clark and Estes (2008). Gap analysis provided a systematic method to define an organization's performance goals and then to identify gaps between an organization's current performance relative to those goals. As an innovation study, this project specifically concentrated on knowledge, motivation and organization needs to create a desired change. This study employed a qualitative case study methodology. A literature review generated potential knowledge, motivation and organization needs to achieve the organizational goal. These needs were then assessed using a survey and interviews with faculty. The study then laid out recommendations and solutions to achieve the organizational goal.

## **Definitions**

*Economic development:* The adoption of new technologies, increase in job opportunities, and improvement of living standards in a geographic region.

*Risk-taking behavior:* Risk-taking is focused on behaviors that are different from traditional behavior in a university setting, specifically those behaviors that may lead to entrepreneurial activity, which in turn could lead to regional development. This study will use the functional definition put forth by Ahwireng-Obeng (1993), “a type of activity or practice with implications for generating jobs, fostering innovation and increasing productivity by means of which the creation of incomes and wealth is enhanced” (p. 151).

*Ethos:* The general mindset and approach of a community as manifested in its attitudes and aspirations. For the purposes of this study, ethos and mindset will be used interchangeably, and are assumed to be influenced directly by an organizational culture.

## **Organization of the Study**

This dissertation includes five chapters. Chapter One provides the background context and rationale for pursuing this study. It also includes the organization’s mission, the organizational and stakeholder goals that will be addressed in the following chapters, and the frameworks used throughout the study. Chapter Two provides a review of current literature related to the study. It includes topics related to organizational culture, entrepreneurship, and the university’s role in regional economic growth. Chapter Three details the assumed knowledge, motivation, and organization needs for this study, and lays out the study’s methodology, including choice of participants, data collection and analysis. Chapter Four provides an assessment and analysis of the data and results. Chapter Five delivers recommendations, based

on data and literature, for addressing the needs and closing the performance gap as well as recommendations for an implementation and evaluation plan for the solutions.

## CHAPTER TWO: LITERATURE REVIEW

This literature review explores research regarding the evolution of HEIs and their role in society over the past century that has led to the problem of practice addressed in this study. The chapter then examines the role of innovation and entrepreneurship in higher education to date. Finally, the literature draws on the literature regarding entrepreneurship among HEIs, as well as literature from the business field to lay the groundwork for how HEIs can incorporate entrepreneurship into their culture. The latter section reviews the literature behind the knowledge, motivation, and organizational influences that affect faculty behavior in this study.

### **The Changing Role of Universities**

Since as far back as early part of the 20th century, there has been a notion in the United States that a university should go beyond transmitting knowledge to the next generation and include research and serving the community. This idea was reflected in the Wisconsin Idea, which was a commitment promulgated by the University of Wisconsin president in 1905, believing that the benefits of the university should touch every resident of the state. Perkins (1973) also called attention to this third wave of universities' evolution in their mission and role to society, from teaching and transmission of knowledge originally, next incorporating research and the generation of knowledge along with teaching, and finally adding service to society as a core element to the mission. Research has found that HEIs play an important role in regional development (Etzkowitz et al., 2000; Goldstein & Glaser, 2012). As the demands on higher education change and HEIs fight to adapt, they are increasingly recognizing and owning their role in society as an integral part of their work.

## **Universities' Struggle to Remain Relevant**

Increasingly, HEIs are challenged to remain socially and economically relevant. A Strada-Gallup consumer study found that “only 26% of working U.S. adults with college experience strongly agree that their education is relevant to their work and day-to-day life” (Strada-Gallup, 2018, p. 5). At the same time, a National Center for Education Statistics report indicates that, though enrollment at all degree-granting post-secondary institutions has increased overall since 2000, enrollment declined by seven percent in more recent years between 2010 and 2017 (National Center for Education Statistics, 2019). As early as 2006, the U.S. Department of Education issued a report stating that, “American higher education has become what, in the business world, would be called a mature enterprise: increasingly risk-averse, at times self-satisfied, and unduly expensive” (U.S. Department of Education, 2006, p. ix). Christensen and Eyring (2011) agreed with this assessment and highlighted that this phenomenon is an indication that colleges are no longer offering what people find valuable, noting that higher education is ripe for disruption. And yet, universities are notorious for their adherence to their traditional roles of teaching and research and slow pace of change (Christensen & Eyring, 2011; Layne & Lake, 2015).

As HEIs are slow to adapt to the current context, they are increasingly challenged to explain how their educational offerings and degrees are relevant (Layne & Lake, 2015; Nelles & Vorley, 2011; Schmitz et al., 2017). As the creators and transmitters of knowledge, society expects HEIs to play an ever-larger role in economic development at the regional and national levels (Nelles & Vorley, 2011). But, universities struggle to shed their adherence to traditional ways of operating in order to take on this role, and therefore struggle to remain relevant in the eyes of the public. Amidst these challenges, state tuition rates are also increasing. At public



institutions, the undergraduate tuition, fees, room, and board prices increased 31% after adjusting for inflation between 2006–07 and 2016–17 (National Center for Education Statistics, 2017, 2018). As the stated tuition price of higher education increases at the same time that universities are struggling to remain relevant, society’s perceived value of higher education diminishes. A 2018 Gallup poll found that U.S. adults with “a great deal” or “quite a lot” of confidence in higher education dropped from 57% in 2015 to 48% in 2018 (Jones, 2018). This confluence of factors leads to many colleges facing enrollment and financial challenges, forcing them to look closely at their role in society.

### **Universities’ Growing Role in Fostering Regional Development**

As HEIs begin to fight to remain relevant amidst changing societal expectations, they are increasingly recognizing their impact on regional economic and social development and incorporating this role as a part of their mission and work. Sternberg (2014) cited the original language of the Morrill Act in 1862 that created land grant institutions, asserting that the original intent of land grant institutions was to advance economic development.

In Nebraska, a state that relies heavily on the agriculture industry, the University of Nebraska is seen as a critical institution to foster development, as evidenced by the creation of the University of Nebraska Institute of Agriculture and Natural Resources (IANR) at UNL, established through Nebraska Legislature in 1973 (University of Nebraska – Lincoln, 2019). The university has an impact on regional economic development. The President of the University of Nebraska system reported that the return on investment in the university is 300% for university as a whole, and the return on investment for IANR is 15 times (University of Nebraska – Lincoln, 2019). Additionally, the statements in the first half of 2019 around the most recent state budget approval, which included funding for the University of Nebraska, indicated that state

leaders believed the university should continue to play a key role in the development of Nebraska and its residents. The President of the University of Nebraska system stated that the funding for the university was a signal regarding “the state’s commitment to affordable, competitive higher education that grows our economy and quality of life” (Lee, 2019). Both state and university leadership clearly see UNL as a critical player tasked with contributing to regional development.

Contributing to regional development is intimately related to the mission of service to society. Similar to Perkins’s (1973) writings regarding the third wave of universities’ evolution, Etzkowitz (1998) also noted that higher education is in the midst of a “second revolution,” where the entrepreneurial university integrates economic development into the university as a third mission, in addition to teaching and research. Etzkowitz (1998) then went a step further, stating that this broadened mission establishes the HEI as an economic actor itself and links the university more closely to the region that benefits from its knowledge.

In an increasingly knowledge-based society, universities, as the key creators and generators of knowledge, are important players in regional economic development. Research indicates that universities’ surrounding geographic areas show improved economic performance (Etzkowitz et al., 2000). Birch (1987) highlighted that universities, especially research universities, provide a “natural resource” for innovation in an economy that is based on constant innovation. Universities contribute to local economies through research, which can lead to inventions and innovations, which can then be connected to the world through entrepreneurial methods such as faculty spinoffs and tech transfer (Chrisman et al., 1995). Because universities are regional resources for knowledge, they act as an asset for competitiveness of the region in the global economy (Goldstein & Glaser, 2012). Sternberg (2014) stated that, “the theoretical

foundation for entrepreneurial focus on economic development is based on the ever growing body of research that shows that entrepreneurship is one of the foundations in building and maintaining economies and societies and is key to the functioning of market economies and in job creation” (p. 254). In this way, universities that embrace entrepreneurship can spur economic development and job creation (Wood, 2011), leading to regional development.

The Association of University Technology Managers Licensing Activity Survey (AUTM, 2017) provided evidence that HEIs are increasingly embracing entrepreneurship. The 2017 AUTM Licensing Survey found that in 2017, 1,080 start-ups formed out of HEIs. Additionally, HEIs received over \$3 billion in revenue from licensing in 2017 alone (AUTM, 2017). These data indicate that the potential for business creation from university entrepreneurship is significant. The AUTM survey also found that 72.4% of the start-ups founded in 2017 were based in the home state of the HEI associated with their formation, indicating that most academic entrepreneurship benefits the geographic region.

In addition to economic development, some research has also focused on the social value that universities contribute. Much of this social value is created through applying the knowledge and inventions developed within universities to pressing social problems through entrepreneurship. Urbano and Guerrero (2013) and Wood (2011) wrote about the entrepreneurial university as a driver of regional development – both economic and social – by producing and utilizing knowledge that can be applied in entrepreneurial opportunities through the creation of new ventures or commercialization of research.

In this way, knowledge creation and entrepreneurship have become increasingly consequential themes in higher education as universities fight to stay relevant, which improves their ability to be competitive in the higher education market. “Just because things have always

been like this” (Layne & Lake, 2015, p. 3) is not sufficient anymore as their academic offerings exist in a competitive market (Layne & Lake, 2015). And while many universities find it challenging to break from tradition, there are positive models of entrepreneurship and innovation transforming HEIs.

### **Innovation and Entrepreneurship in Higher Education**

Entrepreneurship at a HEI can have an impact on many levels. Chrisman et al. (1995) found that entrepreneurship could lead to substantial monetary gain for individual faculty members. The AUTM Licensing Survey (2017) found that 7,459 patents were issued in 2017, which was the highest ever reported in one year. Etzkowitz et al. (2000) noted the positive impact that entrepreneurship could have for the sustainability of the HEI. Etzkowitz et al. (2000) highlighted that tech transfer has become a substantial revenue source for some HEIs, which is supported by the AUTM data on licensing revenues reported in the previous section (AUTM, 2017). Urbano and Guerrero (2013) reported on the impact of entrepreneurship on regional socioeconomic development, noting that the majority of entrepreneurial activity from a university is carried out in the home state (AUTM, 2017).

### **Evolution of the Entrepreneurial University**

As the AUTM data indicates, innovation and entrepreneurship are playing an increasingly prominent role in higher education over recent decades. There is a growing body of literature regarding entrepreneurship and innovation in higher education settings globally. While some authors focus on teaching and curriculum to foster entrepreneurship and innovation beyond the university, others focus on institutional-level activities and models. As the research developed over time, the study of and the definition of “academic entrepreneurship” (Wood, 2011) has expanded and matured (Wright, 2014). Literature on entrepreneurship and innovation in HEIs

has evolved from focusing primarily on tech transfer and other specific activities at a university to discussing the qualities and benefits of an entrepreneurial university. Regarding the dual concepts of innovation and entrepreneurship, Schmitz et al. (2017) highlighted that innovation refers to the knowledge while entrepreneurship applies to the process. Schmitz et al. (2017) provided a robust review as to “the interrelatedness and complementary roles of innovation and entrepreneurship in the academic setting” (p. 88), giving permission to link these concepts. This literature review focused on the entrepreneurship and innovation at the institutional level.

Early literature on the topic of entrepreneurship and innovation in higher education had a relatively narrow focus on activities that bring academic research to market, such as licensing, tech transfer, and the formation of start-up companies (Abreu & Grinevich, 2013). Abreu and Grinevich (2013) gave two reasons for this focus. First, bringing ideas to market is where the wider, non-academic literature on entrepreneurship has focused, and second, these activities are more easily observed and measured as evidence of entrepreneurial and innovative activities on which an author can report (Abreu & Grinevich, 2013). In order to expand the research regarding entrepreneurship at universities, a number of authors have sought to create a broader definition for academic entrepreneurship that includes the entire university (Abreu & Grinevich, 2013). Etzkowitz et al. (2000) introduced the idea of the “entrepreneurial university,” in which the institution itself is fundamentally re-aligned to achieve economic development as a key part of the mission, along with research and teaching. In this model, the three elements of research, teaching and economic development are melded together and mutually reinforced, which stems from the shift to a knowledge-based society, where the overlap between government, industry, and academia becomes increasingly significant (Etzkowitz et al., 2000, p. 314). Urbano and Guerrero (2013) also noted that entrepreneurship at a university “requires a supportive climate to

promote the drive for innovation and entrepreneurship in all members” (p. 44). These articles therefore work to transition entrepreneurship and innovation in higher education from individual actors or activities to an organization-wide paradigm.

### **Challenges to Building an Entrepreneurial University**

There are a number of reasons why universities are resistant to change, and the literature lays out some of the challenges that universities face. Additionally, outside of higher education, there is an entire field of literature that addresses the challenges to organizational change. In the current context, universities struggle with the need to adapt to shifting demands. Hamel and Valikangas (2003) found that organizations face four challenges to adapting. First, organizations lack the awareness of how the status quo is changing and the ability to think through how those changes will impact the organization. Second, because they are unaware or unable to think through the changes, they often lack the ability to create real alternatives to the current strategy in order to adapt to those changes. Third, without a new strategy, organizations are unable to reallocate resources from current priorities to the new capabilities needed. And finally, organizations often seek static excellence, rather than continuous improvement and renewal. Gino (2018) reinforced this point by noting that leaders tend to optimize for current operations rather than being curious and exploring new ways that might be better.

One challenge specific to HEIs is that a university is one of the most complex organizations that exist today (Marshall, 2011; Perkins, 1973). Within one university there are a myriad of objectives, and each stakeholder desires change where it fits their own objectives and resists change that upset their view of the university as an institution (Marshall, 2011). These conflicting purposes represent a key barrier to change within the organization. Similarly, Perkins (1973), who wrote about the evolution of the universities’ mission to include teaching, research

and service to society, noted that universities now have these three missions, yet the organizational structure was set up only for the first mission, which was teaching. He noted that the third mission of public service requires the institution to have a broad commitment to society, which is difficult in the decentralized structure that developed around teaching different faculties. This represents another way of showing that a shared purpose for change across the university is a primary obstacle to achieving change. With disparate stakeholders and objectives, the best path for HEIs to create change will be through building a general culture of innovation and entrepreneurship.

### **Overcoming Challenges to Build a Culture of Entrepreneurship**

The previous sections laid out why universities need to cultivate innovation and entrepreneurship to spur regional development. Previous sections also highlighted how universities are generally slow to take up this change. This section lays out what it would take for HEIs to create a culture that encourages innovation and entrepreneurship.

### **Elements of a Culture of Innovation and Entrepreneurship**

While individuals carry out innovative and entrepreneurial behavior, the organizational setting in which these individuals operate has substantial impact on encouraging or suppressing that behavior. The concept of entrepreneurship, as defined by innovation and new ways to solve problems (Drucker, 1998), does not have to be confined to an individual acting alone, but it can be placed within an organizational setting. Employees in corporate settings can be entrepreneurial by identifying new opportunities or finding innovative ways to solve problems within their organization. An individual's ability to act as an entrepreneur in an organizational setting is influenced by the organization's context and management (Peris-Ortiz, 2009). In other words, an organization's culture impacts the entrepreneurial orientation of that organization

(Brettel et al., 2015). Several factors have been shown to influence entrepreneurial behavior in an organizational setting, such as human resources management (Hayton, 2005), the characteristics of social networks within the organization (Floyd & Wooldridge, 1999), and knowledge creation (Zahra et al., 1999). Peris-Ortiz (2009) highlighted the importance of cooperative behavior among employees, a finding supported by Gino (2018), who found that curiosity, in particular, encourages engagement and collaboration while reducing external conflict, thereby leading to increased innovative behaviors.

In thinking about new abilities required, Hayton (2005) asserts that corporate entrepreneurship “involves organizational learning, driven by collaboration, creativity and individual commitment” (21). By contrast, Akgün, Lynn, and Byrne (2006) focus on “organization unlearning,” which is the ability for employees to alter their perceptions, problem solve rather than follow directions, and alter bad behavior to make changes to operations. This ability to unlearn can also help an organization be flexible and weather turbulent or changing market environments (Akgün et al., 2006; Leal-Rodríguez, Eldridge, Roldán, Leal-Millán, & Ortega-Gutiérrez, 2015). These two seemingly inverse assertions illustrate the complex nature of organizational cultures and the subsequent impact on encouraging new activities and solutions, in other words, entrepreneurial behavior.

### **Fostering a Culture of Innovation and Entrepreneurship in Higher Education**

Research specific to higher education settings has shown specific characteristics that foster innovation and entrepreneurship in a university. Schmitz et al. (2017) provided a lengthy literature review with a table comparing the “characteristics of entrepreneurial universities” across numerous authors. The entrepreneurial university requires different organizational capacity, mindsets, metrics and other elements (Goldstein, 2010). Chrisman et al. (1995) found



that a culture supporting entrepreneurial activity is critical for faculty to engage in these activities.

Urbano and Guerrero (2013) offered a comprehensive list of 11 elements – both internal and external – of an entrepreneurial university, various elements of which have been supported by additional researchers. First, entrepreneurial universities tend to have an organizational structure that minimizes bureaucracy and fosters coordination, rather than tension, across departments. Second, the governance structure is designed such that “the policies and practices within the entrepreneurial university are clearly oriented toward enabling the university’s prospective entrepreneurs” (p. 45). This includes the budget, which can have an impact on potential entrepreneurship via implications to workload, personnel support, and infrastructure (Chrisman et al., 1995). This element is also particularly supported by Wright (2014). Third, the university has a number of systems set up to support entrepreneurial activity. Chrisman et al. (1995) found that while not many faculty utilize formal programs, they also found that the university’s support of such programs sends a strong message to that fosters faculty behavior. Fourth, the attitudes of individuals across the university are favorable toward entrepreneurship. Fifth, role models who have been successful offer ““possibility proof” for the entire community” (Urbano & Guerrero, 2013, p. 45). Sixth, the university offers both monetary and nonmonetary rewards for entrepreneurial behavior. Seventh, the university recruits academics and other personnel who are oriented toward innovation. Eighth, the university experiences financial independence due to increased resources from entrepreneurial activity. Ninth, the university benefits from a physical infrastructure that fosters innovation and connections with funding sources. Tenth, the university has “status and prestige” to attract talent and funding. Eleventh, the university has set up “transdisciplinary and heterogenous structures, as well as hybridizing

organisms for collaborating, networking and partnering with multiple industries, universities and private and public institutions in both national and international contexts” (Urbano & Guerrero, 2013, p. 46).

While not directly related to higher education, Gino (2018) supports many of these same elements in the case for curiosity to spur innovation and new behavior. Specifically, she highlighted that leaders in an organization can bolster curiosity in an organization through hiring for the desired propensity, modeling the desired behavior, emphasizing related learning goals, and facilitating conversations about why this behavior is beneficial, all of which are reflected in the list above. Clearly, to embrace entrepreneurship, a university must look beyond individual actors and incorporate numerous elements to transform the institution.

### **Role of Faculty in University Innovation and Entrepreneurship**

Fostering a culture of innovation and entrepreneurship is ultimately intended to impact the behavior of faculty, who are the individuals who execute on the innovation and entrepreneurship through drawing practical connections between their research, regional development, and the world. Chrisman et al. (1995) found that the rate of faculty entrepreneurship has been accelerating, with the newer activity more likely to have greater impact on economic development. Chrisman et al. (1995) also found that much of faculty entrepreneurship contributes to technology advancements applied in a region as well as the diversification of industry in a region, which means the creation of new ventures outside of the region’s dominant industry. This diversification improves the regional infrastructure, which in turn leads to an increased pace of change and development in the region (Chrisman et al., 1995). These findings connect the role of faculty and faculty behavior specifically with the regional development that universities increasingly seek.

While a university may include entrepreneurship in its mission, individual skills and proclivities are the primary predictors of entrepreneurial behavior (Khorrami, Farhadian, & Abbasi, 2018; Van Dam, Schipper, & Runhaar, 2010). Specifically, two skills emerged as significant predictors of entrepreneurial behavior in faculty. The first is networking skills, both inside and outside of the university setting (Khorrami et al., 2018; Van Dam et al., 2010). The need for networking skills are supported by Chrisman et al. (1995), who found that ventures created by outside entrepreneurs with faculty assistance were larger than those created by the faculty by themselves. The implication is that the ability to connect with networks outside of the university is helpful for faculty to have greater success in their entrepreneurial endeavors. The second key skill is career adaptability, defined as the inclination to change career strategies and efforts based on evolving conditions. (Van Dam et al., 2010; Khorrami et al., 2018). In addition to these two skills, Van Dam et al. (2010) found that teamwork skills increased the likelihood of such behavior in faculty, though Khorrami et al. (2018) did not come to the same conclusion.

Finally, in addition to skills, the knowledge of what entrepreneurial behavior involves is also an influence on faculty behavior (Van Dam et al., 2010). Khorrami et al. (2018) noted that educators' lack of knowledge regarding entrepreneurship, marketing, and market forces generate uncertainty and unpredictability, making it harder for educators to be entrepreneurs. Collectively, the literature shows that if the goal of university leadership is to increase entrepreneurial behavior among faculty, focusing on the development of the necessary skills, inclinations, and knowledge among faculty as individuals would be an integral part of a university's efforts.

In addition to individual faculty members' skills and interests, Sanberg, Gharib, Harker, Kaler, Marchase, Sands, Arshandi, and Sarkar (2014) noted that in order for faculty to apply their research for impact, they need a different mindset and ways of operating than those faculty who

simply aim to conduct research. Sanberg et al. (2014) noted that the shift in faculty mindset has been slow and point to misaligned incentives within the tenure and promotion guidelines as a root cause. These authors advocate for recognition of faculty commercialization efforts in career advancement and point to a number of HEIs where this is already the case. For example, the University of Arizona recognizes “integrative and applied forms of scholarship that involve cross-cutting collaborations with business and community partners, including translational research, commercialization activities, and patents” in its career advancement policies (The Office of the Associate Provost for Faculty Affairs, 2012). At some of Purdue University’s colleges, the tenure and promotion guidelines include commercialization driven by faculty on departmental committees, an illustration of how universities can use faculty as advocates for change (National Academy of Inventors, 2013). Tenure and promotion guidelines represent and organization-level influence on faculty behavior, in addition to the individual skills and knowledge previously discussed.

### **Faculty Knowledge, Motivation and Organizational Influences**

#### **Knowledge**

The literature indicates a number of knowledge-related elements that directly influence entrepreneurial risk-taking behavior in faculty who have not previously engaged in this type of behavior. Anderson and Krathwohl (2001) explain the four kinds of knowledge that are critical to successfully achieve a goal: the basic information or skills associated with the goal (factual), the more complex details and relationships to achieve the goal (conceptual), how to progress toward goal attainment (procedural), and how to self-monitor and adjust based on performance (metacognitive). Yet, Clark and Estes (2008) note that people are often not aware that they lack knowledge or are unwilling to admit their lack of knowledge. This section explores the

knowledge influences that are assumed to be critical for faculty capacity to engage in entrepreneurial risk-taking behavior.

### ***Knowledge of the Potential Benefits of Entrepreneurship***

Research shows that entrepreneurial activity in a university setting can have several benefits for the individual, the institution and the geographic region. Chrisman et al. (1995) concluded that faculty can accrue substantial monetary gain due to entrepreneurial activity. Etzkowitz et al. (2000) wrote about how entrepreneurship can have a positive impact on the sustainability of the university by bringing in revenue to fund additional research, creating a self-generating cycle. Additionally, Urbano and Guerrero (2013) presented the university as a driver of regional development through utilization of the knowledge created at the university and connecting it to entrepreneurial activities, thereby leading to new companies, increased competition and diversity in industry. Yet, if faculty are not aware of these benefits to themselves personally, their institution, or their city and state, they likely will not see the value in pursuing this type of behavior.

### ***Knowledge of the Steps necessary to Engage in Entrepreneurial Risk-taking Behavior***

There are a number of approaches to entrepreneurial risk-taking behavior, some of which are highlighted earlier in this chapter. Van Dam et al. (2010) found that possessing the knowledge of behaviors that are involved in entrepreneurship enabled teachers to actually engage in these behaviors. Regardless of the approach, one key step toward entrepreneurial risk-taking behavior is for faculty to connect a research finding to a practical implication, which could be in the realm of business, nonprofit, or civic life, among others. This step is about utilizing the knowledge generated in the university setting. Goldstein and Glaser (2012) noted various ways that universities play a role in regional economic development. This includes the universities' role as

a generator of knowledge, which can be a source of increased competitiveness for the region. However, for the knowledge produced from the research function of a university to be an advantage, it must be connected to practical implications and commercialized (Urbano & Guerrero, 2013). Therefore, faculty must know how to take the next step to make their research findings usable outside of the university setting. The procedural knowledge of how to take their research and develop practical implications is an important pre-requisite for faculty to engage in entrepreneurial risk-taking behavior.

Another related step is to connect faculty with people and organizations external to the university to develop partnerships that help operationalize the research findings. Chrisman et al. (1995) noted that some of the biggest barriers to faculty engaging in entrepreneurship include a lack of capital, business experience, and market research. External partners can help faculty overcome these barriers. Because they often lack prior experience engaging in entrepreneurial behavior, many faculty members need to learn necessary skills to pursue entrepreneurial behavior. Without this knowledge, they may have ideas with no way to operationalize them, even if they have the motivation to do so. These are two of the most fundamental steps that would lead faculty toward a greater likelihood of pursuing entrepreneurial behavior.

### ***Knowledge of Self to Reflect on One's Own Effectiveness in Execution of this Behavior***

Anderson and Krathwohl (2001) highlighted that self-knowledge is a key element of metacognition. Particularly, these authors noted that individuals need to understand their own strengths and weaknesses as well as the strategies on which they are likely to rely. Applying this literature to the context of this study, faculty need the ability to recognize when their preferred strategy is not proving effective and alter their behavior in order to adapt to the best approach for

the particular situation. This ability to recognize one’s own limitations and adjust course leads to increased ability to reach a goal.

Table 2 presents each of these knowledge influences along with the category of knowledge in which they fall.

**Table 2**

*Assumed Knowledge Influences*

Assumed Knowledge Influence “Knowledge of...”	Knowledge Type
The potential benefits of engaging in entrepreneurship, such as significant personal economic benefits and contributing to regional economic development	Declarative (Conceptual)
The steps necessary to engage in entrepreneurial risk-taking behavior, including connecting scholarship to practical implications and building relationships with external partners	Procedural
How to self-reflect on his or her own effectiveness in execution of this behavior.	Metacognitive

**Motivation**

In addition to knowledge, motivation is the other psychological system that guides individual behavior (Clark & Estes, 2008). Schunk, Meece, and Pintrich (2014) identified three areas in which motivation influences behavior: active choice, persistence, and effort. Without motivation, faculty may know how to engage in entrepreneurial risk-taking behavior, but are unlikely to decide to pursue it, persist at it, or put in the necessary effort. Specifically, higher levels of perceived value are likely to motivate an individual to start an activity (Rueda, 2011). Therefore, faculty will likely not choose to pursue the behavior if they do not perceive any value in doing so or if they believe their professional standing in the university could be harmed if they do not succeed. Additionally, Bandura (1986) found that without adequate self-efficacy, the

belief that one can be successful in a task, he or she will likely not persist at that task through completion. Self-efficacy theory can be applied to faculty such that if they do not feel self-efficacious in entrepreneurial risk-taking efforts, they will likely not persist at it. This section further explains the underlying motivation influences on faculty likelihood to engage in entrepreneurial risk-taking behavior.

### ***Faculty Value Related to Engaging in Entrepreneurial Risk-taking Behavior***

Ambrose, Bridges, DiPietro, Lovett, and Norman (2010) noted that the importance of an activity to an individual is a critical element of motivation. In the case of this study, faculty need to understand the value of engaging in entrepreneurial risk-taking behavior in order to decide to pursue it, which is directly related to the knowledge influence regarding potential benefits of engaging in entrepreneurial behavior. Chrisman et al. (1995) found that monetary reward for faculty entrepreneurship can be quite significant, which could provide utility value for faculty. These authors also found that faculty entrepreneurship contributed to regional economic development, which could provide utility as well as other kinds of value, such as importance value. If faculty perceive the potential value associated with entrepreneurial risk-taking behavior, they are be more likely to decide to engage in it.

### ***Faculty Self-efficacy Related to Successfully Engaging in Entrepreneurial Risk-taking Behavior***

Rueda (2011) highlighted that self-efficacy is a particularly relevant motivational influence when individuals face difficulty engaging in an activity. If individuals do not believe that they will succeed at an activity, they are likely to stop engaging in it. In this way, self-efficacy impacts a person's likelihood to persist. Given the long-term and challenging nature of engaging in entrepreneurial risk-taking behavior, faculty need to believe that they can be



successful in order to continue to persist when they face challenges. Ambrose et al. (2010) related individuals' self-efficacy to whether or not they perceive their organization as supportive of the activity, such that a supportive environment leads to increased self-efficacy. While this study explores the role of the organization further in the next section, it ties into the overall research-based theory that individuals who feel they can be successful at an activity are likely to have higher motivation. Urbano and Guerrero (2013) supported self-efficacy theory specifically in relation to entrepreneurial behavior in a university setting by noting the importance of role models who have been successful and offer “‘possibility proof’ for the entire community” (p. 45).

#### ***Faculty Cost Value Related to the Effort Involved in Entrepreneurial Risk-taking Behavior***

As mentioned in the previous section, entrepreneurial risk-taking behavior is likely to require substantial time and energy on the part of the faculty member. Rueda (2011) called this time and energy required to pursue an activity the cost value of that activity, and that to increase the likelihood that someone is motivated to do an activity, the utility and importance value must be higher than the cost value of engaging in it. Therefore, faculty members must believe that the cost of time and energy to engage in entrepreneurial risk-taking behavior will be less than the expected value they will get out of it.

#### ***Faculty Cost Value Related to Professional Standing***

Another element of cost value in the case of this study is the perception that an unsuccessful attempt at entrepreneurial risk-taking behavior may impair the faculty member's professional standing, such as progress toward tenure. Similar to the cost value motivation influence above, faculty need to believe that the potential benefits outweigh the risk. If faculty have a minimal or non-existent perception that their professional standing is at risk based on the

outcomes of any entrepreneurial risk-taking behavior, even limited perceived value would outweigh the risk and lead to enhanced motivation to pursue such behavior.

To summarize all these motivational influences, Table 3 captures the assumed influences and associated constructs.

**Table 3**

*Assumed Motivation Influences*

Assumed Motivation Influence “Faculty need to...”	Motivation Construct
Perceive engaging in entrepreneurial risk-taking behavior as beneficial, such as potentially significant personal economic benefits and contributing the regional economic development.	Value (Utility, Attainment, and potentially other kinds)
Believe they are capable of being successful at effectively engaging in application of research to practice through entrepreneurial risk-taking behavior.	Self-Efficacy
Believe that engaging in entrepreneurial risk-taking behavior is worth the effort that it will take (i.e., perceived positive cost-benefit analysis).	Cost Value
Believe that their professional standing at the university, including progress toward tenure, will not be harmed by unsuccessful attempts at entrepreneurial risk-taking behavior.	Cost Value

**Organization**

While knowledge and motivation influences focus on the individual, the organizational context affects individuals’ knowledge and motivation. Research in behavioral theory found that altering the environment changes individuals’ behavior (Daly, 2010). Clark and Estes (2008) highlighted that assessment of organizational influences requires critical examination because people generally prefer to blame the organization for problems, rather than attribute the problems to their own lack of knowledge or motivation. However, these authors also noted that when the

data mentions a problem with organizational policies or resources, these are organizational influences. These organizational influences can be further classified into two categories, cultural models and cultural settings (Gallimore & Goldenberg, 2001). Cultural models include the intangible culture and norms that people internalize within an organizational context and that shaped their behavior. In contrast, cultural settings are the more concrete or tangible elements of an environment (Gallimore & Goldenberg, 2001). Regardless of whether an influence is a cultural model or setting, organizational influences are important to address for several reasons. First, the organization is generally the entity setting the goals and identifying the gaps, therefore the organization will likely be the entity to work to address the gaps in desired performance. Then, the organization can make changes that have widespread impact on the behavior of the individuals within the organization, and those individuals often need the support of the organization to address the gaps in performance.

### ***A Culture of Faculty Willingness to Take Risks***

The purpose of this study is to explore what would be needed to support the item in the N | 150 report that states that UNL will “support a campus-wide ethos of informed risk taking” as one of the ways in which UNL will fulfill its role as a driver of economic development in the state of Nebraska (University of Nebraska – Lincoln, 2018, p. 7). As noted in the Chapter 2, Urbano and Guerrero (2013) found that in an “entrepreneurial university” the attitudes of individuals across the university are favorable to entrepreneurship. Additionally, Chrisman et al. (1995) stated that a university culture that supports entrepreneurial behavior is critical. An organization can go about changing organizational models through using more tangible changes in organizational settings to influence more unconscious cultural elements. Therefore, the

organizational settings mentioned in later sections that are oriented toward openness to entrepreneurial risk-taking behavior may thereby affect the culture.

### ***A Culture of Trust to Take Risks***

This organizational influence is directly related to the cost value motivation influence that faculty need to believe that their professional standing at the university will not be harmed if they are to take risks and not be successful. Because the organizational culture impacts the individuals' beliefs and attitudes (Rueda, 2011), the organization must actively shape the culture to increase the likelihood that faculty believe they are safe to take risks without undue harm. Such a culture is likely to lead to increased motivation, which in turn is likely to lead to increased likelihood of faculty deciding to engage in entrepreneurial risk-taking behavior.

### ***Faculty Incentive Structure***

The faculty incentive structure is yet another step in the organization, motivation, behavior chain. Behavioral theory states that rewards and punishments influence behavior (Daly, 2010). Applied to this study, university policies that reward entrepreneurial risk-taking behavior may increase the likelihood that greater numbers of faculty would engage in this behavior. Sanberg et al. (2014) asserted that faculty incentives are often misaligned with use-oriented research and commercialization. This article advocated for career advancement policies to include recognition of activities such as patents, commercialization, and even impact of research. Additionally, Urbano and Guerrero (2013) highlighted that entrepreneurial universities have both monetary and non-monetary rewards to incentivize entrepreneurial behavior. The most comprehensive policies would include indicators of entrepreneurial risk-taking behavior in tenure and promotion decisions, which would lead to both financial and status rewards for those faculty who engage in the desired behaviors. Ensuring that tenure and promotion policies reward

entrepreneurial behavior is one significant way the university can send the message that the leadership values entrepreneurial risk-taking behavior and would likely increase the value for faculty members. Faculty will generally align their time and energy toward where it has the most value for them, therefore changing the policies may lead to faculty members re-prioritizing their time to include entrepreneurial activity.

### ***University-provided Resources and Support***

There are numerous ways that a university can offer resources and support for faculty who wish to engage in entrepreneurial risk-taking behavior. Chrisman et al. (1995) found that faculty usage of these resources was limited, but that these resources are still significant to fostering entrepreneurial behavior. One key resource is a program or center that helps faculty overcome the barriers related to the knowledge influences described earlier, such as helping faculty to actively connect with external partners and develop working agreements. These programs may also provide more concrete support, such as legal services to file patents, articles of incorporation, or other legal documentation. Additionally, these programs or centers may connect faculty with the tools or resources to overcome their lack of knowledge related to industry as described in the knowledge influence regarding the steps necessary for faculty to engage in entrepreneurial risk-taking behavior.

### ***University Promotion of Resources and Support***

Finally, the university can offer substantial resources and support to faculty to engage in entrepreneurial risk-taking behavior, but if the faculty do not know about these resources, they cannot engage with them. Promotion of these resources serves two purposes. First, it sends the message to faculty that the university leadership values entrepreneurial risk-taking behavior such that they are willing to allocate university resources to support faculty. Second, it lets faculty

know that the resources are available for their use, should they decide to pursue such behavior.

Table 4 displays a compilation of all of the organization influences mentioned in this section.

**Table 4**

*Assumed Organization Influences*

Assumed Organizational Influence “The university needs...”	Organization Construct
A culture of willingness among faculty to take risks through adopting new behavior.	Cultural Model Influence 1
A culture of trust between the administration and faculty, such that faculty feel comfortable engaging in this type of behavior without fear of diminished professional standing.	Cultural Model Influence 2
Faculty incentive structures that reward engagement in entrepreneurial risk-taking behavior through guidelines and criteria for tenure and promotion.	Cultural Setting Influence 1
Resources to support faculty engagement in entrepreneurial risk-taking behavior, such as connections to potential collaborations, mentorship and role models, and funding, among others.	Cultural Setting Influence 2
Communication and promotion of the services and resources it provides faculty to support entrepreneurial risk-taking behavior.	Cultural Setting Influence 3

**Conclusion**

The role of universities has evolved over the past decades, beginning with teaching and research to increasingly include service to society. Entrepreneurship is one approach to connect HEIs’ key asset – knowledge – to solutions outside of the university, thereby stimulating regional development. This incremental development is a part of the role of HEI fulfilling its service to society. Entrepreneurial endeavors can also create benefits for the university via enhanced reputation, increased relevance in society, and potential financial gain. “Academic entrepreneurship” as a concept has been gaining traction in the past decade, and scholars have

increasingly studied what makes a university entrepreneurial. Research from the business discipline can also inform HEIs' endeavors to create a culture that encourages innovation and entrepreneurship. Finally, the latter section of the chapter synthesized research from social science, business, and the academic disciplines to assess the assumed knowledge, motivation, and organization influences that will serve as the framework for inquiry throughout the research methodology and data analysis in this study.

## CHAPTER THREE: METHODS

The purpose of this study was to understand what would be required to increase entrepreneurial risk-taking behavior among the faculty at UNL to spur regional development in the state of Nebraska. This chapter lays out the research methodology designed to address the following research questions:

1. What are the knowledge, motivation, and organizational influences dimensions that enable some faculty to engage in entrepreneurial risk-taking behavior?
2. How can the knowledge, motivation, and organizational influences that support faculty engagement in entrepreneurial, risk-taking behavior be fostered to increase this UNL faculty behavior by 10%?

The following sections outline the various elements of data collection and analysis for this study. The chapter begins with a detailed description of the participant sampling strategy and rationale for both a survey and interviews. The chapter then goes into the specific data collection methods and instrumentation for this study. The following section outlines expected data analysis on the data collected through these instruments. A section on credibility and trustworthiness then lays out the various ways in which this methodology is designed to gather accurate and relevant data, and the ethics sections lays out how this study prioritizes treatment of the participants. Finally, the last section discusses the delimitations that bound this study as well as the study's limitations.

### **Participating Stakeholders**

Because my research questions focused on changing the behavior of faculty at UNL, the general stakeholder population of focus in this study was current tenured and tenure-track faculty at UNL, across all schools and disciplines. The goal was to study this group in order to better



understand why they do and do not decide to pursue entrepreneurial risk-taking behavior and what may increase their likelihood to do so.

### **Survey Sampling Criteria and Rationale**

#### ***Criterion 1***

The survey sample included all current, full-time faculty at UNL.

#### ***Criterion 2***

The survey sample included the approximately 1,100 tenured and tenure-track faculty only and excluded the approximately 575 special appointment faculty members.

### **Survey Sampling Strategy and Rationale**

I used a comprehensive sampling strategy and sent the survey to all UNL tenured and tenure-track faculty, making this a census rather than a survey (Johnson & Christensen, 2017). This means that I sought total population participation, approximately 1,100 faculty, who fit the criteria laid out above (University of Nebraska – Lincoln, 2019). This broad sample allowed for a picture of faculty perspectives across the university on the knowledge, motivation, and organization influences outlined in Chapter Two. Additionally, this relatively comprehensive set of criteria included both those who have and have not exhibited entrepreneurial or risk-taking behavior. Through asking whether or not faculty have engaged in this type of behavior on the survey, as well as questions pertaining to the assume knowledge, motivation, and organization influences, I was able to validate or invalidate the influences and better identify gaps.

The survey was administered before the interviews in the data collection process. The survey was open five weeks and aligned with when faculty were most likely to have availability to fill it out during the fall semester, beginning October 28, 2019. The final question on the survey asked participants if they would be willing to volunteer for an interview. This list of self-

identified volunteers was intended to be utilized as a back-up if the desired number of interviews is not attained as defined in the following section, but it was not needed.

### **Interview Sampling Criterion and Rationale**

#### ***Criterion 1***

All participants selected for this study were current faculty at UNL.

#### ***Criterion 2***

Participants were screened to purposively select faculty who have previously engaged in entrepreneurial risk-taking behavior as defined by this study.

### **Interview Sampling Strategy and Rationale**

For interviews, a collaborator who recently served in an executive leadership role at the university level and who has deep, institutional knowledge of UNL selected 13 faculty members based on the specific criteria listed above. This collaborator ensured alignment on qualities to look for in faculty who have exhibited entrepreneurial risk-taking behavior, which this study defines as, “a type of activity or practice with implications for generating jobs, fostering innovation and increasing productivity by means of which the creation of incomes and wealth is enhanced” (Ahwireng-Obeng, 1993, p. 151). Specifically, I worked with this collaborator to identify faculty who have engaged in connecting their work to practical applications outside of the university or creating a business venture or non-profit outside of the university. I also worked with this collaborator to seek faculty from across disciplines, to the extent possible. Overall, purposefully selecting faculty who exhibited the desired behavior in the past, whether they have been successful or not, led to more information-rich interviews (Merriam & Tisdell, 2016). I was able to interview 12 of the 13 faculty members selected by the collaborator.

I started with 12 participants in the sample, so that I confidently reached saturation of themes. While the number of participants to reach saturation of themes cannot be known beforehand (Merriam & Tisdell, 2016), past experience told me that I would likely reach that point before approximately 10 interviews total. I did hear repetition of information with my original sample and did not need to request additional introductions for interviews in order to reach saturation.

Recruitment began with an email from my collaborator to introduce me to the faculty member and explain the purpose of the study. I then followed-up with the faculty members with additional information and requested to schedule a time for an interview. I made every attempt to schedule these interviews in person during two periods of time when I traveled to Nebraska. I conducted 11 interviews in person and one interview by video due to the scheduling constraints of the faculty member. I completed the interviews during November and December 2019.

### **Data Collection and Instrumentation**

This section details how I collected the data for this study. I started by reviewing documents for context, conducted the survey next, and finished with interviews shortly thereafter. Each data collection method connected to the research questions and the conceptual framework. Each element in the survey and interview instruments derived directly from the knowledge, motivation, and organization influences outlined in Chapter 2.

For this study, I reviewed documents to provide context for the data collection and findings from the survey and interviews. I used the UNL website to acquire a baseline understanding of the resources and support that UNL offered regarding entrepreneurial risk-taking behavior in advance of the interviews to better understand participant responses and probe where appropriate. Additionally, the UNL website contained the current tenured and promotion

guidelines, which I downloaded and reviewed to provide context regarding the organization influence related to faculty incentive structures. These documents helped inform the portion of the research questions pertaining to organizational needs to support increased faculty entrepreneurial risk-taking behavior.

## **Surveys**

I administered the survey portion of this study online, via Qualtrics, an online survey software. I sent an introductory email containing a link to the survey to all tenured and tenure-track from the leadership at UNL. I was unable to get an official faculty list from UNL administration, so I compiled the list based on publicly available resources online. The survey was open for five weeks, and I sent two reminder emails during that period to encourage a higher response rate.

I created the survey instrument format based on literature guiding effective survey writing (Robinson & Leonard, 2019). The survey instrument contained 19 items related directly to the knowledge, motivation, and organization conceptual framework, including 15 closed-ended and four open-ended items that were voluntary. Additionally, the survey included one question regarding willingness to volunteer, and four demographic questions. The demographic questions included current title, college affiliation, number of years of employment at UNL, and gender. The instrument contained three items related to the three factual and procedural knowledge influences, using a “select all that apply” response format. The motivation influence related to value used a ranking response format. And remaining items covering the motivation influences as well as all the organization influences used a six-point Likert scale response format. The survey did not collect data related to the metacognitive knowledge element, as surveys are

not effective means to measure this element. Appendix A includes the survey instrument designed for this study.

I increased the reliability and validity of the survey through a number of approaches. Each knowledge, motivation, and organization influence had more than one item to increase reliability. The clarity and focus of each item also ensured that the survey is closely aligned with the conceptual elements I examined. I worked to achieve content validity through ensuring that the survey reflected prior research conducted on the topic, which I explored in the literature review. Overall, I worked with my dissertation committee chair and a faculty advisor at USC who is an expert on the content to utilize their expertise to help achieve validity.

## **Interviews**

Interviews served an important role in data collection to get deeper information regarding faculty members' perspectives on entrepreneurial risk-taking behavior in the UNL setting. Specifically, due to its long-term nature, I could not observe entrepreneurial risk-taking behavior in the course of this study. Therefore, interviewing was required to better understand the faculty members' points of view (Merriam & Tisdell, 2016). My goal was to conduct 12 one-on-one interviews. Due to the time constraints of this study, I conducted one interview with each participant. I scheduled the hour-long interviews over a time period in the fall and traveled to Lincoln, Nebraska to conduct them in person. Only one participant was not available during that period, so I used video conferencing to conduct that interview.

For the in-person interviews, I worked with a UNL staff member to set up a private room to conduct the sessions. The interviews lasted up to an hour in duration. I conducted the interviews myself, which meant that I am inherently part of the research instrument and data collection. I conducted semi-structured interviews based on an interview protocol, which allowed

me to explore answers to my research questions while also allowing open-ended exploration into the faculty members' unique perspectives on the topic, seeking richer information (Merriam & Tisdell, 2016). I probed topics when I did not fully understand the participant's response and in situations where it seemed the participant has more depth to share. I conducted a pilot interview with a staff member from a different university who is not a part of this study to test the instrument questions in advance and make edits in an attempt to get the most rich data from the participants in this study. Each of these elements laid out are based on the guidance of Merriam and Tisdell (2016) regarding conducting effective interviews.

This interview protocol included 13 questions directly related to the knowledge, motivation, and organization influences. These questions combined four of Patton's (2002) six question types, including experience and behavior questions, opinion and value questions, feeling questions, and knowledge questions. Appendix B includes the interview protocol designed for this study. I gathered background and demographic data on the participant via their biography on the internet, and only asked clarifying questions regarding this information if needed. However, I began the interview with a general, descriptive question. Merriam and Tisdell (2016) noted that this approach is effective to aid the recall and set the frame of mind for the participant in the interview.

### **Data Analysis**

For survey responses, I calculated descriptive statistics after the survey closed and all responses were finalized. I calculated frequencies and percentages for questions with a multiple-choice selection response format. For all questions that utilized a Likert scale response format, I calculated the mean and standard deviation to analyze averages among the items. For the two questions that asked participants to select all items that apply, I analyzed how often each choice

was selected. I coded the responses to the four open-ended survey questions using the same coding process described below for interviews.

I began data analysis for the interviews during the data collection phase. After each day of interviews, I re-read my notes and wrote analytic memos to capture themes, emergent observations, and initial conclusions from the data. In this way, I had a process to methodically link my data collection and analysis to the research questions and conceptual framework. At the end of each day of conducting interviews, I sent the interview recordings to be professionally transcribed.

After receiving the transcriptions and returning from traveling to conduct the interviews, I began the process of coding the interviews. While I read and coded each interview transcript manually, I used Atlas.ti software to help me organize and keep track of the codes across the transcripts. Initially, I used open coding, utilizing both a priori codes based on the conceptual framework as well as looking for empirical codes in the data. For the second level of coding, I categorized these open codes into analytic codes. In the third phase, I identified patterns and themes, based on the analytic codes and using my conceptual framework and research questions to guide the analysis. These patterns and themes directly led to the findings and assertions in Chapter Four.

Recognizing that I am inherently biased as the human researcher, I incorporated a number of analytical tools into my data analysis process in order to distance myself from and more deeply analyze the data. In addition to this distance, analytical tools have the benefit of inducing new ways of thinking about the data to reveal novel findings (Corbin & Strauss, 2008). Asking questions of the data helped me to get started digging into the data on a deeper level than simply reading what the participants said. This tool helped me mentally probe what the participants

meant. I also looked for emotions in the data and what topics brought on these emotions. Given that entrepreneurial behavior is inherently risky, emotions such as fear or exhilaration are examples of what arose. Finally, I looked throughout the data for the negative case, or an experience that does not fit the others. Understanding areas of difference helped uncover alternative hypotheses or new facets in the data (Corbin & Strauss, 2008).

### **Validity and Reliability**

I used the information from the survey to triangulate the data in the interviews, as well as understand the more widespread trends across the faculty at UNL. In these ways, I utilized the survey data in conjunction with the data from the interviews to validate the gaps in what the participants reveal as important to support entrepreneurial risk-taking behavior and what the general faculty population experienced in terms of knowledge, motivation, and organizational factors.

In addition, I worked to ensure the accuracy and relevance of the data and findings of the quantitative portion of this study through various methods. As mentioned in the Data Collection and Instrumentation section, I worked to achieve a strong response rate by sending a reminder email halfway through the three-week survey window. The online data collection method and the limited number of questions also increased the response rate. After the survey is closed, I ran descriptive statistics on the respondent demographics to verify the representative nature of the sample. Chapter 4 provides an overview of these demographics. I encouraged truthfulness from the respondents through offering anonymity in their responses. I reduced confusion through the simple format of the survey, with only a few question types, and all Likert scale questions using the same scale.



## **Credibility and Trustworthiness**

Throughout this study, I used a variety of approaches to increase the credibility and trustworthiness of the data and research findings. Maxwell (2013) noted that bias is inherent in qualitative research, and he lists a number of methods to minimize bias. As the researcher, I recognized that I had inherent bias based on my background in business, and that I had a generally positive perspective on entrepreneurial risk-taking behavior in universities. As such, I was reflective of this position and careful to re-read my data and findings with a critical lens, searching for where this bias may have arisen. I used triangulation between the different data collection methods to reduce the potential bias inherent in any one data collection method. I also used triangulation amidst the interview data, looking for any discrepant evidence across the accounts of the interviewees.

Finally, due to my background in business and personal relationships, I recognized that I had an inherent bias that entrepreneurship and innovation generally have a positive influence on an institution. Also, because the desire to create an “ethos of informed risk-taking” comes directly from UNL’s strategic plan, I was generally accepting the strategic planning process and trusting that this ethos would be positive for the UNL community overall. I made every effort to be cognizant of this bias when interacting with participants, especially those participants who may not believe that the university should encourage entrepreneurial risk-taking behavior, and worked to avoid visible signs of judgement related to their attitudes or beliefs.

## **Ethics**

I had no prior relationship with UNL as an institution nor the participants of this study. I had no power or authority over the faculty at UNL in general nor the participants of this study.

However, I did receive minimal assistance from university staff, including those in the Provost's Office.

A key component of ethical research is gaining informed consent (Rubin & Rubin, 2012). I asked for and received verbal consent from all interview participants after going through the Information Sheet. This sheet notified the faculty participants about the purpose of this research, that their participation was voluntary, and that they were able to withdraw at any time without penalty. The sheet also informed faculty participants that they would not receive any compensation for participating in the study. The sheet included my contact information as well as Institutional Review Board (IRB) contact information in case the participant had any concerns in the future. Appendix C contains the information sheet used for this study.

During this consent process, I also asked for participant consent to record. I recorded the interviews for accuracy and credibility of the data. To protect the data and the participants, I transferred the recordings from my table to my computer as soon as possible. I kept the recordings on my password protected computer, did not share them, and deleted them after I successfully defended my dissertation and graduated. To protect their confidentiality, I created pseudonyms for each interview participant, and did not attach their real names to any quotations that I used. Because I only interviewed 12 participants, some anecdotes may make it clear with whom I spoke, though I made every effort to de-identify them with the use of pseudonyms and not using identifiable characteristics in reporting. In these ways, I seriously adhered to the principle of avoiding harm to participants (Glesne, 2011; Rubin & Rubin, 2012).

### **Limitations and Delimitations**

One key limitation of this study was which faculty members chose to complete the survey and participate in interviews, which created an inherent bias in the data. Additionally, because

the survey and interviews collected self-reported data, the data was shaped by the awareness of the individual and their honesty regarding the context and their own knowledge and motivation. While these elements were generally outside of my control, the sections regarding credibility and trustworthiness, as well as reliability and validity, outline the steps I took to minimize these limitations.

I initially delimited this study to tenured and tenure-track faculty at UNL, which means that this study will not reveal the voices of the adjunct faculty and staff. However, interview participants did include Professors of Practice. While this creates a discrepancy, these non-tenured faculty provided information-rich data with bearing on the findings. I defined entrepreneurship and risk-taking behavior by faculty broadly in this study, including activity beyond the traditional definition of entrepreneurship that primarily includes tech transfer and spinoffs. However, I bounded this study to include only faculty behavior applying their research to practical implications toward the end of regional development, and not included their behavior as it relates to using entrepreneurship in the curriculum or risk-taking behavior within the university setting that will not be applied outside of the university. These delimitations were reflected in the assumed knowledge, motivation, and organization influences that I identified for this study, as well as the methodology.

## CHAPTER FOUR: FINDINGS

The purpose of this chapter is to report the findings from the interviews and surveys outlined in the last chapter. This study collected qualitative data via 12 interviews conducted on campus at UNL, as well as 1,476 surveys. Data were coded and analyzed to identify faculty knowledge, motivation, and organizational influences that impacted faculty participants' entrepreneurial, risk-taking behavior. The survey data was then assessed and used along with the interview data to identify key themes.

In this chapter, the findings are organized by theme and based on the knowledge, motivation, and organization conceptual framework used throughout this study. Because this is an innovation study, assumed influences were validated when there was evidence that changes need to occur in the future to achieve the stakeholder goal. Influences were not validated when there was evidence that the influence was already supported among faculty at UNL. Therefore, UNL would not need to make substantial changes to these influences to achieve the stakeholder goal of 10% increase in faculty who engage in entrepreneurial, risk-taking behavior. If the data related to an influence was neither strongly positive nor negative, the influence was partially validated, indicating that innovation or an intervention related to this influence could increase faculty engagement in entrepreneurial, risk-taking behavior. This chapter presents survey and interview results together to report key themes that emerged from the data as they relate to the research questions. As stated in Chapter 1, the research questions that guided this study include:

1. What are the knowledge, motivation, and organizational influences that enable some faculty to engage in entrepreneurial risk-taking behavior?

2. How can the knowledge, motivation, and organizational influences that support faculty engagement in entrepreneurial, risk-taking behavior be fostered to increase this UNL faculty behavior by 10%?

Overall, the data indicated that changes to organizational influences to remove organizational barriers to faculty engagement in entrepreneurial, risk-taking activity, would be the first and most effective step to changing faculty behavior. Specifically, altering faculty tenure and promotion incentives and time allocations would influence faculty motivation to engage in such behavior. Additionally, improving resources to support faculty who want to engage in entrepreneurial behavior can help overcome the validated need for faculty procedural knowledge regarding how to go about engaging in such behavior. Generally, interview participants believed there was a cadre of faculty interested in engaging in entrepreneurial, risk-taking behavior, and that organizational changes would encourage many of them to do so. Then, hiring for people who are inclined toward this type of activity would be the next, longer-term step to further increase faculty behavior. At the same time, many participants recognized that while it is desirable to create a campus-wide “ethos of informed risk-taking,” these activities will always be limited to a subset of faculty, and not applicable across all faculty.

## **Participating Stakeholders**

### **Interview Participants**

A collaborator with deep, institution-wide knowledge of UNL contacted 13 faculty members that they believed had exhibited entrepreneurial, risk-taking behavior. Twelve of these faculty members agreed to participate. Interview participants represented six different academic departments, including biochemistry, journalism, business, computer science, journalism, and arts. Eight interview participants were male; four were female. Six interview participants were

tenured or tenure-track faculty and five were Professors of Practice. Table 5 displays interview participants' pseudonyms and faculty rank to help keep their identities confidential.

**Table 5**

*Interview participants (n = 12)*

Pseudonym	Faculty Rank
Charles Pickering	Professor
Elizabeth O'Leary	Professor
David Hunt	Professor
Wendell Qin	Professor
William Brown	Professor
James Lehrer	Professor
Josh Gibbons	Professor of Practice
Samuel Lyon	Professor of Practice
John Santos	Associate Professor of Practice
Susan Baker	Assistant Professor of Practice
Molly Jones	Assistant Professor of Practice
Taylor Harris	Other

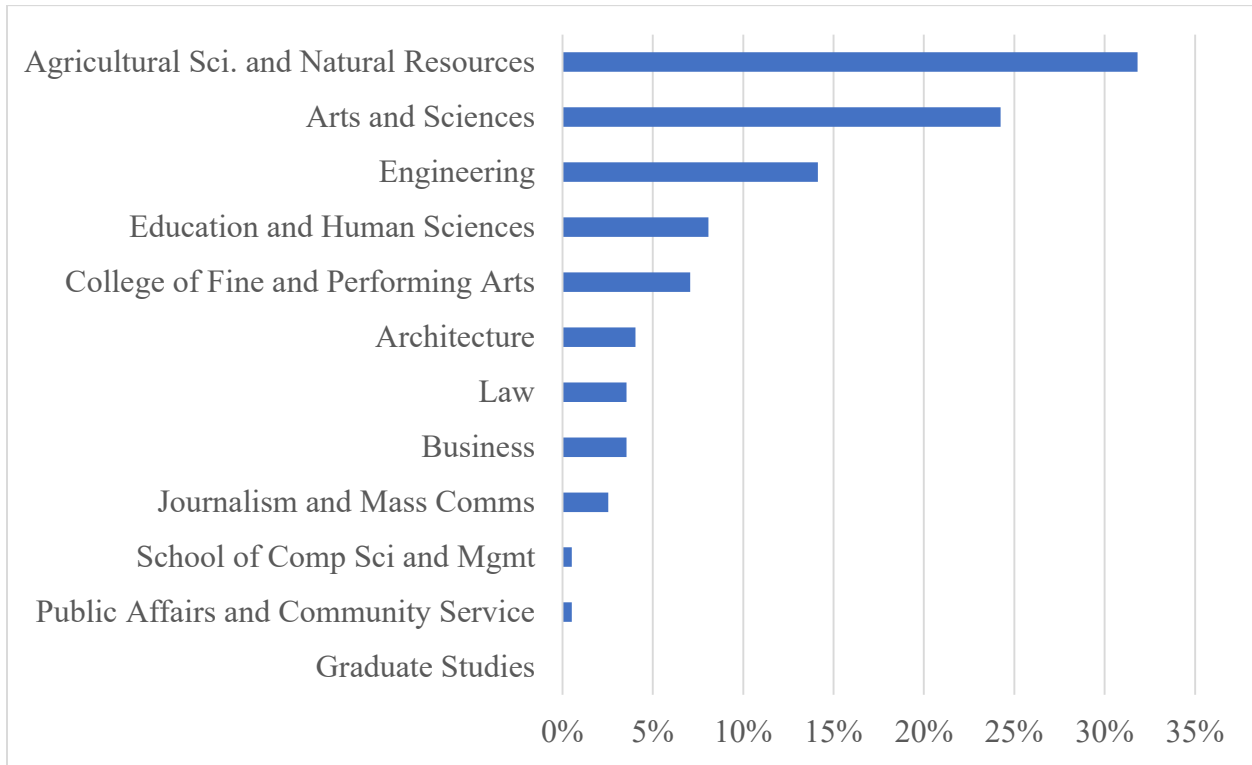
Ten interview participants engaged in behaviors that fall into the entrepreneurial, risk-taking definition used in this study. The other two participants were faculty members within the Center for Entrepreneurship, UNL's primary resource on campus to support this type of behavior. In this way, the faculty members interviewed represent outliers among faculty who engage in or interact with faculty who engage in this behavior already. The purpose was to better understand why and how they engage in this behavior and how those learnings may be applied to other faculty members to achieve the goal of 10% increase in the number of faculty who engage in entrepreneurial, risk-taking activities.

## Survey Participants

The survey email went to 1,476 email addresses. The list of email addresses was compiled via public sources online due to the lack of direct access from the university, and the actual number of tenure and tenure-track faculty was 1,100, so the list may have had invalid additions. To address this discrepancy, surveys for respondents that did not fit the desired criteria in the demographic questions were terminated. There were 198 tenured and tenure-track faculty members who participated in the survey, while 164 completed it. This represents an 11% completion rate. Respondents reported an average of 13.5 years of employment at UNL, with a mean of 11 years and range of less than one to 44 years. This expansive range reflects participation across newer and longer-standing faculty, also likely spanning a wide age range. Participants were 65% male, 34% female, and 1% nonbinary. In this way, respondent gender demographics closely represented the actual split between male and female tenured and tenure-track faculty at UNL, which was 67% and 33% respectively in the fall of 2019 (UNL, 2019). Participants represented 11 of the 12 colleges, as shown in Figure 1.

**Figure 1**

*Survey Participants by College*



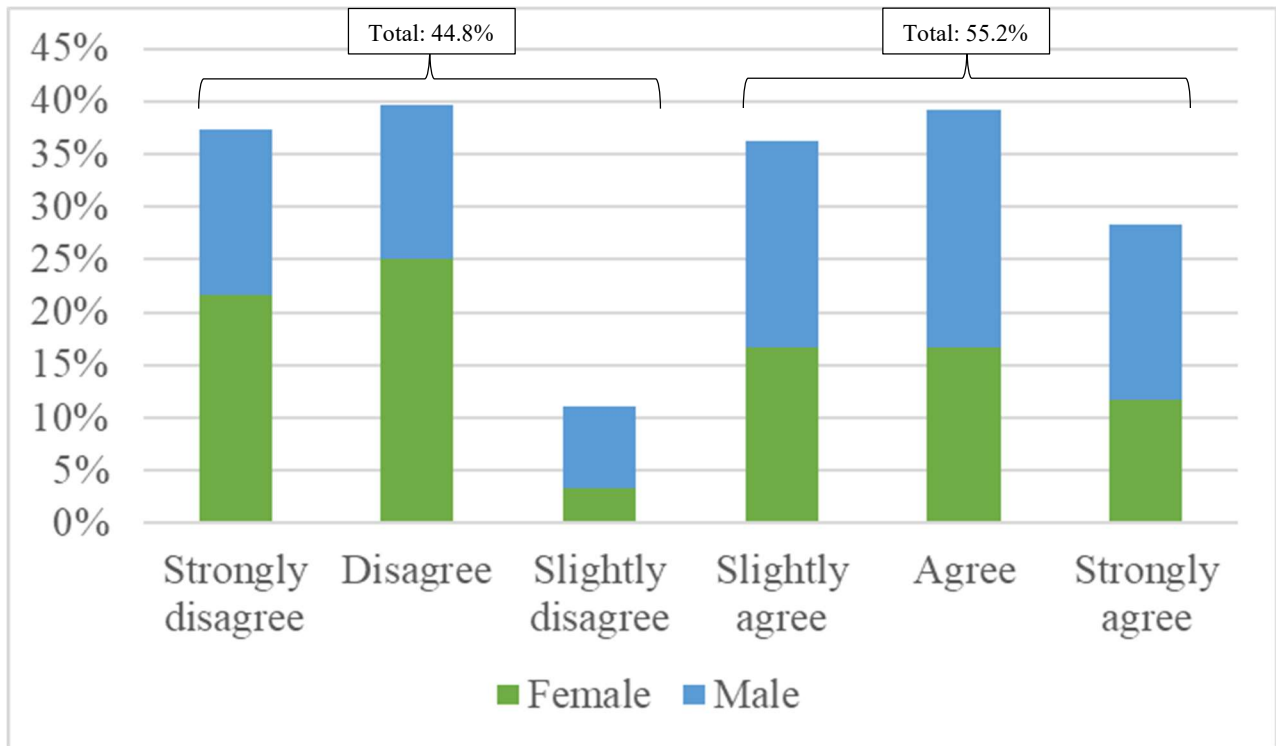
The survey included a filtering question to understand the proportion of faculty respondents who have previously engaged in entrepreneurial, risk-taking behavior as defined by this study. Using a Likert scale of 1 to 6 from “strongly disagree” to “strongly agree,” in response to the statement “I have engaged in entrepreneurial activity as defined by this study,” the participant average was 3.51 (n=172, standard deviation=1.74), as shown by Figure 1. Figure 2 also illustrates the breakdown of respondents by gender.



**Figure 2**

*I have Engaged in Entrepreneurial Activity as Defined by This Study*

Mean: 3.51  
Std.D: 1.74



These results indicate that participants were relatively evenly split between those who self-report that they have engaged in entrepreneurial behavior and those who have not. The results of this survey item were also useful to filter additional survey items to understand differences between those faculty respondents who engaged in this type of behavior.

### Findings

The data validated five and partially validated three out of 12 *a priori* influences; validated and partially validated influences will require innovation to accomplish the stakeholder goal. Additionally, two emergent themes arose from data analysis that span across the knowledge, motivation, and organization categories. Table 6 summarizes the *a priori* influences discussed in Chapter 2 and the two emergent themes, along with their validation status.

**Table 6***Influences and validation status*

<b>Gap Analysis Component</b>	<b>Validated</b>	<b>Partially validated</b>	<b>Not Validated</b>	<b>Assumed Influence</b>
Knowledge			X	The potential benefits of engaging in entrepreneurship, such as significant personal economic benefits and contributing to regional economic development.
	X			The steps necessary to engage in entrepreneurial risk-taking behavior, including connecting scholarship to practical implications and building relationships with external partners.
			X	How to self-reflect on his or her own effectiveness in execution of this behavior.
Motivation “Faculty need to...”	X			Faculty perceive engaging in entrepreneurial risk-taking behavior as beneficial, such as potentially significant personal economic benefits and contributing the regional economic development.
			X	Faculty believe they are capable of being successful at effectively engaging in application of research to practice through entrepreneurial risk-taking behavior.
			X	Faculty believe that engaging in entrepreneurial risk-taking behavior is worth the effort that it will take (i.e., perceived positive cost-benefit analysis).
			X	Faculty believe that their professional standing at the university, including progress toward tenure, will not be harmed by unsuccessful attempts at entrepreneurial risk-taking behavior.
Organization “The university needs...”	X			A culture of willingness among faculty to take risks through adopting new behavior.
			X	A culture of trust between the administration and faculty, such that faculty feel comfortable engaging in this type of behavior without fear of diminished professional standing.
	X			Faculty incentive structures that reward engagement in entrepreneurial risk-taking behavior through guidelines and criteria for tenure and promotion.
	X			Resources to support faculty engagement in entrepreneurial risk-taking behavior, such as connections to potential collaborations, mentorship and role models, and funding, among others.
			X	Communication and promotion of the services and resources it provides faculty to support entrepreneurial risk-taking behavior.
Emergent influences	X			The university needs to hire people inclined to engage in this behavior.
	X			NUtech needs to be considered a resource, rather than a barrier.

## **Knowledge Findings**

As discussed in Chapter 2, knowledge influences were categorized using Krathwohl's (2002) classifications, including factual, conceptual, procedural, and metacognitive elements. The three assumed influences correspond with the latter three types of knowledge: conceptual knowledge of the benefits, procedural knowledge of how to go about entrepreneurial, risk-taking activity, and metacognitive knowledge to reflect on and adjust one's efforts as needed. In general, that data indicated that faculty possess the conceptual and metacognitive knowledge needed; therefore, these influences do not require change and were not validated. However, the data indicated that faculty lack the procedural knowledge, as well as the skills necessary to execute on the action steps required, so this influence was validated as requiring change to achieve the stakeholder goal.

### ***Conceptual Knowledge of the Benefits of Entrepreneurial Behavior***

Overall, data show that faculty conceptually know about the potential benefits associated with entrepreneurial, risk-taking behavior. Therefore, the need for change associated with this influence to achieve the stakeholder goal was not invalidated. Interview participants highlighted a range of benefits of engaging in entrepreneurial behavior, indicating that they understand this can have broad impact. Some benefits noted by interview participants included those accrued to themselves individually, such as personal interest and advancing their work, ideas and research. Interview participant Wendell Qin said, "I am a better engineer because of it. Then that's a benefit." Interview participants also underscored benefits to their students through enhanced learning experiences, the ability to work on real-world problems, and connection to jobs. William Brown explained, "The benefits to faculty are also the benefits to their students, which is they're working on real problems... starting early with getting them to learn what the problems

are and learn how to start solving them.” Interview participants also reported benefits to the university’s reputation, relevance, and fulfillment of the land grant mission. These findings reflect ideas from Christensen and Eyring (2022), who wrote that HEIs are no longer offering what people find valuable. Layne and Lake (2015) also wrote about how HEIs are challenged to explain how their educational offerings and degrees are relevant. Interview participant James Lehrer said,

That's actually one of our motives... to enhance the reputation of the university in the community. We want people thinking when they need an unbiased stack of research, to come to UNL. So, definitely enhancing the name of the university throughout the state is part of our ethos when we're developing [this type of work].

Interview participants also noted benefits to the state or region through economic advancement, job creation, and community engagement. These findings mirror much of the research regarding the role of universities in fostering regional development, including Birch’s (1987) assertion that HEIs, especially research universities, provide a local resource for innovation, which is useful in a knowledge-based economy. At UNL, Charles Pickering talked about his own entrepreneurial endeavor by explaining, “And here in Nebraska...our goal is to build something that is big enough that we now have 30, 40 people that now work for a company.” The survey results corroborated the finding that faculty know about a range of potential benefits. In the survey item that asked faculty to select the benefits that they see associated with engaging with entrepreneurial activity, faculty respondents each selected 3.08 benefits on average. This mean indicates that faculty conceptually linked multiple benefits with this behavior (see Figure 5 in the motivation section for the benefits selected). While the data showed that most faculty know

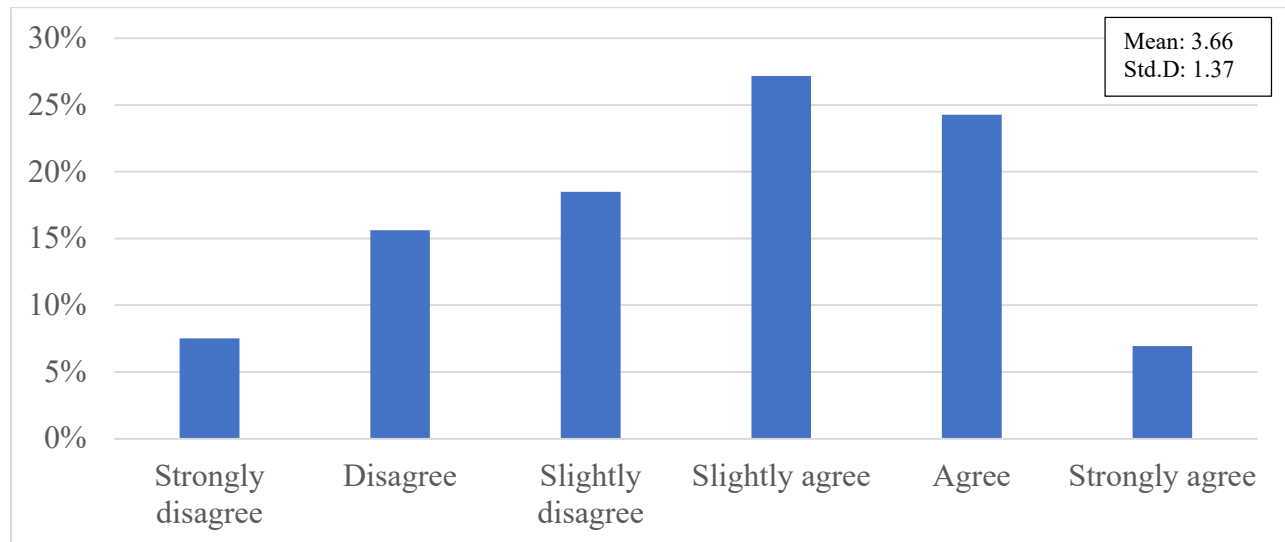
about the benefits, the benefits that motivate them were different between those who do exhibit this behavior and those who do not, a finding explained further in the motivation section.

***Lack of Procedural Knowledge for the Necessary Steps to Engage in Entrepreneurial Activity***

The need for additional procedural knowledge to engage in entrepreneurial, risk-taking activities was validated. The steps necessary to engage in this type of behavior were generally not clear to faculty. Interview participants who had engaged in this behavior reported a range of different steps, though no two interviewees had the same overall procedure. Interview participants reported an idea or exploration phase, following by a connection phase that includes networking and finding partners. They also highlighted the need to determine the path they want to take to apply their research outside of the university, but noted they had to learn these paths on their own. Finally, interview participants reported engaging in several business-related steps such as patenting, licensing, and attracting funding, among others, but said that generally faculty do not know how to do these things. These findings corroborate a study by Khorrami et al. (2018), which reported that educators' lack of knowledge regarding entrepreneurship creates uncertainty, and ultimately acts as a barrier to their being entrepreneurs. Susan Baker said that faculty are generally "...wrapped up in the whole idea of what they've produced, and not thinking ahead to the commercialization of the idea to launch... they have zero clue about what was to be the next step." The survey data triangulated the interview data: 31.2% of interview participants agreed or strongly agreed that they understood the steps necessary to engage in entrepreneurial activity, as illustrated in Figure 3 below.

**Figure 3**

*I Understand the Steps Necessary for Me to Engage in Entrepreneurial Activity*



One emergent theme related to this influence was the skills needed to engage in each of these steps. Susan Baker noted that faculty could collaborate with external partners who had the skills that they lack, saying,

There's some things that you can look to others to help you with. You don't necessarily need to be good with the finances. Find someone else to do that. You don't have to be a good salesperson, again, you find partners who can do it.

Other interview participants believed that faculty needed to learn basic industry skills, such as sales. As David Hunt said,

We have to push our idea. We have to communicate with our potential customers... One thing, I think we need to learn how to do sales talk, because it's not a confrontation...how to make a pitch in a very simple and short way, so can we show off our skills, solutions, technology in one or two minutes because no one wants to listen to us for 10 minutes.

Interview participants overall reported that, through their individual doctoral work in pursuit of a Ph.D., faculty simply do not gain experience with the skills needed in industry, which was why

they do not possess them naturally. Therefore, in addition to the knowledge of the steps necessary to engage in entrepreneurial, risk-taking behavior, faculty need to gain the knowledge of how to engage in these steps.

***Metacognitive Ability to Reflect on One's Effectiveness While Pursuing Entrepreneurial, Risk-taking Behavior***

The data indicated that faculty believe they have the metacognitive ability to engage in entrepreneurial, risk-taking behavior. Therefore, this influence was invalidated. One interview participant stated that he had no issues with changing course and adjusting when problems came up. Interview participants reflected on their metacognitive abilities in various ways. Three interview participants reported on their ability to recognize when they have an idea worth pursuing. Two participants noted the metacognitive ability to identify their own strengths, and then partnering with others to fill in the areas that they are less strong, as indicated by the quote from Susan Baker in the previous section. Almost all interview participants also recognized that engaging in this type of behavior is hard work and roadblocks will come up. Wendell Qin stated, "I don't know that I can be successful. If you look at the numbers, the odds are not in our favor." Yet, Wendell Qin was also the faculty member most noted by other interview participants as a success story, and he had received the "Innovator of the Year" award, indicating that he recognized how hard it is, and chose to do it anyway. Participants also talked about persistence and resetting after setbacks. As William Brown recounted,

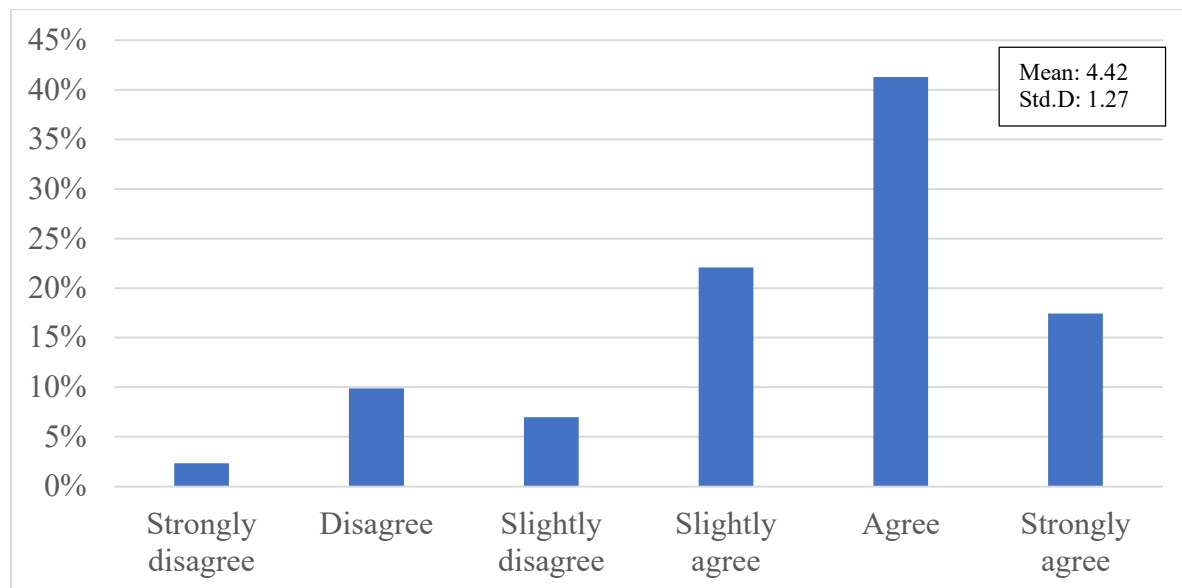
One part of the [entrepreneurial] lifecycle is you think you're on the same page, and then you find out you're not. How do you reset? Sometimes you find, "I thought I was communicating clearly, but I wasn't," or they didn't understand. And sometimes you find you have to just do some reset work, reeducation. But you've got to be able to adjust and

say, "Well, this wasn't a failure." See, and that's the problem, I think people will immediately say, "Oh, my god. I've spent six months on this, and now it's six months wasted, and I've failed at this." Neither is true. It's not wasted time, and you haven't failed.

The survey data similarly indicated that faculty felt they could generally figure out how to apply their research to practical solutions even when it proves difficult, with 80.8% agreeing to some extent, as shown in Figure 4.

**Figure 4**

*When it Proves Difficult to Apply My Research to Practical Solutions, I Can Figure Out How To Do It*



In this case, the interview data and survey data converge and together illustrate that metacognitive ability was not a barrier to faculty engagement in entrepreneurial activity.

### ***Summary of Knowledge Findings***

Faculty participants – both interview and survey – identified numerous benefits associated with entrepreneurial, risk-taking activity, indicating that they have the conceptual



knowledge of these benefits. The motivation findings explore further how these benefits impact individual behavior. Additionally, faculty generally feel confident in their ability to self-reflect and adjust course in the midst of an entrepreneurial endeavor, should they choose.

**Table 7**

*Assumed Knowledge Influences and validation status*

Assumed Knowledge Influence "Knowledge of..."	Validated	Partially validated	Not validated
The potential benefits of engaging in entrepreneurship, such as significant personal economic benefits and contributing to regional economic development			X
The steps necessary to engage in entrepreneurial risk-taking behavior, including connecting scholarship to practical implications and building relationships with external partners	X		
How to self-reflect on his or her own effectiveness in execution of this behavior.			X

Therefore, the one knowledge influence that would need to be addressed to change faculty behavior going forward to achieve the stakeholder goal would be procedural knowledge to engage in such behavior. The procedural knowledge required includes both understanding the steps necessary and acquiring the skills to effectively take those steps.

### **Motivation Findings**

The motivation influences laid out in Chapter Two represent the value, self-efficacy, and cost value constructs that affect motivation. Without perceiving the benefits as greater than the costs and without the belief that they can be successful, it is unlikely that faculty will choose to pursue, persist, or put in the effort required for entrepreneurial, risk-taking activity. The data indicated that intrinsic motivation constructs were more of a driving force toward action than the external benefit of financial gain. Generally, faculty identify feeling self-efficacious in risk-

taking behavior, so this influence was not validated as requiring change to achieve the stakeholder goal. When thinking about barriers to entrepreneurial behavior, faculty identified time as the greatest cost to engaging in entrepreneurial activity, along with a number of other barriers. However, faculty did not perceive risk to their reputation as a key barrier to motivation, thereby not validating this influence. Overall, it seems that the benefits were known and can be motivating, but barriers need to be reduced to encourage additional faculty to engage in such behavior.

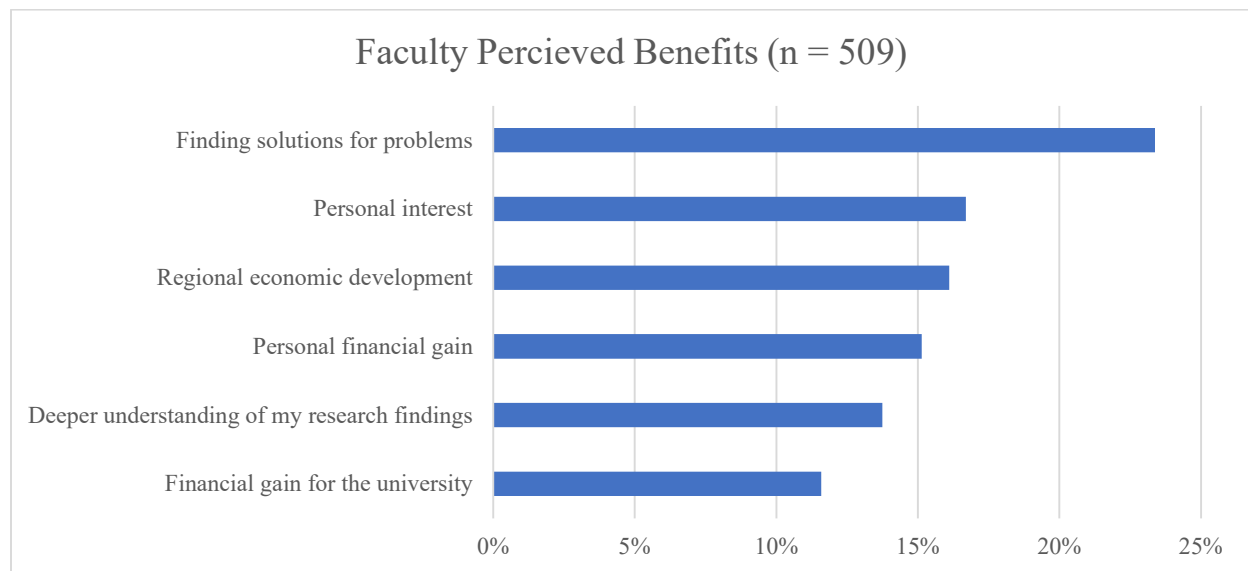
### ***Connecting Perceived Benefits to Motivation***

While the knowledge data showed that faculty have the conceptual knowledge of potential benefits associated with entrepreneurial, risk-taking behavior, the data also indicated that the intrinsic benefits motivate a faculty member to engage in entrepreneurial behavior more than extrinsic benefits. Therefore, the influence regarding perceiving this behavior as beneficial was validated. Throughout the interviews, those faculty members who had engaged in entrepreneurial or risk-taking behavior were most likely to talk about benefits rooted in helping others and advancing science. One interview participant, Elizabeth O’Leary, responded when asked about the benefits to engaging in such activity, “It’s the purpose of science, to benefit mankind and the human condition.” Interview participants also noted the personal fulfillment associated with this type of work, including the satisfaction of taking on new challenges, pride, and personal interest. Six interview participants said that entrepreneurial, risk-taking behavior could benefit the university’s reputation and relevance as well as fulfill UNL’s land grant mission and advance development in Nebraska. Josh Gibbons stated about his activities, “I believe fiercely in the land grant mission... I believe strongly in our role of giving this knowledge that we develop here back to the citizens of the state.” The survey data supported

these primary motivations. The top three benefits most selected by survey respondents were finding solutions for problems, personal interest, and regional economic development, which aligned clearly with the interview data. Figure 5 shows 509 responses because the question asked participants to “select all that apply.”

**Figure 5**

*Faculty Perceived Benefits Associated with Entrepreneurial, Risk-Taking Behavior*

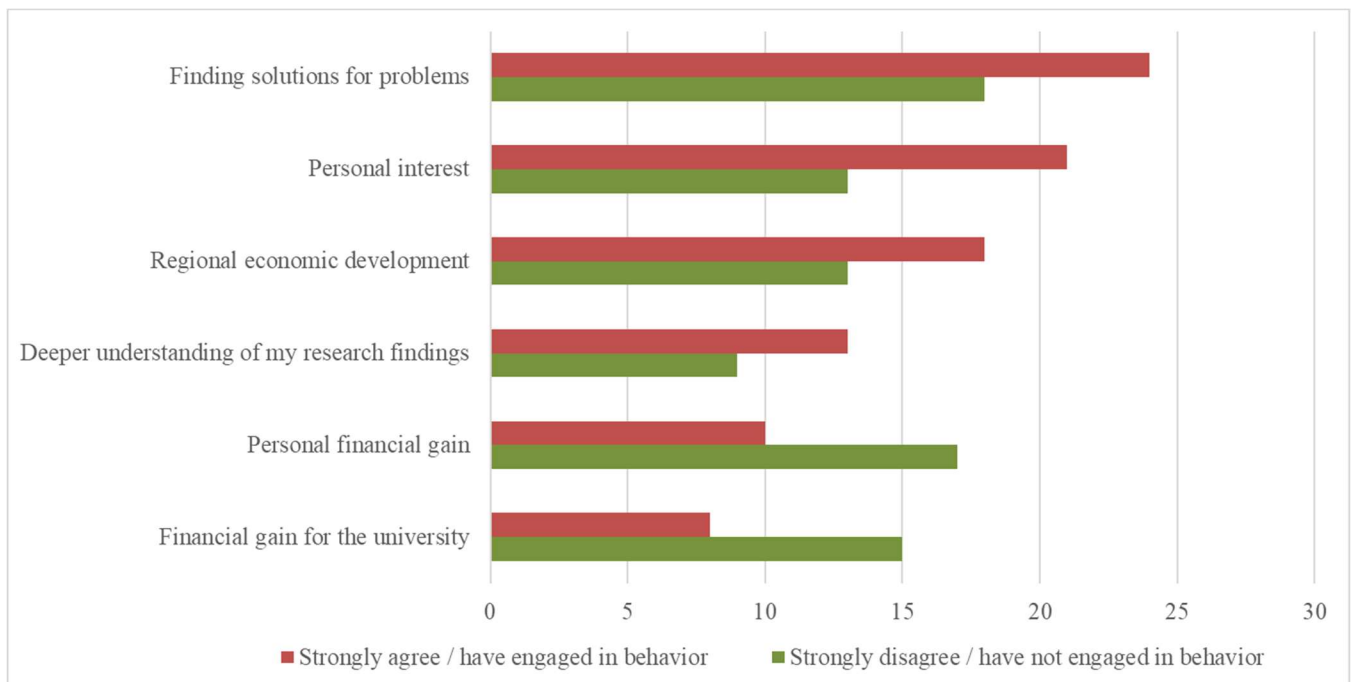


The benefits that actually motivate faculty to engage in such behavior were the intrinsic benefits, rather than the extrinsic benefits. Interview participants who had participated in entrepreneurial, risk-taking behavior did not indicate that financial gain was a perceived benefit for them. They generally did not mention financial benefit initially, and when asked about financial gain, tended to dismiss it as a perceived benefit but not one they cared about. As Elizabeth O’Leary stated in an interview, “I did not go into it to provide financial gain for the university. And I figured that financial gain for myself was probably a far shot.” However, interview and survey participants who had not engaged in entrepreneurial, risk-taking behavior were more likely to point to financial gain as a perceived benefit. One interview participant, who

was an expert in entrepreneurship but had not engaged in that work stated “clearly, that’s incentive because you can make some money” regarding a tech transfer deal through NUtech, UNL’s tech transfer office. These findings appear to be the opposite of those reported by Chrisman et al. (1995), who found that monetary reward could influence faculty behavior. The survey data from UNL faculty mirrors the interview data dynamic. Taking the survey data of perceived benefits and filtering it by those who self-reported that they had actually engaged in this type of behavior, versus those who have not, revealed stark differences in perceived benefits. Those survey participants who “strongly agree” that they had engaged in this behavior were more likely to select intrinsic benefits. Alternatively, those who “strongly disagree” that they had engaged in entrepreneurial behavior were more likely to select financial gain both for themselves and the university. Figure 6 illustrates these data.

**Figure 6**

*Faculty Perceived Benefits Associated with Entrepreneurial, Risk-Taking Behavior Filtered by Self-Reported Engagement in Entrepreneurial, Risk-Taking Behavior*



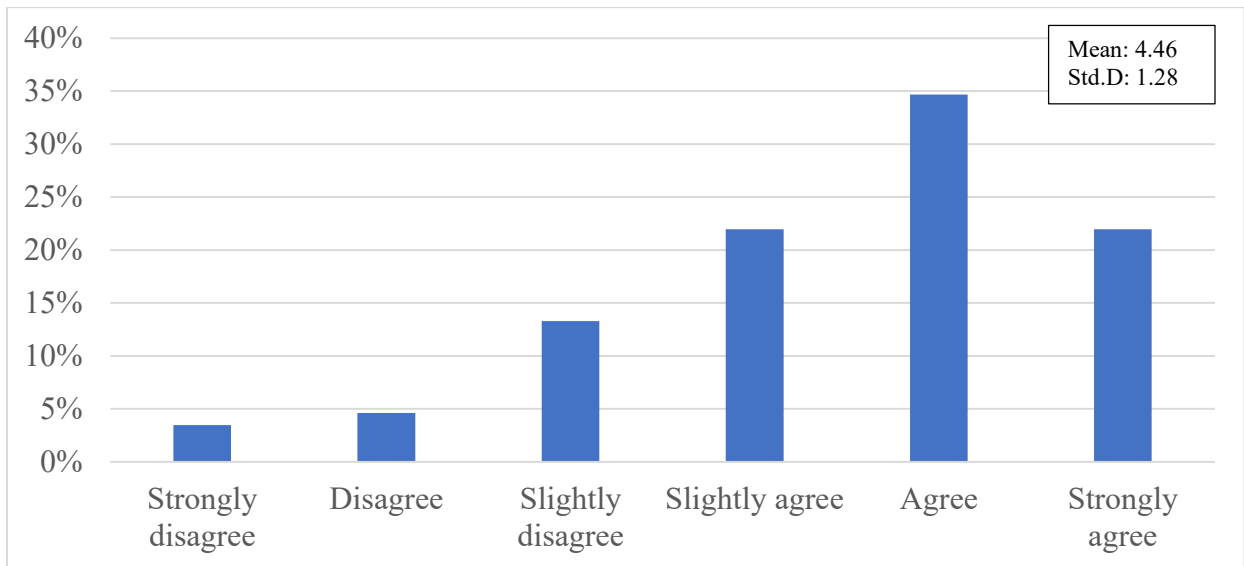
This chart illustrates that while the data indicated that faculty who engaged in entrepreneurial behavior are more likely to be intrinsically motivated, those who are not engaging in entrepreneurial behavior are more likely to perceive financial gain as the benefit to such activity. This data pointed to a significant gap in understanding of the benefits associated with and motivations for engaging in entrepreneurial behavior among those faculty who have not engaged in such activities.

***Perceived Ability to be Successful in Entrepreneurial Risk-taking Behavior***

The data indicated that the majority of faculty believe that they can be successful in this behavior, and therefore this influence was not validated. Among interview participants who had engaged in this type of behavior, two stated that self-efficacy was never an issue for them and one stated that it was not an issue if they had the time to do it well. James Lehrer simply stated, “I wasn't worried about it at all.” Five participants said that they were not sure they could be successful, but they were willing to try. These participants highlighted their persistence, willingness to take risks and fail, curiosity, and enjoyment in tackling new challenges. Of survey participants, 78.6% agreed that they believed they could be successful at engaging in entrepreneurial activity, as shown in Figure 7.

**Figure 7**

*I Believe That I Could Be Successful at Engaging in Entrepreneurial Activity*



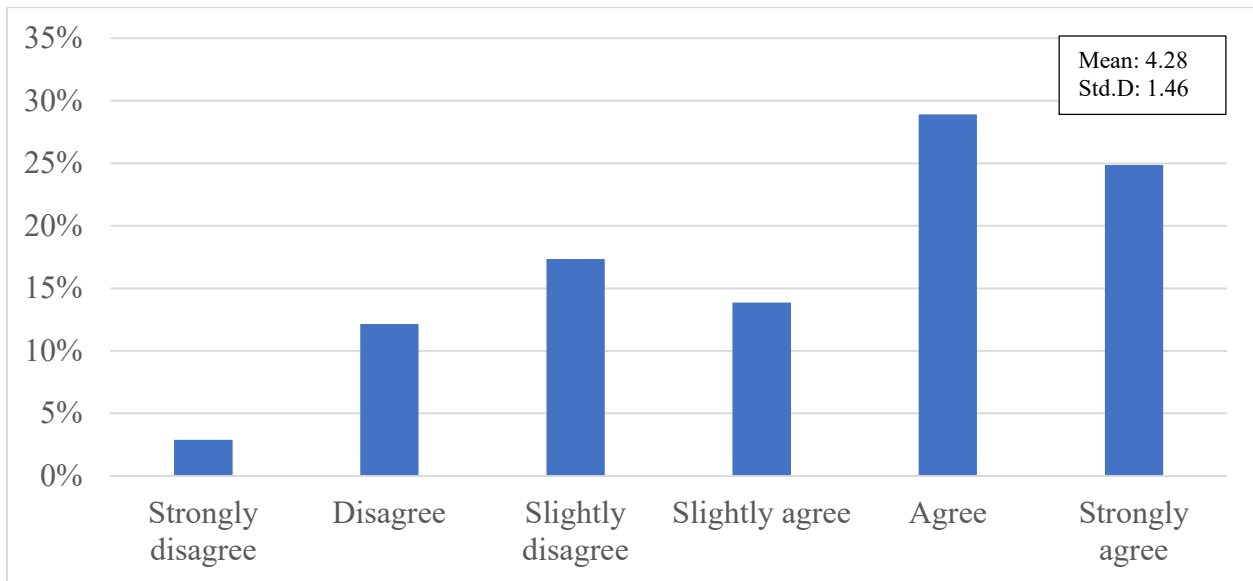
The survey data confirmed the relationship between self-efficacy and engagement in such behavior another way: only two survey participants who did not believe they could be successful said that they had engaged in such behavior. However, the relatively small portion of faculty who do not feel self-efficacious (~20%) was not a significant concern when considering the goal of a 10% increase in faculty who engage in this behavior. Bandura (1986) noted that without self-efficacy, individuals are unlikely to persist at a difficult task. Because faculty participants report feeling efficacious, this influence does not appear to be a barrier to achieving the stakeholder goal.

### ***Belief that Entrepreneurial, Risk-taking Behavior is Worth the Effort***

The interview data and survey data related to this influence partially validated this influence. Because the data did not positively say that this influence supported entrepreneurial, risk-taking behavior among faculty at UNL, innovation in the future would be useful to make this influence a stronger contributor to faculty behavior. Therefore, this influence was partially

validated. Only two interview participants, David Hunt and Josh Gibbons, spoke about the positive return on investment from this behavior. All other interview participants highlighted the costs of engaging in this behavior, including time pressures, tenure and promotion incentives, organizational rules, and the need to do funded research, without discussing that it was worth the effort. Yet even while they highlighted the costs, these were the participants who engaged in this behavior; therefore, they act as if they believe the activity was worth the effort.

Interview participants also said that they perceived that other faculty view the cost value of engaging in this behavior as high, particularly because it is hard work and not incentivized for faculty. Interview participant Taylor Harris recounted her experience with faculty generally, “they don't need to do it... I mean, they would much rather just work their 12 hours a week and go and watch Netflix than to do anything more engaging. I'm being really honest.” As noted in Chapter Two, individuals need to perceive that the utility and importance value of an activity must be higher than the cost value in order to pursue it (Rueda, 2011). However, as Figure 8 illustrates, only 32.4% of survey participants responded that it was not worth their time, leaving 67.6% who indicated to some extent that it was worth their time.

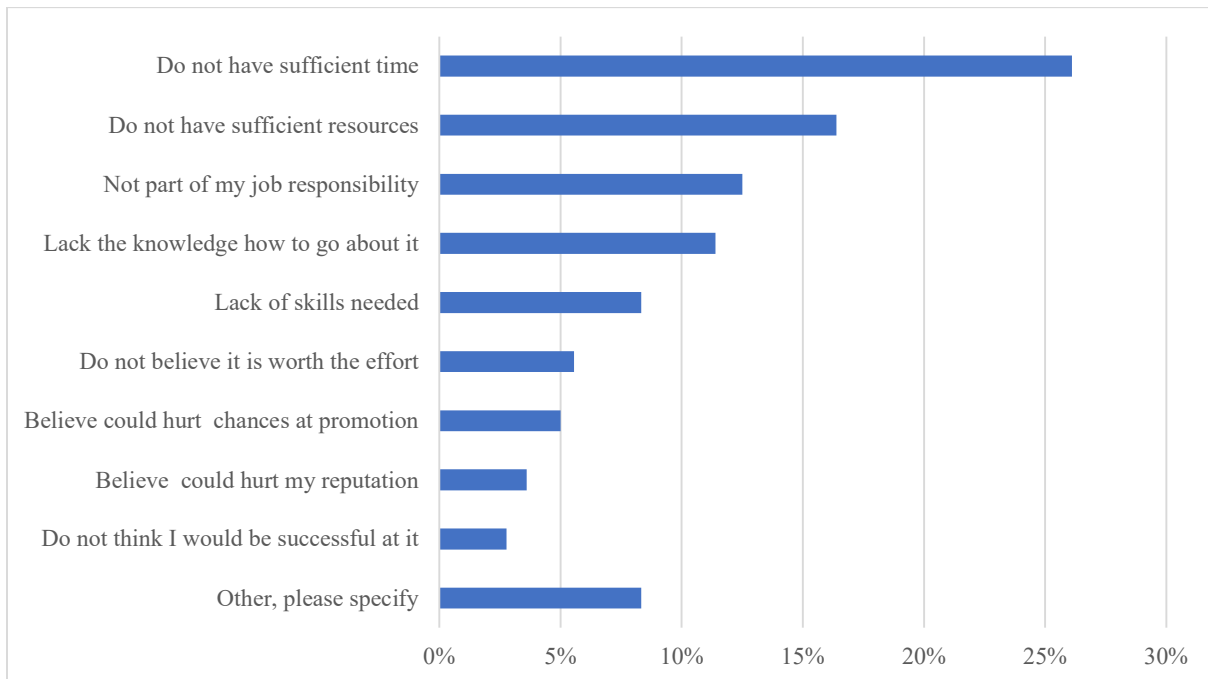
**Figure 8***Engaging in Entrepreneurial Activity Is Worth My Time*

This influence examined the internal cost-benefit analysis for faculty time and effort to engage in entrepreneurial activities. Survey data showed that approximately two-thirds of faculty believed it was worth their time to some degree (Figure 8). At the same time, survey data previously shown in Figure 6 also indicated that the benefit side of the cost-benefit equation could be improved by addressing the gap in understanding the intrinsic benefits of entrepreneurial behavior among those faculty who have not done so previously. However, Figure 9 indicates the drivers behind the cost side of this cost-benefit analysis. When survey participants identified the key barriers to their engagement in entrepreneurial activity, the largest response category was insufficient time, which received 26.1% of all responses. The following figure shows the perceived barriers. This item had 268 responses because the item asked participants to “select all that apply.”



**Figure 9**

*Faculty Perceived Barriers Associated With Entrepreneurial, Risk-Taking Behavior*



The interview and survey data indicated that faculty believed engaging in entrepreneurial, risk-taking behavior was worth the time, yet they do not feel they have enough time to do so.

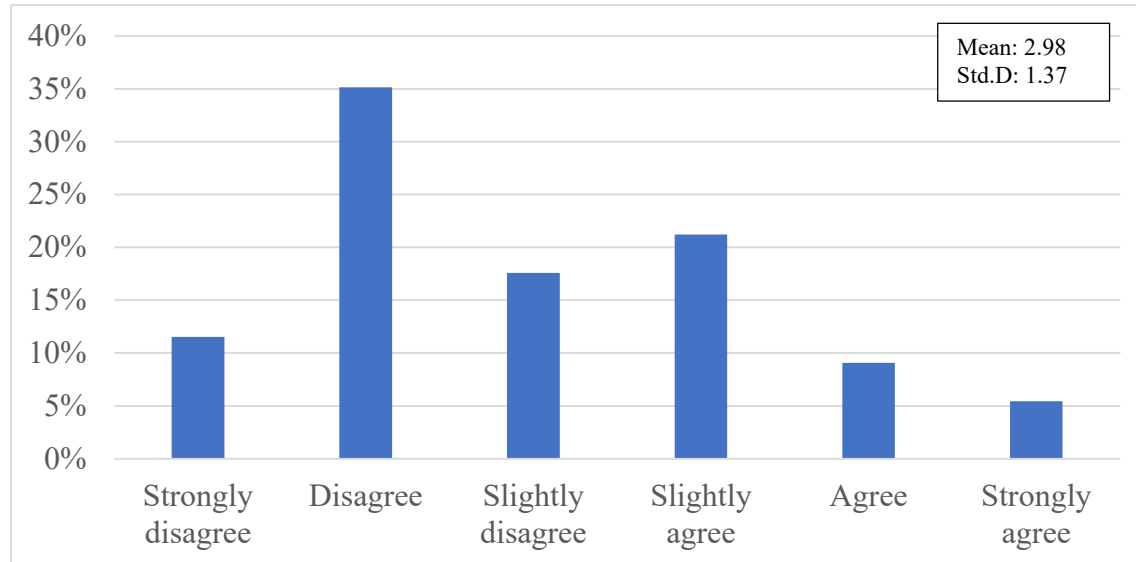
Additionally, they named a number of other barriers to engaging in this behavior that required more effort to engage in such behavior such as insufficient resources, not considered a part of their job responsibility (related to tenure and promotion guidelines) and lack of knowledge, all of which are corroborated by findings associated with other influences. Because they already have the belief that engaging in such behavior was valuable enough to warrant their time, it appears that reducing the barriers, or decreasing the cost value such that the benefits outweigh the costs, would be critical to changing behavior. This assessment was corroborated by interview findings, as Elizabeth O'Leary stated, "It's more reducing the barriers."

***Beliefs Regarding the Impact of Entrepreneurial, Risk-taking Behavior on Professional Standing***

Faculty reported that they were not concerned about unsuccessful attempts at entrepreneurial, risk-taking behavior impacting their reputation at UNL, so this influence was not validated. Three interview participants commented on ways in which they perceived engaging in this behavior could hurt their reputation, specifically as it related to fewer publications and riskier advancement along tenure track. However, this influence was specifically related to one's reputation, not professional standing and advancement with tenure and promotion, which is an organizational influence. Interview participants provided mixed perspectives in regard to university messaging that supports entrepreneurial, risk-taking activity. Two participants stated that the university communicates nothing at all that encourages entrepreneurial behavior nor discourages it, three stated the university was supportive of this behavior, and three had a negative view. Additional findings associated with university messaging are in the organization section. In the survey, Figure 10 below shows that 64.3% of participants disagreed that unsuccessful attempts at entrepreneurial, risk-taking behavior will have a negative impact on their reputation at the university; Figure 10 above shows that only 3.61% of survey respondents saw reputation concerns as a key barrier.

**Figure 10**

*If I Attempt Entrepreneurship and It Is Not Successful, It Will Hurt My Reputation Within the University*



Risk to one's reputation was not a perceived barrier to engaging in entrepreneurial, risk-taking behavior for a majority of respondents, so this influence was not validated.

### ***Summary of Motivation Findings***

The majority of faculty participants reported that there are various benefits associated with entrepreneurial, risk-taking activity, and believe it was worth their time. Faculty see the value of this behavior. However, faculty identified a number of barriers that make the cost side of the cost value equation higher, including time demands associated with their positions, especially when time demands do not prioritize this type of behavior. Lack of resources required to pursue such behavior was also a key barrier that faculty identified.

**Table 8***Assumed Motivation Influences and Validation Status*

Assumed Motivation Influence “Faculty need to...”	Validated	Partially validated	Not validated
Perceive engaging in entrepreneurial risk-taking behavior as beneficial, such as potentially significant personal economic benefits and contributing the regional economic development.	X		
Believe they are capable of being successful at effectively engaging in application of research to practice through entrepreneurial risk-taking behavior.			X
Believe that engaging in entrepreneurial risk-taking behavior is worth the effort that it will take (i.e., perceived positive cost-benefit analysis).		X	
Believe that their professional standing at the university, including progress toward tenure, will not be harmed by unsuccessful attempts at entrepreneurial risk-taking behavior.			X

Therefore, reducing the barriers, specifically related to time constraints and resource requirements, would positively influence future behavior. Both of these barriers are discussed further in the next section.

**Organizational Findings**

While knowledge and motivation affect an individual’s behavior, organizational influences impact the knowledge and motivation of the entire group of individuals. While the stakeholder goal calls for increased risk-taking behavior among faculty, it is through innovation at the organizational level that UNL can encourage faculty behavior and ultimately achieve the stakeholder goal of a 10% increase. The data reflected writing by Gallimore and Goldenberg (2001) cited in Chapter Two, indicating that changing organizational settings, including altering faculty incentives and improving resources available to support entrepreneurial, risk-taking

activities, could impact the organizational models, including a culture of willingness to adopt new behavior and trust between administration and faculty, such that faculty feel comfortable engaging in such behavior. These findings reflect those reported in Chapter Two that altering the environment can change individual behavior (Daly, 2010). Overall, the data revealed that innovation in the organizational influences would be critical to shifting faculty behavior to achieve the stakeholder goal.

### ***A Culture of Willingness Among Faculty to Adopt New Behavior***

The data indicated that faculty did not believe there was a widespread culture of faculty willingness to take risks through adopting new behavior, so this influence was validated. As noted earlier in this chapter, the study collaborator identified and selected interview participants because they were positive outliers and examples of faculty who exhibited entrepreneurial, risk-taking behavior. Yet their perspectives on this influence was primarily negative. Four interview participants discussed the existence of a small subset of faculty who were interested in this type of activity and work, in contrast to the vast majority of faculty who were not interested. Interview participants said that this cadre of faculty who engaged in this behavior did so despite the university culture. As Susan Baker said about the university setting, “I think entrepreneurship especially is characterized by a philosophy of seek forgiveness later, don't ask for permission.” This sentiment was mirrored by other interview participants. Findings from Chrisman et al. (1995) support this idea, that university culture is critical to support entrepreneurial behavior.

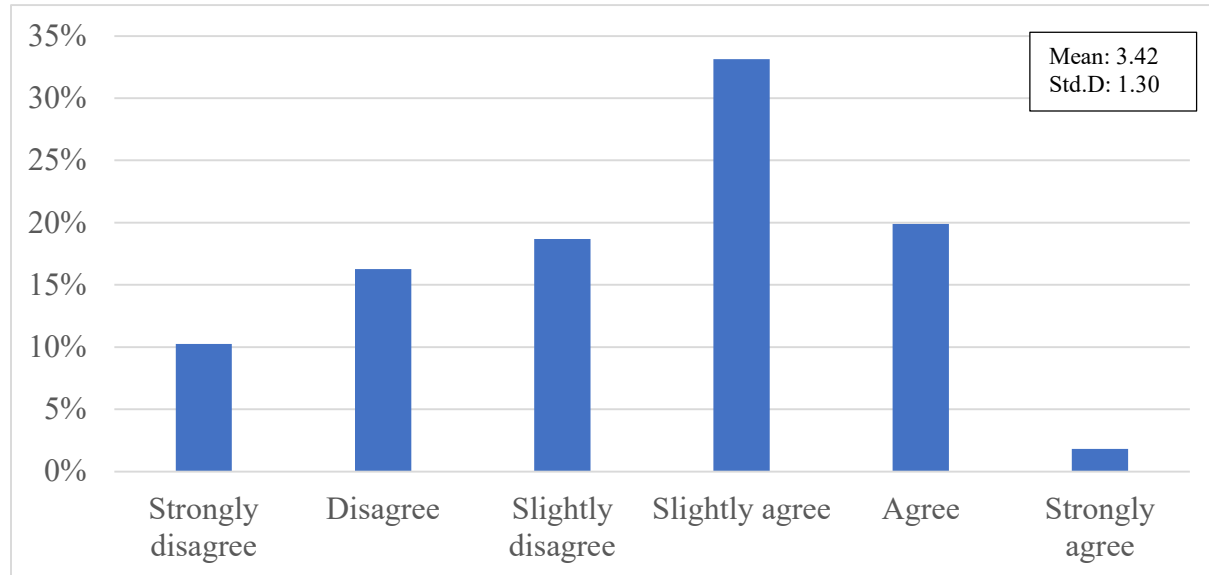
Interview participants said that often the personality of someone who chooses academia for a profession is not one that seeks risk. Therefore, rather than trying to create a culture of risk-taking across faculty, four interview participants suggested that UNL identify, encourage, and support those faculty who are inclined to engage in this type of behavior. These participants

thought that additional faculty would inherently be interested in engaging in this behavior if the culture supported it. Two interview participants speculated on the potential size of this cadre, ranging from 10% to 20% of all faculty. Interview participant John Santos reflected, “I think there's more than I thought... still going to be less than 10%... But think about how many people that is. If you've got 1,100 faculty, I mean, if we can just get 110, that would be huge.” In general, interview participants talked about their entrepreneurial, risk-taking behavior in contrast to the general faculty culture. Yet, four interview participants believed there was a cohort of faculty who are inherently driven to engage in this type of behavior and would do so if they felt it were encouraged by the university.

The survey revealed what initially looked like inconclusive data. Fifty-five percent of faculty participants agreed to some extent that UNL supports a culture of willingness to take risks and adopt new behavior specifically related to entrepreneurship. The mean (3.42, standard deviation of 1.3) was almost exactly in the middle. Yet, the strength of the responses skewed negative, such that 10.2% strong disagreed and only 1.8% strongly agreed, as depicted in Figure 11.

**Figure 11**

*UNL Supports a Culture of Willingness to Take Risks and Adopt New Behavior, Specifically Related to Entrepreneurship*



The combination of the interview data and weight of the survey data combined to show a relatively negative view of this influence, indicating that the university would need to address its culture of willingness to take risks to increase faculty behavior in the future.

#### ***A Culture of Trust, Without Fear of Diminished Professional Standing***

The data related to this influence was neither strongly positive nor negative, so the influence was partially validated, since innovation related to this influence could move it more toward being a contributor to entrepreneurial, risk-taking behavior. Sixty-one percent of survey participants did not agree that unsuccessful attempts at entrepreneurial behavior would hurt their professional standing, including progress toward tenure, indicating a level of trust among a majority of faculty. Yet, the comments from most interview participants did not align with the survey data. Three interview participants reported that they had engaged in this behavior because they were already tenured, but non-tenured faculty would be less likely to take such risk.

Interview participant James Lehrer said, “You would probably never get untenured Assistant

Professors to do it. And an Associate Professor would face real hard decisions, because it may mean not getting promoted.” Because the survey data and interview data were not aligned, this influence was not fully validated. However, the interview data indicated that some junior faculty may fear that engaging in risk-taking behavior would hurt their chances at promotion. The university may need to address this perception, so the influence is partially validated.

Related to trust is communication, because faculty are more likely to trust that entrepreneurial endeavors will not hurt their professional standing if the message comes clearly from university leadership. Interview participants had mixed responses regarding university communications regarding this behavior. Two participants stated the university’s messaging related to engaging in entrepreneurial, risk-taking behavior was positive, two said it was negative, and one reported that university leadership gives this behavior positive lip service but does not really encourage it. Two interview participants said that nothing had been communicated regarding this behavior, including James Lehrer, who said “It hasn't been clearly stated from the top university policy description so that faculty are comfortable.” However, one interview participant said that the university communications department often utilized him in promotional materials due to his entrepreneurial, risk-taking activities:

Oh, they love it. The number of times that I have been used for commercials, social media content, admissions recruiting videos ... literally, my office is part of the admissions pitch that is given to every incoming student in here. They talk about what great things are going on in the university, they talk about me and my office...

Besides this one participant, no other interview or survey participants reported positive messaging from the university. Overall, in the absence of a clear message from administration, interview participants generally felt it was safer not to engage in such behavior.



To create a culture of trust that encourages faculty to engage in entrepreneurial, risk-taking activity, a theme from the data was that there must be support from university leadership. Three interview participants reported different ways that leadership at various levels – chancellor, dean, and department chair – have an impact on their specific domain. Charles Pickering reflected on faculty who engaged in this type of behavior in his own department, “Leadership must create an environment that allows it to happen. And I don't know what I've done to make it happen in this unit, but I do know that what we see in this unit comes organically now.” Four interview participants said that leadership at various levels had discouraged this behavior. Molly Jones reflected on the chair of her department, stating, “I just didn't trust that that would be looked upon as like a positive thing at all.” Generally, at the highest, university-wide level, interview participants communicated that it was not encouraged by leadership, but this was a necessary condition for increased incidence of risk-taking activity. Samuel Lyon stated it particularly strongly: “It's got to be encouraged. [The chancellor] doesn't encourage it, but he might think he encourages it. But if the Deans don't encourage it, it's not going to happen.” Among the data from interview participants, leadership support emerged as a strong theme regarding what needs to change to increase faculty engagement in entrepreneurial, risk-taking behavior.

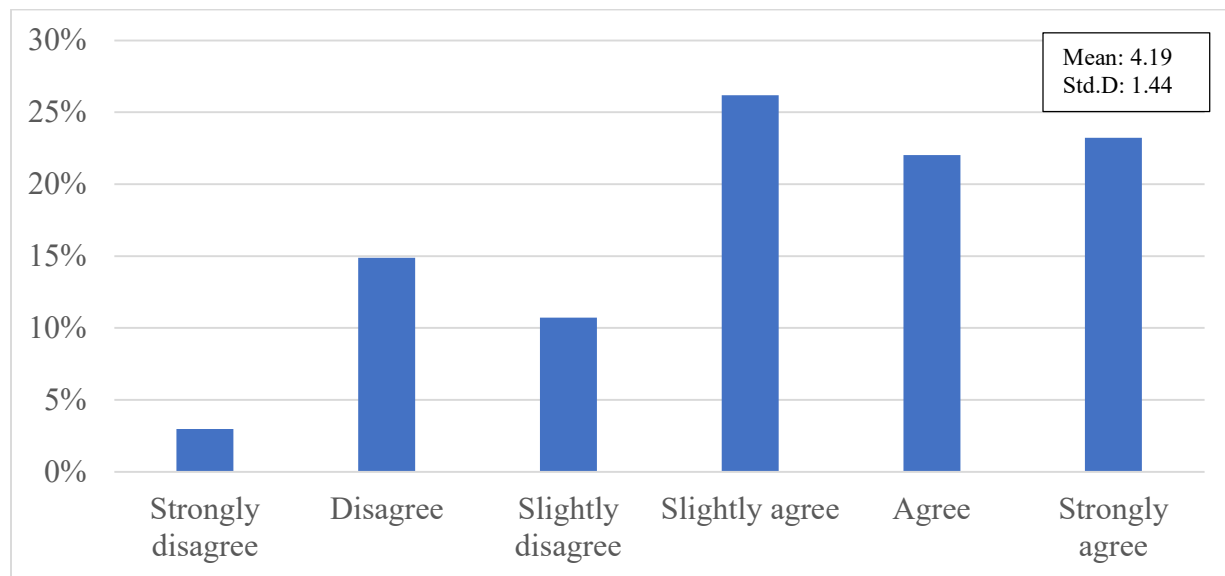
### ***Faculty Incentives Need to Reward Risk-taking Behavior***

The interview and survey data clearly indicated that current faculty incentive structures at UNL do not support entrepreneurial, risk-taking activities, and that this would need to change to get more faculty to engage in such behavior. Therefore, this influence was validated. These findings were aligned with findings related to both general behavioral theory (Daly, 2010) and more specifically to university incentives (Sanberg et al., 2014; Urbano & Guerrero, 2013).

Among the five *a priori* organizational influences, this one had the strongest reaction from both interview and survey respondents. Seventy-one percent of survey participants agreed that they would engage in entrepreneurial activity more often if it would be rewarded through faculty incentive structures, as shown in Figure 12.

**Figure 12**

*I Would Engage in Entrepreneurial Activity More Often if I Would be Rewarded Through Faculty Incentive Structures*



Additionally, interview participants, as well as survey participants in open-ended responses, offered ideas for different types of incentives to reward entrepreneurial, risk-taking behavior. These incentives fell into four categories: tenure and promotion, time, money, and recognition.

While interview and survey participants noted various forms of incentives, the driving incentive structure for faculty members was tenure and promotion. As indicated in the previous influence, four interview participants reported that engaging in entrepreneurial behavior was risky for non-tenured faculty members who sought tenure. William Brown said, “Tenure doesn't reward risk taking.” Other interview participants mirrored this thought and added more nuance. David Hunt said, “I think the problem is we have very simplistic or... inflexible way of

evaluating the young faculty for tenure promotion.” Additionally, tenure and promotion received the highest number of comments from survey respondents in opened-ended questions about what UNL could do to incentivize entrepreneurial, risk-taking behavior. The primary suggestion from interview and survey respondents to encourage this behavior was to make it a part of the tenure and promotion evaluations.

At the same time, the data uncovered institutional barriers to changing the tenure and promotion guidelines, underscoring their entrenched nature. One challenge in the data was a lack of understanding of how to value such behavior. Interview participant William Brown noted,

There is nobody on the tenure committee who knows how to evaluate this work for tenure, and/or if you do it and publish in a journal that is a multi-disciplinary journal, number one, they've never heard of it, and number two, they don't know how to accord it any value.

Even after achieving tenure, one interview participant stated that there is no post-tenure incentive to engage in such behavior. Taylor Harris said, “[tenured faculty] don't have to do anything because they have a job for life and... there is no real post-tenure review.” The university would need to think carefully about the complex factors associated with adjusting the tenure and promotion process to include entrepreneurial, risk-taking behavior, even though, it appears that this is the single most important factor that the university can impact to shift the behavior of faculty toward achieving the stakeholder goal.

The second-most reported incentive, from both interview and survey data, that participants reported would be important to encourage more faculty to engage in entrepreneurial, risk-taking activities was time. Time was related to tenure and promotion guidelines in the data in that faculty will allocate their time based on the incentive structure, and the long-standing

structure encourages traditional research and publication. Time allocation was also a factor because the university has guidelines for what proportion of time must go to teaching, research, and other activities. If time for entrepreneurial, risk-taking activities is not accounted for in those apportionments, it is unlikely faculty will engage in such behavior. One interview participant, Josh Gibbons, suggested a method to encourage this behavior: "...carving out time for people, protecting that time for people, rewarding people for that time is critical." While it was clear tenure and promotion is the key incentive that needed to change, time is another type of incentive that the university would need to align with tenure and promotion to further encourage this behavior in faculty.

Related to both tenure and promotion and time allocation, three interview participants said that the Professor of Practice structure could be a way to incentivize risk-taking behavior. Because they are not on the tenure track and do not have the same publication expectations as tenure-track faculty, there is more flexibility for UNL to structure the role in a way that incentivizes entrepreneurial, risk-taking behavior. This structure could entice new faculty in the role to be more engaged in this type of behavior. Other interview participants also reported that those individuals who choose the traditional academic path are generally not interested in entrepreneurial, risk-taking behavior, which was why they chose the tenure track initially. As Wendell Qin stated, "there are not really incentives when you think about promotion and tenure... Though if you're worried about promotion and tenure, its counter to this [entrepreneurial] thinking and you probably won't do it anyway." Two of the interview participants who were Professors of Practice noted how that role helped them engage in the behavior defined by this study. One interview participant made a comment that illustrated the alternate mindset of a Professor of Practice, "I'm a Professor of Practice, so I don't have to care

about the publish or perish idea.” However, interview participants also noted that the Professor of Practice route would need restructuring to play this role well. As another interview participant explained,

I think [a Professor of Practice appointment] is a significant thing that takes away the tenured professor pressure and allows people to do exactly the sorts of things we're talking about. But the Professor of Practice route then, in my opinion, needs more protection and security than it currently has. Like seven-year contracts, renewable, as opposed to one or three-year contracts where you just don't know what your future's going to be beyond that. But I think that the Professor of Practice route totally encourages this sort of entrepreneurial behavior and different behavior because they don't have to be worrying about the publishing.

Interview participants also reported that the expectations for Professors of Practice are unclear. A Professor of Practice interview participant recounted, “for about the first five years that I was here, I didn't even know what I was really being evaluated on, other than I was expected to be a good teacher because I was a Professor of Practice.” Another interview participant also said that Professor of Practice evaluation criteria needed to be clear from hiring date. There could be additional ways to structure non-tenure-track roles, as one survey participant suggested an “entrepreneur in residence” role that he had seen at other universities. While the university leadership can innovate on the structure of non-tenure-track roles, department chairs also need to think about Professor of Practice personnel as a part of the unit’s needs, incorporating this type of role into the overall mix in addition to tenure-line faculty. Interview participants said the Professor of Practice role would be a positive way to encourage and increase additional faculty to engage in entrepreneurial, risk-taking behavior, but it would need to be considered among the

mix with tenured faculty in every department, and the role itself would need to be structured to optimally encourage the desired behavior.

In addition to tenure and time, interview and survey participants reported on various types of financial incentives that would help encourage entrepreneurial, risk-taking behavior. One category was university funding support for the entrepreneurial work or the venture. A subset of both interview and survey participants noted that funding from the university could help get new activities started. Twenty-two open-ended responses from survey participants mirrored this theme: “Have a seed grant program that would provide funds to develop ideas.” This type of financial support can also be considered a resource, rather than a financial incentive, as discussed in a later section of this chapter.

A second type of financial incentive reported by participants was structuring deals through NUtech to be more lucrative for the faculty member. Samuel Lyon stated, “our office of tech transfer is punitive in the deals that they insist on.” This comment was corroborated by survey participants, including this open-ended response: “...reorganize royalties structure so inventors capture a larger percentage than they do currently.”

Finally, a third category was financial compensation through salaries or bonuses that reward this type of behavior. This last type of financial incentive was only said rarely among survey participants, and not at all by interview participants. While interview and survey participants reported that these various financial incentives could help encourage entrepreneurial, risk-taking behavior, this line of thought was curious when compared to the motivation finding that indicates that financial incentives do not motivate the faculty members who actually do engage in this behavior. Because of this related finding, increased salaries and bonuses may not be the most effective organization approach to change faculty behavior. However, given the lack

of procedural knowledge to gain funding for a venture, university support to fund the risk-taking behavior could be viewed as a resource needed for faculty to engage in such behavior. The upcoming section on resources explores this idea further.

Finally, study participants said that recognition for entrepreneurial, risk-taking behavior could be a motivating incentive for more faculty to engage in such activities. This finding emerged primarily from survey participants' open-ended responses. One survey participant wrote, "Recognition in publicity and at faculty events would be helpful." Two interview participants named the "Prem S. Paul Innovator of the Year" award, which provides recognition for one faculty member a year. This award was also published on the UNL website. Yet, even with the existence of this award, a survey participant said that "university-level awards for such activity" would incentivize more faculty to engage in such behavior. This discrepancy indicated that the award either was not well known or only known among those who did engage in this type of behavior, since interview participants were a part of the subset that do engage in this behavior. Regardless, this award honors one person per year, and survey participants indicated that recognition more generally, at faculty meetings, in publicity, etc., would help incentivize the desired behavior. Plus, recognition for the behavior the university wants to encourage would not only be an incentive for those recognized but would have the additional benefit of calling out role models for other faculty to witness how their peers have been successful.

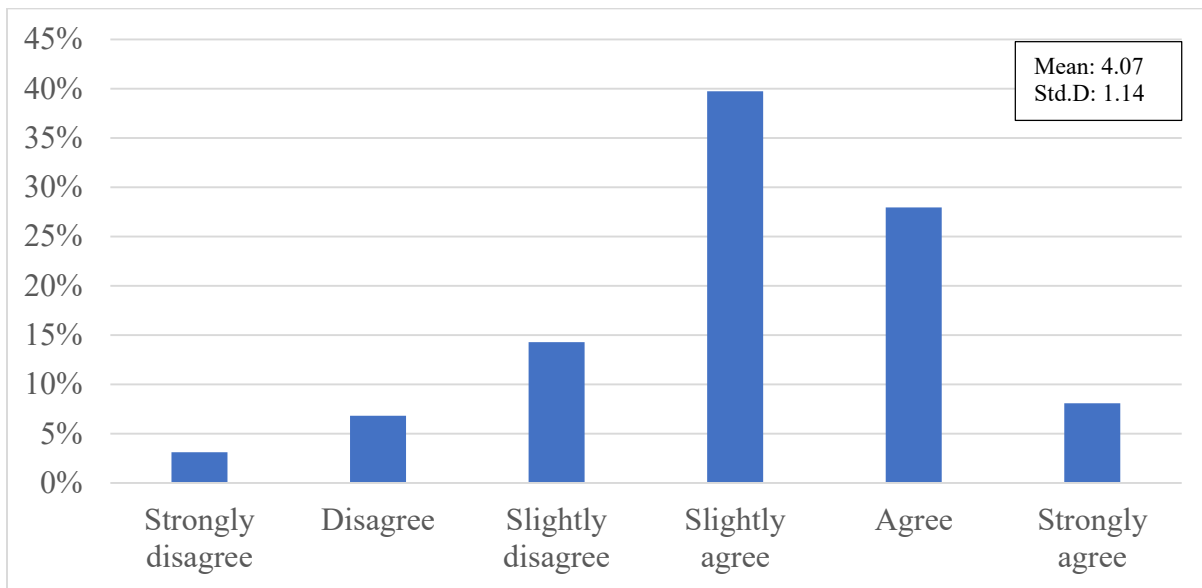
### ***Resources to Support Faculty Exist but Need to be Improved***

Data from both the interviews and survey showed that faculty participants know that resources exist, but that these resources were either not useful or not sufficient to help faculty engage in entrepreneurial, risk-taking activity. Therefore, this influence was validated as an organizational need where the university should implement changes to achieve the stakeholder

goal. The two interview participants who teach entrepreneurship were also a part of delivering one of the key resources on campus but had not engaged in entrepreneurial risk-taking activities as faculty at UNL. Of the 10 interview participants who had engaged in this behavior, two stated that they had used the university resources and six clearly stated that they had not. Among survey participants, 75.8% agreed that UNL offers dedicated services to support faculty entrepreneurial activity, and, at the same time, 68.1% agreed that they would like more support connecting their research to industry, as shown in Figures 13 and 14 respectively.

**Figure 13**

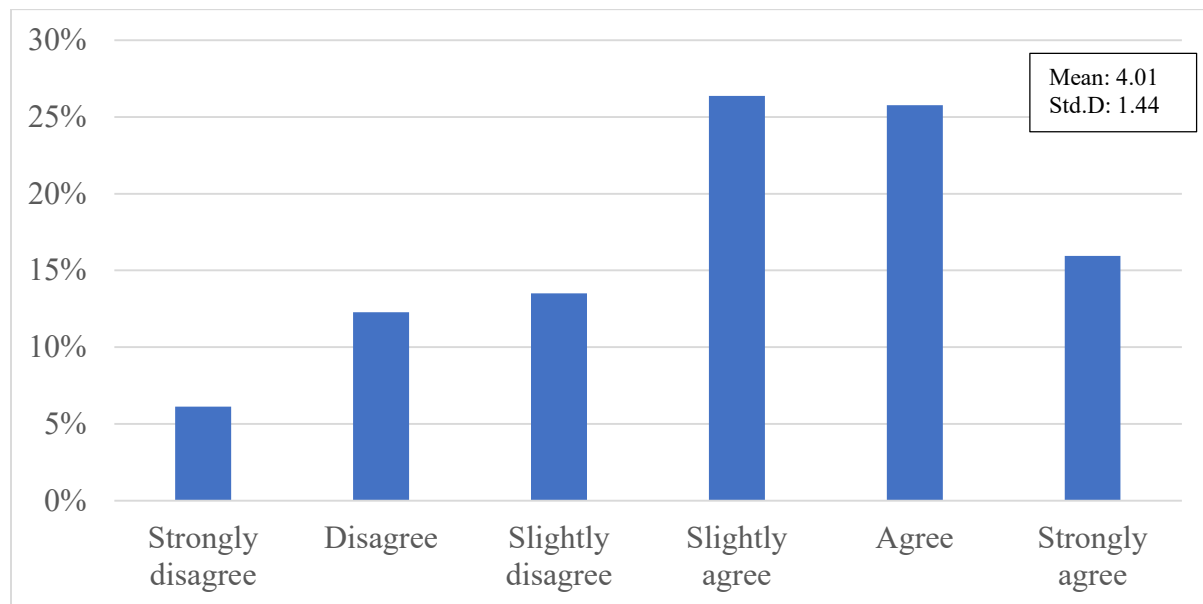
*UNL Offers Dedicated Services to Support Faculty in Entrepreneurial Activity*





**Figure 14**

*I Would Like More Support Connecting my Research To industry*



Participants reported resources that included both formal, such as the Center for Entrepreneurship or NUtech, and informal resources, such as the ability to tap interdisciplinary knowledge across the university's departments. Together, Figures 13 and 14 revealed that while faculty know that UNL provides some resources to support faculty in entrepreneurial behavior, these resources are not sufficient for what faculty feel they need to actually connect their research via entrepreneurial behavior. This finding relates directly to data referenced in the last section that which showed that insufficient resources was the second largest barrier to faculty engagement in entrepreneurial behavior (Figure 9). Additionally, faculty members' reported desire for additional support shown above relates to the gap in procedural knowledge for faculty to actually go about entrepreneurial activities. While this data does not conclude whether the current university resources are not relevant, not informative, or simply have insufficient capacity, it is clear that the majority of faculty perceive the need for further resources. Providing

enhanced resources would help reduce barriers to faculty engagement in this behavior, as discussed in the previous section.

Based on the data, one key resource on campus for engaging in entrepreneurial, risk-taking behavior was the Center for Entrepreneurship, which is housed within the business school. Two interview participants reported using the Center for Entrepreneurship. One interview participant reported positively on the help they received from the Center for Entrepreneurship. One of the positive comments included the new “Initial Customer Discovery Training” workshop that helps faculty with an entrepreneurial idea define their target audience and understand that audience’s needs, which were skills that were reported as lacking in the knowledge section of this chapter. Yet, at the same time, other interview participants stated that they did not think the Center for Entrepreneurship was helpful. Three interview participants noted that they did not think the resource was relevant for their situation. Two interview participants simply stated that the Center for Entrepreneurship staff were not talented. One interview participant who was particularly negative regarding the Center for Entrepreneurship said they had been improving in recent years, but overall, it seems that while the Center for Entrepreneurship offers some support, it was not sufficiently useful. One of the interview participants who was a part of the Center for Entrepreneurship highlighted that they would like to be doing more, but that they would need additional funding to expand their efforts. It was unclear from the data if the Center for Entrepreneurship simply needs to expand or if it needs different structure and expertise, though the data leans toward the latter based on the additional resources participants thought would be useful.

In addition to the existing units within UNL, participants outlined several other desired resources that they thought would be helpful to faculty to increase engagement in

entrepreneurial, risk-taking behavior. First, interview participants reported wanting additional support creating connections, which corresponds to the knowledge influence regarding procedure and how to go about this work. Participants wanted additional support in both building interdisciplinary relationships across the university and making connections to external businesses that could utilize their research or expertise. Related to this desire to make connections, two interview participants and survey participants reported the need for what one interview participant coined a “front door” to the university. These two interview participants said that there was no dedicated place at the university that people – both within the university who were interested in this type of activity and external people looking to make connections to expertise or research – know that they can go for those connections. Therefore, the “front door” is both internal and external facing. Internally, James Lehrer noted that, “there's got to be a plethora of ideas out there university-wide, but there's no way to communicate those things.” The interview participant who coined the term, Molly Jones, described the concept as external facing,

...when people are motivated, they don't understand how it is set up. And so one of the things that came out of our strategic planning was this idea of this front door, some place that people could call or email ... to the extent, the university does not have a good reputation with industry people, I think part of it is that they just don't know how to get in... We say we really want to work with them, but we do not do a very good job of actually doing it and receiving them and connecting them in a way that's meaningful.

Molly Jones went on to explain that, in the absence of this resource, external people may make a cold phone call to a faculty member they think is relevant and not hear back because that faculty member was not interested. The result is that the potential external partner is discouraged and looks elsewhere, when there may have been someone else in the university who was interested in

connecting. At the same time, faculty members often simply do not know where to go to establish these connections.

Another desired resource that emerged from the data was mentorship and role models. This data directly reflected that of Urbano and Guerrero (2013), who found that role models are a key element in an “entrepreneurial university” because they demonstrate to other faculty that it is possible to be successful, thereby increasing others’ self-efficacy. Two interview participants at UNL who had engaged in this behavior noted that mentors had helped them. As Wendell Qin said, “I had a mentor that helped me get here.” Additionally, eight interview participants said that role models would help. David Hunt said,

I think the best thing is when they see someone who is good or who is successful...

through mentorship probably is the best way. I think probably there are no better ways to train the younger faculty to do that.

David Hunt highlighted throughout his interview that role models and mentors can impact all three of the categories of influences – knowledge, motivation, and organization – by helping the next generation of faculty learn the skills and processes needed for the knowledge influences, feel motivated through seeing success, and understanding that the organization supports this behavior.

One more resource that interview and survey participants said would be useful was financial resources. This idea was linked to financial incentives, though some interview participants discussed money as an incentive for a faculty member to engage entrepreneurial, risk-taking behavior and others talked about money as a resource that the university needs to invest if it wants to see an increase in faculty engagement. In the context of the latter, participants reported needing money to invest in the activities necessary to pursue

entrepreneurial, risk-taking endeavors, such as drug trials. In this way, participants saw investment in start-up ventures in two ways, either as an incentive or as a resource needed to pursue certain paths associated with entrepreneurial, risk-taking behavior. Additionally, financial resources would be required to improve other support mechanisms outlined in this section. In this way, money works as both a personal incentive and an organizational resource depending on how it was used, but some financial investment will likely be needed to improve university resources.

### ***Partially Validated Evidence Regarding Communication and Promotion of the Faculty***

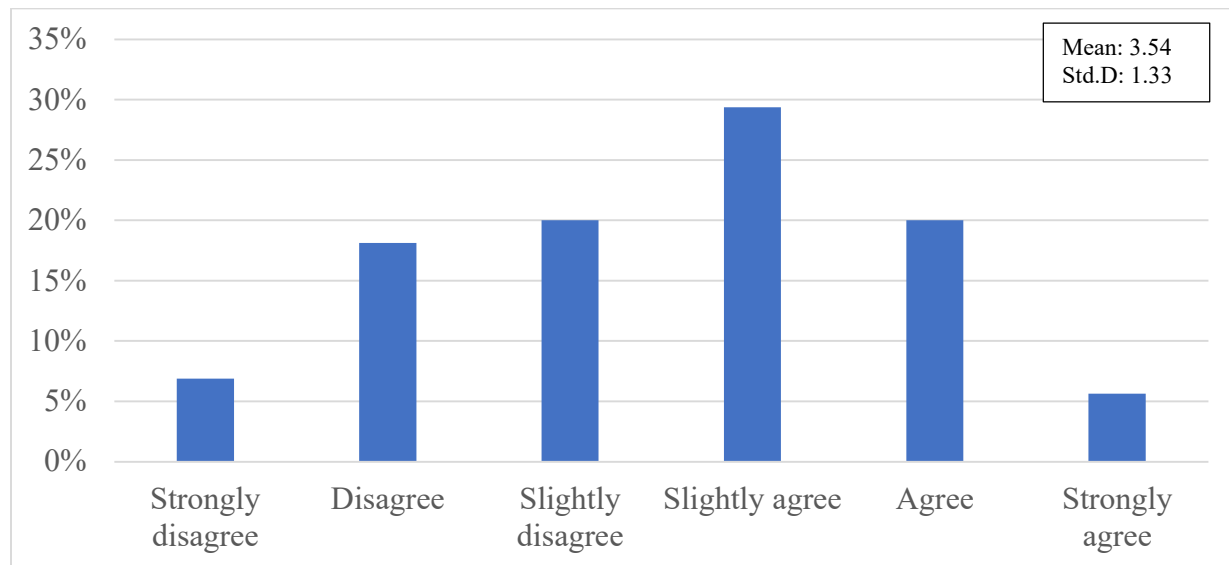
#### ***Resources***

The data partially validated the final organizational influence, since the data was not strongly positive nor negative, such that future innovation could make this influence a stronger contributor to faculty entrepreneurial, risk-taking behavior. Among the 12 interview participants, two were a part of the resources and were responsible for communication and promotion. These interview participants reported that faculty utilization of support programs was minimal, though it was unclear if this was because faculty did not know about the programs or the programs were not considered helpful. These findings mirrored those of Chrisman et al. (1995) who reported limited faculty usage of resources but noted that these resources were significant to fostering entrepreneurial behavior regardless of usage. Two interview participants clearly knew about the resources, even though they had not used them. The one person who had used the Center for Entrepreneurship said they learned out about it from a source external to UNL. Interview participants reported that the resources were hard to find, and at least four interview participants thought that UNL needed to do a better job of promoting the resources available. The survey data were also inconclusive, with 55.01% of survey participants agreeing to some extent that UNL

has promoted the resources available to support faculty entrepreneurial activity, as shown in Figure 15.

**Figure 15**

*UNL Has Promoted the Resources Available to Support Faculty Entrepreneurial Activity*



This evidence that a majority of faculty respondents reported that UNL has promoted resources aligns with the data in that showed the majority of respondents perceived that UNL provides resources (Figure 13). Together, these findings, along with the data that showed that the majority of faculty would like more support (Figure 14), further corroborates the finding that if UNL wants to improve faculty utilization of its resources, it may need to first improve the resources themselves.

### ***Summary of Organization Findings***

While there were influences in the knowledge and motivation sections that need to be addressed to increase faculty engagement in entrepreneurial, risk-taking behavior in the future, the data indicated that the organization influences were the most critical to change behavior and achieve the stakeholder goal. As previously discussed, organizational settings and models

influence knowledge and motivation influences. Table 9 displays a summary of organizational influences and their validation status.

**Table 9**

*Assumed Organizational Influences and Validation Status*

Assumed Organizational Influence “The university needs...”	Validated	Partially validated	Not validated
A culture of willingness among faculty to take risks through adopting new behavior.	X		
A culture of trust between the administration and faculty, such that faculty feel comfortable engaging in this type of behavior without fear of diminished professional standing.		X	
Faculty incentive structures that reward engagement in entrepreneurial risk-taking behavior through guidelines and criteria for tenure and promotion.	X		
Resources to support faculty engagement in entrepreneurial risk-taking behavior, such as connections to potential collaborations, mentorship and role models, and funding, among others.	X		
Communication and promotion of the services and resources it provides faculty to support entrepreneurial risk-taking behavior.		X	

Altering organizational settings, specifically the tenure and promotions guidelines and the time requirements associated with different faculty roles, would change faculty incentives and also impact how faculty perceive the culture at the university. Additionally, enhanced resources could help faculty address the knowledge gaps that stand in the way of their ability to pursue entrepreneurial, risk-taking behavior.

**Emergent Themes Beyond the Anticipated Influences**

While the interview and survey questions linked directly to the knowledge, motivation, and organization influences detailed in Chapter Two, two additional themes emerged from the

data that span across the influences. First, because the data indicated that engaging in entrepreneurial, risk-taking behavior was often an individual, inherent quality, hiring for people who have this internal drive would be a way to increase the desired behavior. Second, while this study did not directly investigate NUtech, the tech transfer office emerged as a key influence that was a barrier but could be an enabler if structured differently. This section reports the findings related to these two emergent themes.

### **The University Needs to Hire People Inclined to Engage in these Activities**

A strong emergent theme revealed that there was a cadre of faculty who have a predisposition to engage in the entrepreneurial, risk-taking behavior defined by this study. These faculty will do so regardless of the organizational influences. The data indicated that faculty who engaged in entrepreneurial, risk-taking behavior often have internal traits that make them inherently inclined to engage in such behavior, which aligned with previous literature cited in Chapter 2 (Khorrami et al., 2018; Van Dam, Schipper, & Runhaar, 2010). Therefore, the university would need to hire for people with those traits if they want to expand the cadre who engage in entrepreneurial endeavors. This conclusion was also corroborated in the literature review, which reported that leaders can bolster the desired behavior by hiring for it (Gino, 2018). When asked about skills required to engage in such activities, interview participants overwhelmingly described personality traits that they did not believe could always be learned. Susan Baker summed it up when she said, “Much of that is innate and comes from the sort of person that you are. But I know from my own experience that you can cultivate some of these [traits].” Interview participants reported persistence most often as the characteristic needed to successfully engage in risk-taking endeavors. Persistence included concepts like the ability to



take criticism and a positive inclination toward risk, failure, and experimentation. As Charles Pickering stated,

It's internal. It's a drive. If you don't have the sense of urgency to discover, and to work hard, and to fail, and to succeed, and to fail, and fail, and fail, and succeed, it won't work. It will never work. We get knocked down a lot, whether it be a funding agency, whether it be a paper not accepted for publication, whether it be multiple failures in the lab, you have to take it in stride. It's part of the process.

Additional traits that interview participants discussed as inherent included curiosity, people skills, interest in engaging in this behavior, interdisciplinary thinking, and scrappiness. Interview participants talked about faculty needing the ability to think outside of the traditional rules of academia and requiring a certain comfort with uncertainty. These interview participants noted that these traits were not common among tenure-track faculty currently. Molly Jones stated, “You have to be willing to just ignore some of the bureaucracy and the rules and maybe not necessarily bend the rules but be comfortable with some ambiguity around the rules.” This attitude was similar to a theme noted earlier in this chapter regarding faculty who engaged in these activities despite the university barriers. The interview participants who did engage in the behavior identified in this study tended to refer to themselves as non-traditional academics. Across the board, interview participants highlighted ways in which they felt a certain type of person would engage in this type of behavior more naturally than others.

Because interview participants saw engagement in entrepreneurial, risk-taking behavior as a natural inclination, many participants noted that the university would need to look for these people internally and hire for them if they really wanted to change the ethos around risk-taking. As noted earlier in this chapter, four interview participants reported that there was a small cadre

of faculty who already have a tendency toward this type of behavior, and that increased identification and encouragement of these existing faculty members would be a strong place to start. Additionally, the majority of interview participants said that the university would need to hire for people who want to engage in this type of activity to increase its incidence. Yet, interview participants also said that hiring for faculty with this inclination would take overcoming barriers. One barrier was the break from traditional hiring. As Taylor Harris stated, “I saw in my first hiring process that people just wanted to hire people like them because then they were not threatened by them.” Another barrier was the university’s desire to keep up with other research institutions. John Santos said, “We've just mirrored the big 10, and I think that's where all the focus has been. And what you're potentially doing is discouraging the creativity. You're expecting everyone to fit the mold of...what a big 10 university looks like.” The ability to hire for faculty members who would be more likely to engage in entrepreneurial, risk-taking behavior would also be tied to tenure and promotion evaluations, such that faculty who desire to engage in this behavior would be less interested to join an institution that discourages it in annual evaluations. Therefore, the university culture would need to change via innovation associated with each of the validated influences in this study, including incentivizing the desired behavior, before hiring changes could occur. While it was a clear theme among interview participants that one way to increase entrepreneurial, risk-taking behavior among faculty is to hire for it, it was also evident that hiring practices need to be a later phase in a series of changes that to support this behavior.

### **NUtech is Currently a Barrier but Could be a Resource**

NUtech Ventures (NUtech), UNL’s tech transfer office, was the university department that was noted most among participants. It is a nonprofit affiliate of UNL that works to license

intellectual property and commercialize technology developed on the Lincoln and Kearney campuses. NUtech's mission states, "to promote economic development and improve quality of life" and the website states that "we also promote entrepreneurship through programming and sponsored events" (NUtech Ventures, 2020).

Yet interview participants primarily discussed NUtech as a barrier to entrepreneurial activity, rather than a resource. The previous section included the finding that participants believe NUtech deals do not allow for adequate financial incentives for faculty members. Samuel Lyon suggested changing the deal structure to encourage risk-taking:

The Tech Transfer Center then owns it, so [faculty] only have one choice. That's to go negotiate to license it back from the Tech Transfer Center. And at least in the past, the deals were a percent of revenue, not a percent of profit. So, a percent of revenue is a deal killer, because that's going to kill risk-taking. Silicon Valley doesn't work on, 'I'll give you 10 million dollars for a percentage of your revenue.' So perhaps... looking at tried and true models that address risk-taking and follow those processes.

In addition to the financial element, two interview participants noted that NUtech does not do a good job of licensing the technology because they do not have the appropriate capacity or capabilities. As Charles Pickering said,

In some ways NUtech needs to be a bit more aggressive. So you get to the point of having a provisional or a patent, and then it gets stuck on a shelf... really what faculty that are going down this road need is the liaison with the community and with the investors to see how this is going to be impactful in its own right. Otherwise it gets shelved.

Another interview participant, Elizabeth O'Leary said,

My understanding is that [NUtech] is very good on agricultural things. So, if you have a new cultivar of wheat or corn or soy... then they know what to do. If you are trying to do something medically oriented, they have no idea.”

As the earlier motivation data indicated, faculty who engage in this behavior are doing so to help people, advance science, and apply their research. Therefore, having a patent that nobody can apply because the university owns it and the tech transfer office does not know how to execute on it was de-motivating for those faculty who would engage in this type of behavior. As a result of the unfavorable deal structures and the inability to use the intellectual property once its patented, interview participants reported that some faculty choose to pursue this type of endeavor outside of the university. While there are rules prohibiting this behavior outside of the university, there are gray areas that faculty will find to pursue their work elsewhere because they find NUtech so challenging. This finding indicated that more faculty may be interested in engaging in entrepreneurial behavior than currently do so at the university but choose not to due to organizational barriers. Therefore, transforming NUtech to be a resource, rather than a barrier, would help increase entrepreneurial behavior among faculty.

### **Conclusion**

Data collected from 12 interview participants and 188 survey participants validated five and partially validated three of the 12 influences detailed in Chapter 2. Additionally, two emergent themes surfaced from the participant data. Overall, while participants demonstrated that they understand the benefits of entrepreneurial behavior, they reported lacking the procedural knowledge required to engage in such activity. Additionally, the data indicated that the barriers to engaging in such endeavors need to be minimized, therefore tipping the cost-benefit analysis to be more positive. Finally, the data showed that organizational influences were

the primary area where innovation would need to occur to increase faculty engagement in entrepreneurial activities.

Chapter Two cites research in behavioral theory that found that altering the environment changes individuals' behavior (Daly, 2010), thereby drawing the connection between organization influences, which impact the faculty environment, and the potential impact on individual knowledge and motivation influences. Innovating to advance on the five organizational influences that the data validated or partially validated, and the two emergent influences would likely have an impact on the individual-focused knowledge and motivation influences as well. Chapter Five outlines four recommendations, focusing specifically on organizational changes, that together address each of the validated and partially validated influences.

## CHAPTER FIVE: RECOMMENDATIONS

This innovation study explored what UNL would need to do to increase the incidence of faculty engagement in entrepreneurial, risk-taking behavior. The literature review indicated that applying knowledge and research to practical solutions in the community could help spur regional social and economic development and increase the relevance of the university. Data collected through interviews with faculty who have engaged in this behavior and a survey sent to all faculty either validated or partially validated eight knowledge, motivation, and organizational influences laid out in Chapter Two and two emergent influences. In an innovation study, data validation means that those influences would need to be addressed and shifts would need to occur in the future to achieve an increase in faculty engagement in entrepreneurial, risk-taking behavior.

This chapter briefly reviews the validated and partially validated influences and provides recommendations to address them. The recommendations include:

1. Defining and communicating the desired entrepreneurial, risk-taking behavior.
2. Building a university-wide unit to identify and support faculty who want to engage.
3. Revamping NUtech.
4. Adapting faculty incentives and reward structures.

The chapter then lays out implementation considerations and an evaluation framework to assess progress. It concludes with an overview of limitations and ideas for future research to further address how universities can enhance innovation and entrepreneurship for long-term relevance and sustainability.

**Discussion of Key Findings**

The majority of the validated and partially validated influences related to the organization construct in the framework used in this study. Additionally, as discussed in Chapter Two, organization settings and models often influence individuals’ behavior. Therefore, the recommendations relate specifically to what the university can do as an organization to encourage a shift in faculty behavior. The following table provides an overview of the influences that were validated or partially validated. The table includes partially validated influences because there was not convincing evidence that these influences were currently working well, and some changes may help to improve on these dimensions as well. Table also links the recommendations, detailed in the next section, to the relevant influences.

**Table 10**

*Validated Influences*

<b>Gap Analysis Component</b>	<b>Validated</b>	<b>Partially validated</b>	<b>Influence</b>	<b>Associated Recommendation</b>
Knowledge	X		The steps necessary to engage in entrepreneurial risk-taking behavior, including connecting scholarship to practical implications and building relationships with external partners.	2. Build a university-wide unit to identify and support faculty who want to engage.
Motivation “Faculty need to...”	X		Perceive engaging in entrepreneurial risk-taking behavior as beneficial, such as potentially significant personal economic benefits and contributing the regional economic development.	3. Revamp NUtech. 4. Adapt faculty incentives and reward structures.
		X	Believe that engaging in entrepreneurial risk-taking behavior is worth the effort that it will take (i.e., perceived positive cost-benefit analysis).	3. Revamp NUtech. 4. Adapt faculty incentives and reward structures.

Table 10, continued

Gap Analysis Component	Validated	Partially validated	Influence	Associated Recommendation
Organization “ <i>The university needs...</i> ”	X		A culture of willingness among faculty to take risks through adopting new behavior.	1. Define the desired entrepreneurial, risk-taking behavior. 2. Build a university-wide unit to identify and support faculty who want to engage. 3. Revamp NUtech. 4. Adapt faculty incentives and reward structures.
		X	A culture of trust between the administration and faculty, such that faculty feel comfortable engaging in this type of behavior without fear of diminished professional standing.	1. Define the desired entrepreneurial, risk-taking behavior. 4. Adapt faculty incentives and reward structure.
	X		Faculty incentive structures that reward engagement in entrepreneurial risk-taking behavior through guidelines and criteria for tenure and promotion.	4. Adapt faculty incentives and reward structure.
	X		Resources to support faculty engagement in entrepreneurial risk-taking behavior, such as connections to potential collaborations, mentorship and role models, and funding, among others.	2. Build a university-wide unit to identify and support faculty who want to engage. 3. Revamp NUtech.
		X	Communication and promotion of the services and resources it provides faculty to support entrepreneurial risk-taking behavior.	2. Build a university-wide unit to identify and support faculty who want to engage.
Emergent influences	X		The university needs to hire people inclined to engage in this behavior.	1. Define the desired entrepreneurial, risk-taking behavior. 2. Build a university-wide unit to identify and support faculty who want to engage. 4. Adapt faculty incentives and reward structure.
	X		NUtech needs to be considered a resource, rather than a barrier.	3. Revamp NUtech.

As the table shows, the four recommendations address all validated and partially validated influences. The following section explains each of these recommendations in detail and why it is important to take these actions.



### Recommendations

Table 10 lays out how the four recommendations that address the validated and partially validated influences identified in Chapter Four, both *a priori* and emergent influences from the data. The first recommendation, defining the desired behavior, would be sequenced first so faculty better understand that the university supports risk-taking. The second recommendation, creating a university-wide unit, would allow for the university to integrate interdisciplinary efforts across colleges and establish a conspicuous place for anyone interested in these activities – both inside and outside of the university – as a place to go for support. The third and fourth recommendations, revamping NUtech and adjusting faculty incentives and rewards, would improve the incentives for faculty to engage in the desired behavior. Generally, the sequencing would need to occur in this order, such that faculty know what is desired and the enhanced resources are in place when the adjusted incentives begin to impact faculty behavior. The following sub-sections further describe each of these recommendations.

#### **Recommendation 1: Define and Communicate the Desired Entrepreneurial, Risk-Taking Behavior**

The first step toward creating “a campus-wide ethos of informed risk-taking” is to define what the organization means by “informed risk taking.” This recommendation relates to the data in Chapter 4 that faculty interview participants did not feel there was clear support from leadership to engage in entrepreneurial behavior, and that it could even be risky for non-tenured faculty. This recommendation also takes into account the research by Perkins (1973) and Marshall (2011) indicating that HEIs are extraordinarily complex organizations, with an extensive web of stakeholders and objectives. This initial step would gather feedback from each of these stakeholder groups to better understand their perspectives, with the goal of greater buy-

in. Taking this step would also help build a culture of willingness among faculty to take risks by laying the groundwork so that faculty understand what behavior leadership encourages. The definition will then form the basis for all other solutions listed below.

Defining UNL's interpretation of "informed risk taking" would start with facilitating conversations across UNL stakeholders, primarily with faculty from all departments and colleges, to ensure their perspectives are aligned with the definition. These conversations could spotlight more of the entrepreneurial work being done currently to share the experience with faculty who do not currently engage in this behavior and draw out those who currently do so without the knowledge of university leadership. Discussions could lead to more insight into how faculty would like to engage in this type of work and be supported in the future. Some of this work may have occurred during the N | 150 process and now needs to be fleshed out in a more concrete manner. After creating a clear definition, leadership will need to communicate the definition throughout the university, utilizing the leadership structure of the Deans to communicate with each college, so that all faculty understand that entrepreneurship and risk-taking will be supported.

### **Recommendation 2: Build a University-Wide Unit to Identify and Support Entrepreneurial Faculty**

Next, UNL could create a unit – office, department, or center – on campus that is not associated with specific college. This unit would ultimately be accountable for achieving the performance goal defined in Chapter 1, increasing the occurrence of UNL faculty engaging in entrepreneurial, risk-taking behavior. As noted in the findings, interview participants indicated that there are a cadre of faculty members who are inherently driven toward entrepreneurial, risk-taking behavior, and who will do it regardless of the institution's support. However, interview

participants who currently engage in this behavior commented that this cadre of faculty are not currently well identified, supported, and connected to create an encouraging and motivating atmosphere. This unit would be responsible for identifying those faculty who have the propensity to engage in this type of work from across all colleges and departments and offer the support needed to encourage faculty entrepreneurial, risk-taking behavior. This unit would act as the central UNL hub for faculty to go for support, including both making connections with similarly motivated faculty across UNL and making connections to external partners who can help faculty apply their research in practical settings. Helping with these external connections link directly to findings from the faculty interviews and survey indicating that this is an area where faculty could use additional support.

While the Center of Entrepreneurship (CEL) serves some of this purpose currently, there are a number of reasons to create a new, separate unit to carry out this function. The Center for Entrepreneurship is currently located within the business college, which is a siloed academic unit. Perkins (1973) noted that as universities were originally structured to serve the original mission, to teach. The mission has now evolved to include service to society, but the structure has not yet adapted, making it more difficult to carry out that mission (Perkins, 1973). Therefore, creating a unit responsible for supporting university-wide that is outside of a traditional, academic unit, would allow for a new structure to better carry out the intended purpose. Christensen and Overdorf (2000) wrote that when an organization requires new capabilities and processes, leaders must establish new organizational structures to build up those capabilities. They assert that it is difficult for traditional organizational structures to begin thinking and acting differently to address new challenges: “Managers need to pull the relevant people out of the existing organization and draw a new boundary around a new group. Often, organizational

boundaries were first drawn to facilitate the operation of existing processes, and they impede the creation of new processes” (Christensen & Overdorf, 2000). Additionally, the Center for Entrepreneurship is led by faculty members who studied entrepreneurship but have not necessarily engaged in it, as reported in Chapter Four, and their primary goal is to teach the discipline. Interview data indicated that faculty had the impression that the Center for Entrepreneurship was not intended to support their entrepreneurial activity, and they were unclear about the mission for the Center for Entrepreneurship. A university-wide unit that is not intended for teaching could execute on a more clearly defined mission to support faculty who wish to engage in this type of behavior. This university-wide unit would then replace the Center for Entrepreneurship, or partner with a re-purposed Center for Entrepreneurship that would focus exclusively on students studying entrepreneurship. Finally, because colleges are quite siloed, some faculty participant data indicated they not all faculty felt comfortable going to the business college. A university-wide unit could operate across these siloes, thereby encouraging faculty from all colleges to engage and spurring interdisciplinary collaboration.

This focus on interdisciplinary activity links directly to the n2025 Strategic Plan, which lays out the strategy for the first five years of the 25-year vision put forth in the N | 150 Report. The n2025 Strategic Plan specifically mentions “to foster innovative, interdisciplinary endeavors and solve challenges critical to Nebraska and the world” (UNL, 2020). This recommendation aligns with the research of Urbano and Guerrero (2013) who stated that the “entrepreneurial university” has set up “transdisciplinary and heterogenous structures, as well as hybridizing organisms for collaborating, networking and partnering with multiple industries, universities and private and public institutions in both national and international contexts” (p. 46). This unit would partner with other resources across the campus, including NUtech, UNL’s tech transfer

office, to funnel people to resources as needed. The unit could also work with and support colleges or departments that seek to hire for these skills, including in Professor of Practice roles. It could also partner with the Extension Office to the extent that the goal of entrepreneurial, risk-taking behavior is intended to spur regional social and economic development. Because the Extension Office is a long-standing office with a specific mandate and engrained ways of operating within the IANR, it is likely not the best implementation location for new thinking. Nonetheless, the Extension Office has a lot of applicable and valuable experience to share and a future partnership could be to the advantage of both units. Finally, this interdisciplinary unit would act as the “front door” for the Nebraska community outside of UNL for external people who would like to connect with expertise and find partners within the university. This need for a “front door” stems directly from the comments from interview participants in Chapter 4.

To create a unit that is accountable for increasing entrepreneurial, risk-taking behavior, the first step is to create a line item for this unit in the university-wide budget. This recommendation is also supported by published research, which found that an “entrepreneurial university” has policies and a budget that enable potential entrepreneurs to develop within the university (Urbano & Guerrero, 2013). Additional details about this budget is in the next section, “Resource requirements.” Tied to budget allocations, UNL leadership would need to develop a formal mandate for the unit, including responsibilities and expected outcomes, many of which are included in this chapter. This mandate will drive the next action step: hiring a leader. The new leader will need to take the mandate and turn it into a strategic plan for the unit, which they then implement over the coming years.

**Recommendation 3: Revamp NUtech**

In order for the unit described above to successfully collaborate with NUtech, the next solution would be to revamp NUtech to be a positive resource to faculty who wish to utilize their research findings toward practical applications, to help them with the process knowledge and skills needed to execute on entrepreneurial behavior.. This study did not include an in-depth analysis of NUtech's current expertise, capacity and operations, so the information is primarily based on the experiences and perceptions of interview participants who have engaged in entrepreneurial activity. Data from interview participants indicated that NUtech's efforts focused primarily on agriculture. Given the prominence of the agriculture sector in Nebraska, this focus may be warranted. However, two interview participants stated that their patents were not utilized and were wasted "sitting on the shelf." Because faculty interview participants were primarily motivated by helping people and advancing their field, participants expressed frustration that they perceived their research was stuck within NUtech and not utilized via licensing. Two interview participants also noted that licensing deals through NUtech are not financially favorable for faculty, leading some faculty to pursue deals outside of the university structure. Revamping NUtech may require staff with expertise in additional sectors. Also, a greater orientation toward faculty perceptions, including improving the incentives and reducing the barriers could support more faculty to engage, potentially leading to a stronger program and university. It could be useful for NUtech to expand its scope and seek out staff to go beyond agriculture innovations and restructure its agreements with faculty. Even if each individual patent or licensing deal balances incentives more to the faculty member than the university, more deals going through NUtech overall means more incentives for UNL. NUtech can then work with the interdisciplinary unit described above to identify faculty with ideas that could go through

NUtech and encourage them to apply their research. A revamped NUtech could also increase its efforts to create partnerships with entrepreneurs, venture capitalists, angel investors, and others to create a network to support new solutions coming out of UNL research. This recommendation comes directly from the survey data that showed that the majority of faculty agree with the item “I would like more support connecting my research to industry” (Figure 14).

The action steps required to revamp NUtech would begin with a research phase to investigate how other universities that have a strong ethos of entrepreneurial, risk-taking behavior structure their tech transfer offices and policies. Interview participants noted Stanford, MIT, and Arizona State as potential forward-thinking universities to study. Gathering best practices and lessons learned from universities that are positive outliers in this capacity can help inform the capacities, processes and procedures that could help NUtech support faculty usage of the office. NUtech could then revise their policies and operations and collaborate with the university-wide unit from Recommendation 2 to identify and support promising faculty to engage.

It is possible the NUtech and the interdisciplinary unit described in the previous subsection could end up being a part of the same overall unit together. However, NUtech is a legacy office that has established ways of operating and its role is to provide only a portion of the support needed for entrepreneurial risk-taking behavior. Therefore, it will likely not be effective to expect NUtech to carry out overall solution without the university-wide unit from Recommendation 2. As noted previously, this study did not directly research NUtech, so these recommendations are based on the perceptions of faculty and what influences they reported could better support them to engage in entrepreneurial behavior.

**Recommendation 4: Adapt Faculty Incentives and Reward Structure**

Finally, while it would likely be the most difficult solution to implement, it is clear from the findings in Chapter 4 that UNL will need to adapt tenure and promotion guidelines to align with the N | 150 stated priority to “support a campus-wide ethos of informed risk taking” (University of Nebraska – Lincoln, 2019). Based on the findings, interview participants noted that the current incentive structure at UNL does not adequately support the desired ethos of risk-taking. This recommendation aligns with the work of Sanberg et al. who wrote that universities must “change from recognizing only basic research to rewarding use-oriented research, development, and commercialization as well” (p. 6547). It is important to note that the tenure and promotion system can continue to acknowledge the traditional path of research and publishing, while adding in elements that reward faculty who spend time applying that research. The intended outcome is that faculty feel comfortable engaging in this behavior knowing it is based on their research and it, too, will be considered and rewarded in promotion decisions. After realigning the incentive structure, the promotion evaluation processes must be reworked to align with the new structure.

Opening the incentive and reward structures to this type of mentality can also lead to changes in hiring practices, such that the university purposefully brings in people who value entrepreneurship and risk-taking. These people can then be a part of the cadre who engage in entrepreneurial, risk-taking activity, recognizing it will likely never be all faculty. However, having a group of these faculty who are encouraged in their entrepreneurial, risk-taking behavior spreads the ethos that it is supported, and therefore creates a more welcoming environment for others to engage.



Finally, adjusting tenure and promotion guidelines will likely be a longer-term process. This process will start with an internal research phase that includes listening to faculty from across UNL. This may be done in conjunction with the listening process associated with defining “informed risk-taking.” Given that tenure and promotion guidelines are fundamental to faculty positions, it will require a serious participatory process to gain buy-in. Interview participants noted that faculty often choose the academic career path because they are inherently risk-averse and the path from Ph.D. to tenured professor does not generally encourage risk-taking. Therefore, it is natural that many faculty members would not want to change the system that rewarded them on their own career trajectory. This challenge is the reason the tenure and promotion guidelines solution does not call for eliminating the traditional incentives but creating an additional pathway to reward those who do engage in entrepreneurial, risk-taking behavior. Given that over 70% of survey participants agreed to some extent that they would engage in entrepreneurial, risk-taking behavior more often if it were incentivized, there is potential that enough faculty see the benefits of altering the primary incentive structure at UNL to reward this behavior. However, due to the faculty committee structure and need for buy-in, it will likely be a challenge to change such fundamental policies.

UNL leadership will need to amend or develop new overarching priorities and guidelines for the tenure and promotion process to communicate with the Deans of each of the colleges. Next, the Deans will need to work with their faculty committees to workshop the tenure and promotion guidelines that are in effect in each college. Along with changing the guidelines, faculty committees will need to adjust how faculty evaluations are performed in alignment with the new guidelines. Finally, if necessary, various colleges may need to re-orient hiring practices to align with the new priorities, tenure and promotion guidelines, and evaluation practices.

Faculty participants had specific suggestions on how incentives and reward structures could be adjusted. First, both interview and survey participants highlighted the barrier of time allocations, so one suggestion was to adjust time requirements to allow for faculty to engage in this work, applying their research and developing connections outside of the university. Second, incentives could expand the service to society portion of the tenure and promotion guidelines, rather than focusing as heavily on publication. Finally, the guidelines could incorporate a way to value research that may have been published in a more interdisciplinary or practice-focused journal, though those journals may currently be considered less prestigious. With respect to maintaining current tenure and promotion incentives while including incentives for entrepreneurial behavior, these new incentives do not necessarily represent a separate, alternative path, but a widening of promotion behaviors that are encouraged. While these concrete suggestions emerged from this study, additional research that assesses the tenure and promotion guidelines of HEIs with exemplary models would be useful to understand best practices.

Because the intent of encouraging entrepreneurial behavior is to connect research and knowledge from within the university to the region, it is conceivable that a faculty member would spend some years focused on research and knowledge generation, followed by a period of applying their work through entrepreneurial activities. The same faculty member could then move on to new research and repeat the cycle or continue research while simultaneously finding external partners to apply past work. In this way, the tenure and promotion guidelines that incentivize the spirit of entrepreneurial risk-taking behavior would value both the generation of knowledge and the application of it.

### **Implementation Considerations**

Implementation of these four recommendations would require careful planning from university leadership. This section lays out a number of factors to take into account for implementation planning. Specifically, the following sections address resource requirements, timeline, and implementation constraints and challenges.

#### **Resource Requirements and Timing**

The initial work of creating a clear definition of “ethos of informed risk taking” will require leadership and staff time to engage with stakeholders and craft a clear definition, along with the time required from stakeholders across the university to share their input. It will also take time during leadership meetings to communicate the results of this work. Creating a university-wide unit will require funding to hire a qualified leader and offer programming to support faculty who participate. Additional human resource requirements in future years would likely be needed and would be contingent on the success of the unit. The initial phase of revamping NUtech, the research phase, will take leadership time and funding for travel to study other universities that have strong tech transfer offices. Out of this research phase, there is likely to be a need for additional funding to hire differently qualified leadership and improve operations. Depending on the findings of the research phase, over the long-term it may be a goal for this office to fund itself while also contributing to UNL’s revenue. The resource requirements here are less informed because this study did not include an in-depth analysis of NUtech’s leadership, budget, or operations. Finally, adjusting faculty incentives, including tenure and promotion guidelines, will require extensive faculty and leadership time over the course of a few years, which means extensive human capital investment.

As noted in the previous paragraph, faculty and leadership time is a primary resource requirement for these solutions overall. Considering the time it takes to gather input across the varied stakeholders at UNL, including staff across colleges, the work of creating a definition will likely take four to six months to complete. This definitional work must be completed before future steps can begin. Creating a new unit that is accountable for this initiative from the N | 150 report will likely take up to two years, inclusive of a year to build funding into the university-wide budget or get grant funding and define the mandate, up to four months to get a new leader onboarded, and another six to eight months for that leader to develop a strategic plan and move toward implementation and action. Revamping NUtech can likely occur simultaneously to developing the new unit. This solution will also likely take about two years, one year to do the research, around four months to hire and onboard a new leader, and another six to eight months to rewrite the policies and operations of this department. Finally, adjusting the tenure and promotion guidelines will likely be longer-term, based on the decentralized structure of UNL. It will likely take a year to listen to faculty across UNL followed by a year for university-wide leadership to synthesize the input, change university-wide guidelines, and communicate changes to all Deans. Then it will likely take two years for faculty committees to adjust the guidelines within each college, and finally another year or two to adjust evaluation practices. These steps sum to a total of five to six years. Table 11 summarizes the resource requirements and timeline to implement these recommendations.

**Table 11**

*Summary of recommendation resource requirements and timeline*

<b>Recommendation</b>	<b>Resource Requirements</b>	<b>Timeline</b>
1. Define and communicate the desired behavior.	<ul style="list-style-type: none"> <li>• Leadership and faculty time</li> <li>• Time for additional university stakeholders to share perspectives</li> </ul>	4 – 6 months
2. Build a university-wide unit to identify and support faculty who want to engage.	<ul style="list-style-type: none"> <li>• Funding to hire a qualified leader</li> <li>• Funding for programming to support faculty</li> </ul>	2 years
3. Revamp NUtech.	<ul style="list-style-type: none"> <li>• Leadership and staff time initially for research</li> <li>• Funding for enhanced operations</li> <li>• Potentially, additional funding for different leadership</li> </ul>	2 years
4. Adapt faculty incentives and reward structure.	<ul style="list-style-type: none"> <li>• Leadership and faculty time</li> <li>• Based on changes, funding shifts based on time allocations or other incentives / rewards</li> </ul>	5 – 6 years

### **Implementation Constraints and Challenges**

While the N | 150 vision report, which was developed and endorsed by leadership, states that it is a priority for UNL to “support a campus-wide ethos of informed risk taking,” there is no concrete evidence that current leadership prioritizes this specific initiative within the report. Therefore, for any of these solutions to be implemented, the senior leadership at UNL, including the chancellor, must recognize its importance and decide to act on it. While interview participants stated that leadership needs to show support for entrepreneurial, risk-taking behavior for it to happen, it is also critical in this case because the solutions are university-wide, not specific to individual colleges. Therefore, for the necessary budget and time to be devoted to these solutions, the senior leadership will need to prioritize this initiative among the many others in the N | 150 report.

Another constraint is the university budget. Funds will need to be reallocated from other priorities, which is difficult in any organization. Additionally, the costs associated with these solutions will not immediately and visibly lead to increased revenue. Therefore, the leadership will need to take a long-term view when considering allocating budget to these solutions, taking into account the future impact on the state of Nebraska, including perceived relevance of UNL to the community and advancements in social and economic development in the state through innovation and entrepreneurship coming out of UNL. As the findings in Chapter 4 indicate, faculty noted that increased entrepreneurial and risk-taking behavior among faculty can have a positive impact on the university's reputation. An enhanced reputation in turn could positively impact UNL's enrollment, advancement, and state appropriations. Also, if executed successfully, these solutions could lead to additional application of research and patents through entrepreneurship in Nebraska, potentially benefiting UNL financially.

Specific to adjusting tenure and promotion guidelines to encourage an "ethos of informed risk taking" among faculty, the key constraint will be faculty buy-in, discussed in the previous section. Finally, a key challenge will be getting past the inertia of how things have always been done. This challenge is not unique to UNL but widespread across HEIs in the United States (Christensen & Eyring, 2011; Layne & Lake, 2015). Changing an organizational culture is a gradual process that takes time. The solution regarding creating a new university-wide unit to support entrepreneurial, risk-taking behavior targets getting those who are inherently more risk-oriented to feel encouraged and supported. Incentives then change attitudes and behaviors more gradually over time, especially as the adjusted incentive structure may attract new hires that embody the desired ethos. Eventually, as more faculty exhibit entrepreneurial, risk-taking behavior and feel supported, more faculty will be successful in these endeavors and others will

see them as models, just as several interview participants highlighted the success of one prominent model currently on campus. Changing cultural settings, the concrete elements of an organizational culture, like its incentive structure, can have widespread changes on the intangible norms, or the culture models, that shape the behavior of those within the organization. It is through this process that UNL could create the desired “ethos of informed risk taking” as laid out in the N | 150 vision.

### **Evaluation Plan**

This study employs the evaluation framework developed by Kirkpatrick and Kirkpatrick (2006) to assess the progress of each recommendation. This framework uses four levels of evaluation to track the advancement from initial perceptions to long-term results. Each level builds on the outcomes of the previous level. The first level is reaction, which assesses how the intended stakeholders respond to the intervention. For example, if their opinion of the intervention is favorable or not. Tracking this level is important because it will impact the likelihood of stakeholders to be motivated to act. The second level of evaluation according to Kirkpatrick and Kirkpatrick’s (2006) framework is learning. This level assesses if the intended stakeholders “change attitudes, improve knowledge, and/or increase skill” because of the intervention (p. 22). People must understand what needs to be different before they can alter their behavior. Learning then leads to the third level, which evaluates changes in behavior as a result of the intervention. And finally, the fourth level seeks to assess the results that occurred due to the intervention. Results can only occur if behavior changes, finishing the progressive nature of each level building on the previous. This tiered evaluation framework can help leadership understand at which of the four levels implementation of the recommended solution breaks down

and hinders ultimate success. With this information, leadership can adjust implementation to address that specific gap (Kirkpatrick & Kirkpatrick, 2006).

The Kirkpatrick and Kirkpatrick (2006) evaluation framework can then be applied to each of the four recommendations proposed in this chapter. To assess progress associated with these recommendations, it will be useful for UNL to develop survey items that assess certain elements in the evaluation plan in the following tables. These items could be aggregated into one survey and potentially combined with another campus climate survey that faculty already complete. In general, a regular, baselined research tool designed to measure individual and university-wide openness to and engagement in entrepreneurial behavior would be valuable going forward to integrate annually with other data currently tracked by UNL. As highlighted in Chapter 1, this study relates directly to UNL's N | 150 report and the university's strategic goals. Therefore, many of the evaluation criteria in the fourth level, results, are taken directly from UNL's N | 150 report and its n2025 Strategic Plan. This ensures alignment between the recommendations and the university's overarching priorities. The evaluation plan associated with each recommendation contains a combination of new survey items, elements that the university already tracks, and elements that the university has already committed to tracking in either the n2025 Strategic Plan or the N | 150 report.

### **Evaluating Recommendation 1: Define and Communicate the Desired Entrepreneurial, Risk-Taking Behavior**

The key measure of success for this effort will be the development of a clear definition and faculty and staff awareness of this definition. Once leadership establishes a definition of desired behavior and carries out a comprehensive communications plan, evaluation of the recommendation according to the Kirkpatrick and Kirkpatrick (2006) four-level framework can



begin. UNL leadership can evaluate each level through survey items, specifically looking at change in faculty responses to those items over time as faculty become more familiar with and clear about the definition. Additionally, leadership can track behavior through engagement with university units that support entrepreneurship, such as the unit in the second recommendation. Media mentions, both quantity and tone, regarding faculty engagement in entrepreneurial, risk-taking behavior can also reveal how much traction this initiative receives in the broader community. In this way, media mentions could act as a proxy indicator of the university connecting to the community in Nebraska, which is one intended outcome of the desired behavior. The level four results also tie into the N | 150 report call to “track annual increases in faculty, staff, students, and alumni involved in mentorship, entrepreneurial ventures, and job creation” (University of Nebraska – Lincoln, Office of the Chancellor, 2020). Table 12 lays out the evaluation plan for this recommendation based on Kirkpatrick and Kirkpatrick’s (2006) framework.

**Table 12**

*Evaluation Plan for Recommendation 1*

Evaluation Levels (Kirkpatrick, 2006)	Evaluation Plan
Level 1: <i>Reaction</i> – How do participants react to the intervention?	<ul style="list-style-type: none"> <li>• Include survey item regarding staff reactions to the desired behavior of engaging entrepreneurial, risk-taking activities</li> <li>• Monitor Deans’ reactions during faculty meetings regarding this topic</li> </ul>
Level 2: <i>Learning</i> – Do participants “change attitudes, improve knowledge, an/or increase skill” (p.22) as a result?	<ul style="list-style-type: none"> <li>• Include survey item regarding faculty awareness and understanding of UNL leadership’s support of entrepreneurial, risk-taking behavior</li> <li>• Include survey item regarding faculty members’ own attitude toward engaging in entrepreneurial, risk-taking behavior</li> </ul>
Level 3: <i>Behavior</i> – Do participants change their behavior as a result?	<ul style="list-style-type: none"> <li>• Include survey item to track self-identified behavior in alignment with UNL’s definition of entrepreneurial, risk-taking activity</li> <li>• Track number of faculty who engage with the university-wide unit that supports these activities (see Solution 2 below)</li> </ul>

Table 12, continued

Evaluation Levels (Kirkpatrick, 2006)	Evaluation Plan
Level 4: <i>Results</i> – What are the results that occurred due to the intervention?	<ul style="list-style-type: none"> <li>• “Track annual increases in faculty, staff, students, and alumni involved in mentorship, entrepreneurial ventures, and job creation” (N150 Report)</li> <li>• Include a survey item regarding a campus-wide culture of willingness to take risks and adopt new behavior</li> <li>• Track media mentions and tone regarding UNL faculty engaging in the defined behavior</li> </ul>

## **Evaluating Recommendation 2: Build a University-Wide Unit to Identify and Support Entrepreneurial Faculty**

The key measure of success for this university-wide unit will be the stakeholder goal of this dissertation stated in Chapter 1: “By fall 2025, at least 10% of UNL faculty who have not previously done so will engage in entrepreneurial risk-taking behavior, using the functional definition put forth by Ahwireng-Obeng (1993), ‘a type of activity or practice with implications for generating jobs, fostering innovation and increasing productivity by means of which the creation of incomes and wealth is enhanced’ (p. 151).” Leadership could use process measures to ensure progress along the way, such as the creation of a budget line item at the university-level and onboarding a leader of this unit.

Indicators to evaluate the success of the unit itself will again use a four-level framework. While survey items are a part of this evaluation plan, the behavior measures relate primarily to the number of faculty who engage with this unit and partnerships created with external resources. All of the evaluation elements associated with the fourth level, results, link back to the n2025 Strategic Plan and N | 150 report. Specifically, one of the aims identified in the n2025 Strategic Plan states: “Focus research, scholarship, creative activity, and student experiences to foster innovative, interdisciplinary endeavors and solve challenges critical to Nebraska and the world”

(University of Nebraska – Lincoln, Office of the Chancellor, 2020). Many of the metrics associated with this aim will be directly impacted by implementation of this recommendation to build a university-wide unit to identify and support faculty who want to engage in entrepreneurial, risk-taking behavior. Table 13 lays out the four levels of the evaluation plan for this recommendation.

**Table 13**

*Evaluation Plan for Recommendation 2*

Evaluation Levels (Kirkpatrick, 2006)	Evaluation Plan
Level 1: <i>Reaction</i> – How do participants react to the intervention?	<ul style="list-style-type: none"> <li>• Include a survey item regarding faculty perception of this unit</li> <li>• Include a survey item regarding faculty perception of the resources available to engage in entrepreneurial, risk-taking behavior</li> <li>• Track the number of faculty who engage with this unit in any way (e.g., events, mentorship, etc.)</li> </ul>
Level 2: <i>Learning</i> – Do participants “change attitudes, improve knowledge, an/or increase skill” as a result?	<ul style="list-style-type: none"> <li>• Include a survey item regarding faculty understanding the steps necessary to engage in entrepreneurial behavior through their interaction with this unit</li> <li>• Track the number of faculty who identify themselves as wanting to connect with the cadre of faculty interested in entrepreneurial activities</li> </ul>
Level 3: <i>Behavior</i> – Do participants change their behavior as a result?	<ul style="list-style-type: none"> <li>• Track the number of faculty who connect with an external partner through this unit</li> <li>• Include survey item to track self-identified behavior in alignment with the definition of entrepreneurial, risk-taking activity (same as earlier solution)</li> </ul>

Table 13, continued

Evaluation Levels (Kirkpatrick, 2006)	Evaluation Plan
<p>Level 4: <i>Results</i> – What are the results that occurred due to the intervention?</p>	<ul style="list-style-type: none"> <li>• “Measuring the impact of our research and creative activity on society through the number of solutions to grand challenges and major societal problems; the number of improved practices; and number and diversity of people and communities helped” (N150 report)</li> <li>• “All faculty, post-doctoral fellows, staff and students have a mentor or advisor and all evaluations include reporting of mentorship activities” (n2025 Strategic Plan) (<i>Note: linked to specific finding on need for mentorship to increase entrepreneurial, risk-taking behavior</i>)</li> </ul> <p>From the n2025 Strategic Plan aim: “Focus research, scholarship, creative activity, and student experiences to foster innovative, interdisciplinary endeavors and solve challenges critical to Nebraska and the world”</p> <ul style="list-style-type: none"> <li>• “Increased number and diversity of individuals, teams (faculty, staff, post-doctoral fellows, and students), and centers working on high priority [interdisciplinary] challenges”</li> <li>• “Increased investments (financial resources and facilities) in successful [interdisciplinary] teams and centers”</li> <li>• “Evaluation system developed and implemented to ensure continued productivity of successful interdisciplinary centers and units”</li> <li>• “Increased number of national and international collaborations in Grand Challenge areas”</li> <li>• “Increased number of interdisciplinary scholarly products (proposals, grants, publications, <i>creative works</i>)” (emphasis added)</li> <li>• “Increased number of tenure-track faculty apportioned to interdisciplinary centers and units”</li> <li>• “Grand Challenge topics for Nebraska established and resources committed to them”</li> <li>• “Structures and systems established to support research and creative activities aligned with Grand Challenges”</li> </ul>

### Evaluating Recommendation 3: Revamp NUtech

Initial measures of success associated with a revamped NUtech would involve process steps, such as completing of the research phase and altering the policies and guidelines that NUtech uses in its work with faculty. Similarly to the previous recommendation, while the first

two levels of the evaluation plan would rely on survey items, levels three and four will rely more on tracking the level of activity of faculty engagement with NUtech and subsequent outcomes of that engagement, such as patents filed, licensed, or IP otherwise applied to external endeavors. The fourth level also relates to specific metrics identified by the n2025 Strategic Plan. Long-term, UNL leadership could set ambitious revenue targets. Table 14 lays out the evaluation plan for the third recommendation to revamp NUtech.

**Table 7***Evaluation Plan for Recommendation 3*

Evaluation Levels (Kirkpatrick, 2006)	Evaluation Plan
Level 1: <i>Reaction</i> – How do participants react to the intervention?	<ul style="list-style-type: none"> <li>• Include a survey item regarding faculty perception of NUtech overall</li> <li>• Track the number of faculty across colleges and departments (especially outside of agriculture) who engage with NUtech</li> </ul>
Level 2: <i>Learning</i> – Do participants “change attitudes, improve knowledge, an/or increase skill” as a result?	<ul style="list-style-type: none"> <li>• Include a survey item regarding faculty perception of NUtech’s ability to support the use of their research</li> <li>• Include a survey item regarding faculty understanding that NUtech is one potential step in the process of connecting their research to the community</li> </ul>
Level 3: <i>Behavior</i> – Do participants change their behavior as a result?	<ul style="list-style-type: none"> <li>• Track the number of faculty who contact NUtech to assist with filing a patent or otherwise commercializing their IP</li> <li>• Assess changes that NUtech staff make to their protocol for making deals with faculty IP</li> </ul>
Level 4: <i>Results</i> – What are the results that occurred due to the intervention?	<ul style="list-style-type: none"> <li>• Track the number of deals completed with external partners through NUtech that utilize UNL faculty IP</li> <li>• “Increased number of patents, copyrights, licensing, and research-based start-up companies” with the specific target to “Increase the number of U.S. patents issued by 70% and the number of licenses executed by 50%” (n2025 Strategic Plan)</li> <li>• “Form seven research-based start-up companies annually, based on university technologies” (n2025 Strategic Plan)</li> <li>• Increased revenue for faculty and the university from IP applications</li> </ul>

**Evaluating Recommendation 4: Adapt Faculty Incentives and Reward Structure**

Regarding overall implementation of this recommendation, the primary success metric for accomplishing this solution would be approved tenure and promotion guidelines that provide a path to reward entrepreneurial, risk-taking behavior among faculty. Intermediate success could be tracked as university leadership and each college change relevant tenure and promotion guidelines. Long-term, the adjusted incentives are intended to impact the overall performance goal of increasing faculty engagement in entrepreneurial, risk-taking behavior.

Given that implementation of this recommendation may be particularly delicate, the four levels of Kirkpatrick and Kirkpatrick's (2006) evaluation framework will be critical to help identify where and when a breakdown occurs to develop an appropriate solution. While evaluation of levels one and two include just two survey items each, faculty perception and attitudes will be important to track to successfully move forward. Like the other recommendations, the higher levels of evaluation link directly to the n2025 Strategic Plan and N | 150 report, ensuring close alignment with UNL's stated long-term goals. Table 15 lays out the evaluation plan for the fourth recommendation, to adapt the faculty incentives and reward structures to incentivize the desired entrepreneurial, risk-taking behavior identified through implementation of the first recommendation.

**Table 85***Evaluation Plan for Recommendation 4*

Evaluation Levels (Kirkpatrick, 2006)	Evaluation Plan
Level 1: <i>Reaction</i> – How do participants react to the intervention?	<ul style="list-style-type: none"> <li>• Include a survey item regarding faculty perceptions of the amendments to faculty incentives and rewards to encourage entrepreneurial, risk-taking behavior</li> <li>• Include a survey item regarding faculty perception to the added element related to entrepreneurial, risk-taking activity in their annual activity report completed for tenure and promotion</li> </ul>
Level 2: <i>Learning</i> – Do participants “change attitudes, improve knowledge, an/or increase skill” as a result?	<ul style="list-style-type: none"> <li>• Include a question during annual review discussions with faculty to gauge if faculty understand on what they are measured and how they are measured regarding this behavior</li> <li>• Include a survey item to assess faculty members’ likelihood to engage in entrepreneurial, risk-taking activity based on the adapted incentives and reward structure</li> </ul>
Level 3: <i>Behavior</i> – Do participants change their behavior as a result?	<ul style="list-style-type: none"> <li>• Include survey item to track self-identified behavior in alignment with the definition of entrepreneurial, risk-taking activity (same as earlier solution)</li> <li>• “Increase the number of faculty participating in extramurally-funded research, scholarship, and <i>creative activity</i> by 5% annually on a three-year rolling average” (n2025 Strategic Plan) (emphasis added)</li> <li>• “Documenting year over year increases in mutually beneficial partnerships with our community partners” (N150 Report)</li> </ul>
Level 4: <i>Results</i> – What are the results that occurred due to the intervention?	<ul style="list-style-type: none"> <li>• The completion of “Annual review and promotion documents that value and reward collaboration and interdisciplinary work” (n2025 Strategic Plan)</li> <li>• The completion of “UNL apportionment guidelines and staff position descriptions and evaluation criteria revised to include engagement”</li> <li>• Track increase in “the number of opportunities our students have for experiential learning within the community” (N150 Report)</li> <li>• “Increase the number of faculty apportioned to do research, scholarship, and <i>creative activity</i> by 5% annually on a three-year rolling average” (n2025 Strategic Plan) (emphasis added)</li> </ul> <p data-bbox="503 1444 1433 1507">From the n2025 Strategic Plan aim: “Broaden Nebraska’s engagement in community, industry, and global partnerships”</p> <ul style="list-style-type: none"> <li>• “UNL apportionment guidelines and staff position descriptions and evaluation criteria revised to include engagement” with the target of a “10% annual increase in percentage of faculty members with an engagement apportionment”</li> <li>• “Increased number of and impact on community, industry, and global partners”</li> <li>• “Carnegie Community Engagement achieved”</li> <li>• “Improved infrastructure and professional development to promote communication, applied research, and sharing of knowledge”</li> </ul>

While this evaluation plan may seem daunting, much of it relates directly to UNL's previously stated goals and metrics and relies heavily on survey items that could be included in an existing annual faculty survey. Additionally, as UNL achieves success on many of these dimensions, university public relations and communications can use the metrics to demonstrate to the community and the state government the extent to which UNL contributes to the region.

### **Limitations and Future Research**

One key limitation of this research was restricted engagement from the university regarding access to faculty names and email addresses for the survey list. Therefore, the survey list came from public, online faculty lists that may be outdated or otherwise not accurate. Second, the original design of the study focused on tenured and tenure-track faculty, so the survey did not collect data on Professors of Practice and other faculty who were not tenured or tenure-track. However, the interview participants identified by the collaborator did include non-tenure-track faculty, and those faculty indicated that the Professor of Practice role did lend itself to more entrepreneurial work. Therefore, another limitation is the lack of Professor of Practice data specifically from the survey, given the value of the interview data from Professors of Practice.

The scope of this study included influences that could increase faculty engagement in entrepreneurial, risk-taking behavior at a land grant, research-based university. Future research could examine the efficacy of these recommendations, both short-term in increasing the incidence of faculty risk-taking behavior and long-term in how increased entrepreneurial behavior impacts regional development and university sustainability. Additionally, future research could examine the factors that influence a culture of willingness to take risks in other types of higher education settings, such as private colleges, public, non-research-based



institutions, and others. The recommendations outlined in this chapter also suggest research on the policies and operations of tech transfer offices and the incentive and rewards structures at other universities, such as MIT and Stanford, that seem to encourage faculty engagement in entrepreneurial activity. Similarly, a study that examines the tenure or promotion guidelines of other universities that encourage entrepreneurial, risk-taking behavior to understand how they differ would be a next step to understand best practices on that dimension.

### **Conclusion**

This innovation study sought to understand how UNL could address the initiative stated in the N | 150 report, to “support a campus-wide ethos of informed risk taking” (University of Nebraska – Lincoln, 2019). To that end, the study identified a specific stakeholder goal that by 2025, UNL will serve as a catalyst for growth and prosperity for Nebraska through a 10% increase in occurrence of UNL faculty engaging in entrepreneurial risk-taking behaviors. For entrepreneurial risk-taking behaviors, this study used the functional definition put forth by Ahwireng-Obeng (1993), “a type of activity or practice with implications for generating jobs, fostering innovation and increasing productivity by means of which the creation of incomes and wealth is enhanced” (p. 151). The research included interviews with faculty members who are positive examples of those who engage in entrepreneurial, risk-taking and a survey sent to all faculty members. Through this data, 12 influences emerged as gaps where innovation would need to occur at UNL to successfully achieve the stakeholder goal, and ultimately the initiative from the N | 150 report. Chapter 5 then laid out four recommendations, relating primarily to organizational factors, to address these gaps, along with an evaluation plan to track progress.

Overall, approximately half of faculty survey respondents reported that they engage in entrepreneurial, risk-taking activity as defined by this study. Yet interview participants indicated

that they engage in this type of behavior despite the ethos on campus, not because of it. While faculty generally understand the benefits of engaging in such behavior, many lack the procedural knowledge of how to engage in it. They also feel that organization policies, such as tenure and promotion, hinder such activity, but that should these policies be adjusted, they would engage in this behavior more often. As interview participants noted, there will never be a time when all faculty choose to engage in such behavior. However, there is a cadre of faculty that orients toward this behavior, and the university can grow that cadre by identifying and supporting those who want to engage, as well as changing incentives to support faculty engagement in the desired entrepreneurial, risk-taking behavior.

While improving incentives for faculty can increase individual behavior, the ultimate intention for increased entrepreneurial, risk-taking behavior is a positive impact on social and economic develop in Nebraska. Achieving the stakeholder goal of this study over time will help UNL better fulfill its mission, its responsibility as a land grant institution, and societal expectation in an increasingly knowledge-based economy. An enhanced reputation can lead to positive benefits, such as increased enrollment or research funding. As many universities face challenges of sustainability and public perception, not working toward the innovations outlined in this study could have dire long-term consequences. Ultimately, catalyzing regional development can prove UNL's importance and be a strong case for investment in the institution for generations to come.

## REFERENCES

- Abreu, M., & Grinevich, V. (2013). The nature of academic entrepreneurship in the UK: Widening the focus on entrepreneurial activities. *Research Policy, 42*(2), 408–422.  
doi:10.1016/j.respol.2012.10.005
- Ahwireng-Obeng, F. (1993). Gender, entrepreneurship and socioeconomic reparation in South Africa. *The Review of Black Political Economy, 22*(2), 151–165.  
<https://doi.org/10.1007/BF02689948>
- Akgün, A., Lynn, G., & Byrne, J. (2006). Antecedents and Consequences of Unlearning in New Product Development Teams. *Journal of Product Innovation Management, 23*(1), 73–88.  
<https://doi.org/10.1111/j.1540-5885.2005.00182>
- Ambrose, S. A., Bridges, M. W., DiPietro, M., Lovett, M. C., & Norman, M. K. (2010). *How learning works*. San Francisco, CA: Jossey-Bass.
- Anderson, L. W., & Krathwohl, D. R. (Eds.) (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. New York, NY: Longman.
- AUTM. (2017). *AUTM US Licensing Activity Survey: 2017*. Hockstad, D., Mahurin, R., Miner, J., Porter, K., Robertson, R., & Savatski, L. (Eds.). Retrieved from  
[https://autm.net/AUTM/media/SurveyReportsPDF/AUTM\\_2017\\_US\\_Licensing\\_Survey\\_no\\_appendix.pdf](https://autm.net/AUTM/media/SurveyReportsPDF/AUTM_2017_US_Licensing_Survey_no_appendix.pdf)
- Bandura, A. (1986). The explanatory and predictive scope of self-efficacy theory. *Journal of Clinical and Social Psychology, 4*, 359-373.
- Birch, D. (1987). *Job creation in America: how our smallest companies put the most people to work*. New York, NY: Free Press.

- Brettel, M., Chomik, C., & Flatten, T. (2015). How organizational culture influences innovativeness, proactiveness, and risk-taking: Fostering entrepreneurial orientation in SMEs. *Journal of Small Business Management*, 53(4), 868-885.  
<https://doi.org/10.1111/jsbm.12108>
- Chrisman, J., Hynes, T., & Fraser, S. (1995). Faculty entrepreneurship and economic development: The case of the University of Calgary. (International Entrepreneurship, New Business Development, Technology, and Innovation). *Journal of Business Venturing*, 10(4), 267. [https://doi.org/10.1016/0883-9026\(95\)00015-Z](https://doi.org/10.1016/0883-9026(95)00015-Z)
- Christensen, C., & Eyring, H. (2011). *The innovative university changing the DNA of higher education from the inside out*. New York, NY: Wiley.
- Christensen, C. M., & Overdorf, M. (2000). Meeting the challenge of disruptive change. *Harvard Business Review*, 78(2), 66. <https://hbr.org/2000/03/meeting-the-challenge-of-disruptive-change>
- Clark, R. E., & Estes, F. (2008). *Turning research into results: A guide to selecting the right performance solutions*. Atlanta, GA: CEP Press.
- Corbin, J., & Strauss, A. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (3rd ed.). Thousand Oaks, CA: SAGE.
- Daly, E. (2010). *Behaviorism*. Retrieved from Education.com
- Drucker, P. (1998). The discipline of innovation. *Harvard Business Review*, 76(6), 149–157.  
Retrieved from <http://search.proquest.com/docview/227768472/>
- Etzkowitz, H. (1998). The norms of entrepreneurial science: cognitive effects of the new university-industry linkages. *Research Policy*, 27(8), 823–833.

- Etzkowitz, H., Webster, A., Gebhardt, C., & Terra, B. R. C. (2000). The future of the university and the university of the future: Evolution of ivory tower to entrepreneurial paradigm. *Research Policy*, 29(2), 313–330.
- Floyd, S., & Wooldridge, B. (1999). Knowledge creation and social networks in corporate entrepreneurship: The renewal of organizational capability. *Entrepreneurship Theory and Practice*, 23(3), 123–144. <https://doi.org/10.1177/104225879902300308>
- Gallimore, R., & Goldenberg, C. (2001). Analyzing cultural models and settings to connect minority achievement and school improvement research. *Educational Psychologist*, 36(1), 45–56.
- Gino, F. (2018). The business case for curiosity. (Spotlight: Curiosity). *Harvard Business Review*, 96(5), 48–57.
- Glesne, C. (2011). *Becoming qualitative researchers: An introduction* (4th ed.). Boston, MA: Pearson.
- Goldstein, H., & Glaser, K. (2012). Research universities as actors in the governance of local and regional development. *The Journal of Technology Transfer*, 37(2), 158–174. <https://doi.org/10.1007/s10961-010-9193-4>
- Goldstein, H., Maier, G., & Luger, M. (1995) The university as an instrument for economic and business development: US and European comparisons, In Dill, D., Sporn, B. (Eds.) *Emerging patterns of social demand and university reform: Through a glass darkly* (p. 244). New York, NY: Pergamon,
- Goldstein, H. A. (2010). The “entrepreneurial turn” and regional economic development mission of universities. *Annals of Regional Science*, 44(1), 83–109.

- Hamel, G., & Valikangas, L. (2003). The quest for resilience. *Harvard Business Review*, 81(9), 52–63. Retrieved from <http://search.proquest.com/docview/227766646/>
- Hayton, J. (2005). Promoting corporate entrepreneurship through human resource management practices: A review of empirical research. *Human Resource Management Review*, 15(1), 21–41. <https://doi.org/10.1016/j.hrmr.2005.01.003>
- Hoeveler, J. (1976). The university and the social gospel: The intellectual origins of the "Wisconsin Idea". *The Wisconsin Magazine of History*, 59(4), 282-298. Retrieved from <http://www.jstor.org.libproxy2.usc.edu/stable/4635070>
- Johnson, B., & Christensen, L. (2017). *Educational research: Quantitative, qualitative, and mixed approaches* (Sixth edition.). Thousand Oaks, CA: SAGE.
- Jones, Jeffery. (2018, October 9). *Confidence in higher education down since 2015* [blog post]. Retrieved from <https://news.gallup.com/opinion/gallup/242441/confidence-higher-education-down-2015.aspx>
- Khorrani, M., Farhadian, H., & Abbasi, E. (2018). Determinant competencies for emerging educators' entrepreneurial behavior in the Institute of Agriculture Applied-Scientific Education, Iran. *Journal of Global Entrepreneurship Research*, 8(8), 1-11. <https://doi.org/10.1186/s40497-018-0096-4>
- Kirkpatrick, D. & Kirkpatrick, J. (2006). *Evaluating training programs: The four levels* (3rd Edition). San Francisco, CA: Brett Koehler..
- Layne, P., & Lake, P. (2015). Global Innovation of Teaching and Learning in Higher Education [electronic resource] : Transgressing Boundaries / edited by Prudence C. Layne, Peter Lake. (Professional Learning and Development in Schools and Higher Education; 11).

Leal-Rodríguez, A., Eldridge, S., Roldán, J., Leal-Millán, A., & Ortega-Gutiérrez, J. (2015).

Organizational unlearning, innovation outcomes, and performance: The moderating effect of firm size. *Journal of Business Research*, 68(4), 803–809.

<https://doi.org/10.1016/j.jbusres.2014.11.032>

Lee, M. (2019, May 27). *Governor approves state budget, including NU funding*. Retrieved from: <https://news.unl.edu/newsrooms/today/article/governor-approves-state-budget-including-nu-funding/>

Marshall, S. (2011). Change, technology and higher education: Are universities capable of organisational change? *Journal of Asynchronous Learning Networks*, 15(4), 22–34. Retrieved from <http://search.proquest.com/docview/964188618/>

Martin, B., McNally, J., & Kay, M. (2013). Examining the formation of human capital in entrepreneurship: A meta-analysis of entrepreneurship education outcomes. *Journal of Business Venturing*, 28(2), 211–224. doi:10.1016/j.jbusvent.2012.03.002

Maxwell, J. A. (2013). *Qualitative research design: An interactive approach*. Thousand Oaks, CA: Sage.

Merriam, S. B. & Tisdell, E. J. (2016). *Qualitative research: A guide to design and implementation* (4th ed.). San Francisco, CA: Jossey-Bass.

National Academy of Inventors. (2013). Would Thomas Edison receive tenure? Conference panel discussion recorded on February 22, 2013 (Univ of South Florida, Tampa, FL). Available at [www.youtube.com/watch?v=dQr3eE7K8W4](http://www.youtube.com/watch?v=dQr3eE7K8W4)

National Center for Education Statistics. (2017). *Digest of education statistics: 2017*. Washington, DC: Author.

National Center for Education Statistics. (2019). *The condition of education*. Washington, DC:

Author.Nelles, J., & Vorley, T. (2011). Entrepreneurial architecture: a blueprint for entrepreneurial universities. *Canadian Journal of Administrative Sciences*, 28(3), 341–353.

NUtech Ventures. (2020). Retrieved from <https://www.nutechventures.org/>

The Office of the Associate Provost for Faculty Affairs. (2012). *Promoting an Inclusive View of Scholarship* (Univ of Arizona, Tucson, AZ). Available May 30, 2019 from

<http://facultyaffairs.arizona.edu.libproxy2.usc.edu/sites/default/files/promotinganinclusivewiewofscholarshipappc.pdf>.Patton, M. Q. (2002). *Qualitative research & evaluation methods* (3rd ed.). Thousand Oaks, CA: SAGE.

Peris-Ortiz, M. (2009). An analytical model for human resource management as an enabler of organizational renewal: a framework for corporate entrepreneurship. *International Entrepreneurship and Management Journal*, 5(4), 461–479.

<https://doi.org/10.1007/s11365-009-0119-2>

Perkins, J. (1973). *The university as an organization*. New York, NY: McGraw-Hill.

Robinson, S. B., & Leonard, K. F. (2019). *Designing quality survey questions*. Thousand Oaks: CA: SAGE.

Rubin, H. J., & Rubin, I. S. (2012). *Qualitative interviewing: The art of hearing data* (3rd ed.). Thousand Oaks, CA: SAGE.

Rueda, R. (2011). *The 3 dimensions of improving student performance: Finding the right solutions to the right problems*. New York, NY: Teachers College Press.

Sanberg, P., Gharib, M., Harker, P., Kaler, E., Marchase, R., Sands, T., ... Sarkar, S. (2014).

Changing the academic culture: Valuing patents and commercialization toward tenure and



- career advancement. *Proceedings of the National Academy of Sciences of the United States of America*, 111(18), 6542–6547. <https://doi.org/10.1073/pnas.1404094111>
- Saiz-Santos, M., Araujo-De la Mata, A., & Hoyos-Iruarrizaga, J. (2017) Entrepreneurial university: Educational innovation and technology transfer. In Peris-Ortiz, M., Gomez, J.A., Merigo-Lindahl, J., Rueda-Armengot, C. (Eds.) *Entrepreneurial universities, Exploring the academic and innovative dimensions of entrepreneurship in higher education*.(pp. 105-121). Cham: Springer International. <https://doi.org/10.1007/978-3-319-47949-1>
- Schmitz, A., Urbano, D., Dandolini, G. A., & de Souza, J. A. (2017). Universities in the context of the knowledge-based society according to systemism: Evidences from a Brazilian Community University. In Peris-Ortiz M., Gómez J., Merigó-Lindahl J., Rueda-Armengot C. (Eds.) *Entrepreneurial Universities. Innovation, Technology, and Knowledge Management* (pp. 83-104). Washintgon DC: Springer.
- Schunk, D., Meece, J., & Pintrich, P. (2014). *Motivation in education: Theory, Research, and Applications* (4<sup>th</sup> ed.). New York, NY: Pearson.
- Seltzer, R. (2018). Moody's: Private-college closures at 11 per year. Retrieved from <https://www.insidehighered.com/quicktakes/2018/07/25/moodys-private-college-closures-11-year>
- Sternberg, R. (2014). *The modern land-grant university*. West Lafayette, Indiana: Purdue University Press.
- Strada Education Network & Gallup Organization. (2018). *From college to life: Relevance and the value of higher education*. Retrieved from: <https://www.stradaeducation.org/report/from-college-to-life/>

- University of Nebraska – Lincoln. (2018). *Fact book 2017-2018*. Retrieved from [https://iea.unl.edu/publications/fb17\\_18.pdf](https://iea.unl.edu/publications/fb17_18.pdf)
- University of Nebraska – Lincoln. (2019). *About IANR*. Retrieved from <https://ianr.unl.edu/about-ianr>
- University of Nebraska – Lincoln. (2019). *Employee Headcount by Age or Ethnicity, Gender, College, Department, and Rank - Fall 2019*. Retrieved from <https://insight.nebraska.edu/t/Public/views/DataIndex/EmployeeHeadcountbyAgeorEthnicityGenderCollegeDepartmentandRankTable200s?:isGuestRedirectFromVizportal=y&embed=y>
- University of Nebraska – Lincoln. (2019). *Nebraska 150 Commission final report*. Unpublished manuscript.
- University of Nebraska – Lincoln, Office of the Chancellor. (2020). *N2025 Strategic Plan*. <https://www.unl.edu/chancellor/n2025-strategic-plan#strategic-plan>
- U.S. Department of Education. (2006). *A test of leadership: Charting the future of U.S. higher education* (DOE Contract No. ED-06-C0-0013). Retrieved from <https://www2.ed.gov/about/bdscomm/list/hiedfuture/reports/pre-pub-report.pdf>
- Urbano, D., & Guerrero, M. (2013). Entrepreneurial universities: Socioeconomic impacts of academic entrepreneurship in a European region. *Economic Development Quarterly*, 27(1), 40-55.
- Van Dam, K., Schipper, M., & Runhaar, P. (2010). Developing a competency-based framework for teachers' entrepreneurial behaviour. *Teaching and Teacher Education*, 26(4), 965–971. <https://doi.org/10.1016/j.tate.2009.10.038>

- Wood, M. (2011). A process model of academic entrepreneurship. *Business Horizons*, 54(2), 153-161. doi:10.1016/j.bushor.2010.11.004
- Wright, M. (2014). Academic entrepreneurship, technology transfer and society: Where next? *Journal of Technology Transfer*, 39(3), 322-334. doi:10.1007/s10961-012-9286-3
- Zahra, S., Nielsen, A., & Bogner, W. (1999). Corporate entrepreneurship, knowledge, and competence development. *Entrepreneurship Theory and Practice*, 23(3), 169–189. <https://doi.org/10.1177/104225879902300310>

## APPENDIX A: SURVEY INSTRUMENT

1. Please indicate your current position at UNL (check all that apply):
  - Professor
  - Associate Professor
  - Assistant Professor
  - Professor / Associate / Assistant of Practice (*terminate survey*)
  - Adjunct Professor/Lecturer/Instructor (*terminate survey*)
  - Other non-tenure-track faculty position (*terminate survey*)
  - Departmental Chair
  - Administrative staff – manager (*terminate survey*)
  - Administrative staff – non-manager (*terminate survey*)
  
2. How many years have you worked at UNL? \_\_\_\_\_
  
3. In which of the colleges do you work? (check all that apply)
  - Agricultural Sciences and Natural Resources
  - Architecture
  - Arts and Sciences
  - Business
  - Education and Human Sciences
  - Engineering
  - Hixson-Lied College of Fine and Performing Arts
  - Graduate Studies
  - Journalism and Mass Communications
  - Law
  
4. What is your gender?
  - Female
  - Male
  - Transgender
  - Nonbinary

This study focuses on entrepreneurial behavior related to applying innovation and taking risks. This definition includes traditional entrepreneurial activities, such as tech transfer and starting companies, as well as a broader set of behaviors related to operationalizing research and utilizing expertise beyond the university toward the fulfillment of the university's mission to "positively transform lives, land, and society" in Nebraska. In other words, this study includes any behavior on the part of a faculty member who seeks to connect their work to:

- Spur development in Nebraska (e.g., generate jobs, increase productivity, foster innovation)
- Advance company, nonprofit, or government work, which in turn advances regional development

Illustrative examples of this behavior could include a faculty member from any discipline:

- Applying research evidence to help a company improve technology or streamline operations
- Utilizing research evidence to help a non-profit improve its work
- Providing expertise to government officials to shape policy decisions

Conversely, this study does not include innovations and risk-taking behavior intended to have impact within the university, such as designing new curriculum or creating a new course.

For the following items, please indicate to what extent do you agree with the following statements:

1. Strongly disagree
  2. Disagree
  3. Slightly disagree
  4. Slightly agree
  5. Agree
  6. Strongly agree
- 
5. I have engaged in entrepreneurial activity as defined by this study.
  6. I believe that I could be successful at engaging in entrepreneurial activity.
  7. I understand the steps necessary for me to engage in entrepreneurial activity.
  8. When it proves difficult to apply my research to practical solutions, I can figure out how to do it.
  9. Engaging in entrepreneurial activity is not worth my time.
  10. If I attempt entrepreneurship and it is not successful, it will hurt my reputation within the university.
  11. The university supports a culture of willingness to take risks and adopt new behavior, specifically related to entrepreneurship.
  12. If I try to engage in entrepreneurial behavior and it is not successful, it will hurt my professional standing at the university, including progress toward tenure.
  13. I would engage in entrepreneurial activity more often if I would be rewarded through faculty incentive structures.
  14. The university offers dedicated services (e.g., a Center, workshops, patent or legal support, etc.) to support faculty in entrepreneurial activity.

15. The university has promoted the resources available to support faculty entrepreneurial activity.
16. I would like more support connecting my research to industry.
17. Engaging in entrepreneurial activity is not part of my job as a faculty member.
18. What are the benefits to engaging in entrepreneurial activity? (select all that apply)
- Personal interest
  - Finding solutions for problems
  - Deeper understanding of my research findings
  - Personal financial gain
  - Financial gain for the university
  - Regional economic development
  - Other, please specify (open-ended)
19. What do you see as the key barriers to your engagement in entrepreneurial activity?  
Faculty... (select all that apply)
- Lack the knowledge regarding how to go about it
  - Lack of skills needed
  - Do not see it as part of their job responsibility
  - Do not believe it is worth the effort
  - Do not think they could be successful at it
  - Believe that an unsuccessful attempt could hurt their chances at promotion
  - Believe that an unsuccessful attempt could hurt their reputation
  - Do not have sufficient resources
  - Do not have sufficient time
  - Other, please specify (open-ended)
20. What is the cost-benefit analysis to pursuing entrepreneurial behavior? (open-ended)
21. What can UNL do to encourage entrepreneurial activity? (open-ended)
22. What additional support would be useful to help you engage in entrepreneurial activity?  
(open-ended)
23. What might it look like for UNL to incentivize entrepreneurial behavior? (open-ended)
24. Would you be willing to participate in an interview regarding entrepreneurial behavior at UNL? If so, please provide your email address.

## APPENDIX B: INTERVIEW QUESTIONS

1. What do you think are the potential benefits to faculty to engaging in entrepreneurship?
  - [If needed, probe on:
    - Personal interest
    - Personal financial gain
    - Financial gain for the university
    - Finding solutions to problems
    - Regional economic development
  - Based on your response, tell me about why you engage in entrepreneurial activity, if at all.
  - [If he/she doesn't] Tell me about why you do not engage in entrepreneurial activity.
2. From your experience, what are the barriers to pursuing entrepreneurial activity among faculty?
3. What skills do you believe are needed to engage in entrepreneurial behavior?
  - Where did you learn these skills, if anywhere?
4. Tell me about a time that you applied your research findings outside of the university, if any.
  - [If yes] How did you go about that?
    - How did you decide on what finding to apply?
  - [If no] If you were to apply your research findings outside of the university, how would you go about that? Walk me through the steps.
5. Tell me about a relationship that you have outside of UNL that is related to your research.
  - [If yes] How did you connect with that person?
    - How did you initially develop the relationship?
    - How did you advance the relationship to a collaboration or partnership?
    - How successful has that partnership been? Why?
    - If a colleague wanted insight into how to build similar relationships with an external partner, what would you advise?
  - [If no] If you were to develop an external partner for your research, how would you go about that?
6. Let's say a colleague came to you and asked how to go about engaging in entrepreneurial activity, what would you tell them they need to do first?
  - What would you tell them to do next? (etc.)
7. How do you feel about your ability to be successful engaging in entrepreneurial activity?
  - [Potential probe:] Tell me about a time when you thought to yourself "I know how to do this!"

8. Have you ever been in a situation when your entrepreneurial endeavor was not progressing as you would hope, and you had to change course? If so, what did you do in that situation?
9. What do you see as the cost-benefit analysis to pursuing entrepreneurial behavior?
  - [Probe on cost value: effort, reputational risk]
10. What, if anything, has the university communicated about faculty taking risks with entrepreneurial activity?
  - Do faculty trust that pursuing entrepreneurial behavior will not diminish their professional standing?
  - What would it look like for the university to create an environment that supports entrepreneurial activity?
  - Given this [answer above], What do you think UNL can do to better to cultivate an environment where faculty take risks with entrepreneurial activity?
11. Tell me what organizational incentives exist for faculty to engage in entrepreneurial behavior, if any.
  - What might it look like for the university to incentivize entrepreneurial behavior?
  - What changes to the current incentive structure would be necessary?
12. *[Document analysis in advance to know what resources UNL offers]* Which of the university's resources related to entrepreneurship do you utilize, if any?
  - [If yes:] How useful are these resources for you?
    - What additional support would be useful to help you engage in entrepreneurial activity?
  - [If none:] Why do you not use any of these resources?
    - What resources do you think the university could offer that you would use, if any?
13. Thinking more generally, what do you think could help increase entrepreneurship or risk-taking among faculty at UNL?



## APPENDIX C: INFORMATION SHEET FOR INTERVIEW PARTICIPANTS

University of Southern California  
Rossier School of Education  
Waite Phillips Hall  
3470 Trousdale Parkway  
Los Angeles, CA 90089

**Increasing Faculty Engagement in Entrepreneurial Risk-taking  
Behavior to Advance Regional Economic Development: An Innovation Study**

You are invited to participate in a research study. Research studies include only people who voluntarily choose to take part. This document explains information about this study. You should ask questions about anything that is unclear to you.

**PURPOSE OF THE STUDY**

This research study aims to understand how to foster entrepreneurial risk-taking behavior among faculty at the University of Nebraska-Lincoln (UNL). The study is intended to support the initiative from the N150 Final Commission Report to address how UNL can effectively “support a campus-wide ethos of informed risk taking.”

**PARTICIPANT INVOLVEMENT**

If you agree to take part in this study, you will be asked to participate in an hour-long, audio-recorded interview. You do not have to answer any questions you don't want to answer.

**PAYMENT/COMPENSATION FOR PARTICIPATION**

You will not be compensated for your participation; however, if you are interested, the researcher will share with you the results of the study once completed.

**CONFIDENTIALITY**

The data will be stored on a password protected computer until after the study has been completed and the researcher has graduated, at which point the data will be destroyed. Additionally, your responses will be aggregated with other participant responses and your name will not be attached to any quotations used in the final report. In general, your responses will be made anonymous through pseudonyms and removing identifiable characteristics.

The members of the research team and the University of Southern California's Human Subjects Protection Program (HSPP) may access the data. The HSPP reviews and monitors research studies to protect the rights and welfare of research subjects.

When the results of the research are published or discussed in conferences, no identifiable information will be used.

**INVESTIGATOR CONTACT INFORMATION**

Principal Researcher, Allison Fry via email at [allisocf@usc.edu](mailto:allisocf@usc.edu) or phone at (713)882-1122  
Faculty Advisor, Tracy Tambascia via email at [tpoon@rossier.usc.edu](mailto:tpoon@rossier.usc.edu) or phone at (213) 740-9747

**IRB CONTACT INFORMATION**

University of Southern California Institutional Review Board, 1640 Marengo Street, Suite 700,  
Los Angeles, CA 90033-9269. Phone (323) 442-0114 or email [irb@usc.edu](mailto:irb@usc.edu).