



Mentoring as a leveraged strategy to close the network gap in the life sciences industry

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Mentoring as a leveraged strategy to close the network gap in the life sciences industry

Doctor of Education Leadership (Ed.L.D.)

Capstone

Submitted by

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To the Harvard Graduate School of Education

in partial fulfillment of the graduation requirements for the degree of

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Dedication

I dedicate this Capstone to my parents, Chen Hu and Ling Qing Jin.

For my mom, whose strength and sacrifices have taught me perseverance and humility.

For my dad, whose lifelong pursuit of learning continues to inspire me.

Acknowledgments

Life Science Cares team: Thank you for this incredible year of growth, impact, and friendship. Sarah MacDonald, Lila Neel, Dr. Kelly Brawn, Bailey Katsumata-Smith, and Michelle LaVine, thank you for your guidance and emotional support throughout this journey. You are each a remarkable force. You set high bars as leaders and as an organization. I have learned more than I can express from each of you. Rob Perez and the Board of Directors, thank you for taking me in as a resident and allowing me to be part of the amazing story of Life Science Cares. Finally, to those I met along the way, your insights and willingness to collaborate made our work possible.

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I. Abstract

Access to social capital has an immense impact on socio-economic mobility and career attainment. All too often, students from underserved and marginalized communities struggle to find and mobilize social capital. This inequitable access to professional career networks is known as the network gap. Students in affluent communities are tapped into networks with enormous social capital. For others, unless there is an external intervention, access to those networks is limited. My Ed.L.D. residency focused on addressing the network gap. One promising solution is corporate volunteer mentorship. While many of these models exist across the landscape, few look at mentorship through a social capital construct. Even rarer are cases of corporations linking youth mentoring activities to closing the network gap. My residency site was Life Science Cares, a corporate social responsibility nonprofit that leverages the intellectual, financial, and human capital of the life sciences industry to tackle poverty. The life sciences industry is one of the fastest growing and most economically powerful mission-driven sectors in the world. Through Life Science Cares, I launched a program called One-to-One that connects life science industry volunteers with underserved college students for one-on-one networking and career exploration. Ultimately, my work uncovered a low-lift, high-impact model that enables the life sciences industry to work towards purposefully closing the network gap. This model's feasibility relies on a combination of both low-code and custom technology to drive student and volunteer engagement. My findings also serve as a proof-of-concept for other industry sectors to build upon as they deepen their commitment and impact in the fields of education and workforce development.

II. Introduction

“The social capital metaphor is that the people who do better are somehow better connected. Certain people or certain groups are connected to certain others, trusting certain others, obligated to support certain others, dependent on exchange with certain others. Holding a certain position in the structure of these exchanges can be an asset in its own right. That asset is social capital, in essence, a concept of location effects in differentiated markets” (Burt, 2000, p. 347).

Personal and professional networks carry value, otherwise known as social capital. Social capital and how it gets used can have an immense impact on economic mobility. Students in affluent communities are tapped into networks that share enormous social capital. These networks include family, community members, and professional connections who provide a variety of strategic help as a student progresses through school and considers college or career. Students in less affluent communities have less access to these existing networks and the help they provide (e.g., access to prestigious internships, informational interviews, unadvertised job opportunities). In the context of my residency, I define the network gap as the lack of equitable access to professional career networks among students from underserved communities. This network gap results in fewer opportunities for students from disadvantaged backgrounds especially as they prepare for industries where social capital is often the primary access point.

My strategic project during my residency focused on building a new program called One-to-One that can help underserved college students gain access to and benefit from such networks. My residency site was Life Science Cares, a nonprofit that advances the corporate social responsibility (CSR) interests of the life sciences industry. The Life Science Cares’ mission is to leverage the intellectual, financial, and human capital of the life sciences industry to tackle poverty. Life Science Cares currently operates in four

locations: Boston, Philadelphia, San Diego, and the San Francisco Bay Area. I worked in the Boston affiliate.

Education is widely recognized as a primary engine for economic mobility. Through knowledge and skills-building, education can help people land better jobs and increase their wealth (OECD, 2019). Beyond the amount or type of education, prior literature has also shown that social capital exerts a huge influence on career development outcomes (Granovetter, 1995). Many lucrative jobs are found through connections which marginalized groups typically have less of due to structural barriers, regardless of their level of education (Smith, 2005; Parks-Yancy, 2010). Additionally, how an individual perceives and pursues education is influenced by what information and power is embedded in their network (Lareau, 2002). Altogether, this suggests that one's social capital can hold an outsized influence over one's career success.

Historically, the education sector has focused on knowledge attainment often at the expense of purposefully building students' social capital (Charania & Fisher, 2020). As Fisher (2015) presents it, "social capital is the invisible currency of education reform" (para. 1). In other words, who you know matters just as importantly as what you know. Today's job market signals this view. According to one survey, 85% of new jobs are filled via networking (Adler, 2016). Looking more broadly, many jobs are not publicly listed (Parks Yancy, 2010). Employers rely on employee referrals, general networking, and search firms, creating what is known as the hidden job market (Cornell, 2020). If students are not effectively cultivating professional connections, they may already be at a severe disadvantage before they enter the workforce.

The One-to-One program emerged from the need to explore innovative solutions that expand students' social capital. Life Science Cares founder Rob Perez conceived the idea behind One-to-One after realizing how much career support he was giving to the children of his friends and colleagues. The

vision was that the life sciences industry could do the same but focus on students who traditionally lacked access to professional networks. If successful, One-to-One would not only address a massive equity issue referred to as the network gap but also offer an opportunity for passionate volunteers to give back. The hope was that by providing students with easy access to industry professionals and arranging a structure for having one-on-one meetings, students would be able to bridge gaps in their network.

The network gap issue intersects with other pressing needs in the life sciences ecosystem. Both my residency focus and Life Science Cares are situated in this context. The heightened attention to implicit bias, diversity, and inclusion combined with a talent shortage in the life sciences sector have pressured industry leaders to consider what meaningful engagement looks like on those fronts. These conversations motivate Life Science Cares to pursue moonshot ideas and quickly test innovative solutions like One-to-One. My strategic project involved building a scalable model of One-to-One. In One-to-One, underserved college students recruited from partner organizations and institutions can arrange meetings with volunteers from Life Science Cares' corporate partners (individual firms) for on-demand networking and career exploration. Considering the capacity of my residency site and the life sciences ecosystem saturated with start-ups, my key objective was also to ensure future sustainability of One-to-One. Ultimately, I was able to build a scalable and sustainable model of One-to-One which resulted in the Board's commitment to continue expanding this program. As I delve deeper into this Capstone, I share how my project unfolded and considerations for this program's growth.

The following sections detail my analysis and outcomes of my strategic project. As an outline, in Section III, I review 1) key industry trends and mentoring as a promising solution, 2) my organizational context, and 3) literature on change and risk management. This literature review leads to my theory of action summarized in the following: if I explore how to build One-to-One in manner that shows promise for scale, then I can secure the capacity for Life Science Cares to scale this program leading to long-term beneficial outcomes for students, Life Science Cares, and other ecosystem stakeholders. In Section IV, I

describe my strategic project in greater detail. Here I include an overview of my approach, a summary of key evidence, and my analysis of factors that influenced my progress. In Sections V, VI, and VII, I discuss the implications of my project on my leadership, my organization, and the sector.

III. Review of Knowledge for Action

The Field

My strategic project is about solving the network gap. LinkedIn describes the “Network Gap” as the “advantage some individuals have over others as a result of who they know” (LinkedIn, n.d., para. 1). Extending this reality to my strategic project, the network gap acknowledges that students from underserved communities entering the workforce have enormous potential to succeed but are often shut out because they lack the connections.

The COVID-19 pandemic has magnified the harsh reality of the network gap. Learning disruptions and summer internships upended by the pandemic have made it challenging for college students to find mentors and sponsors (Hora et al., 2021; Hamdan, 2021). While experienced workers can rely on weaker ties in the job search process, young professionals rely on their closest connections, particularly their parental networks (Kramarz & Skans, 2014). Families in low-income settings lack the social capital to achieve economic mobility and therefore, are not able to provide students with the help they seek (Lareau, 2002). Meanwhile, top talent embedded in thick social networks are using their connections to pivot into better roles or industries in a movement known as the “Great Resignation” (Gallo, 2021). This reliance on networking benefits the affluent. A LinkedIn user in a zip code with a median income over \$100,000 is nearly 3x more likely to have a stronger network than a member in a low income zip code (Garlinghouse, 2019).

The resurgence of diversity, equity, and inclusion initiatives (DE&I) has compelled the private sector to take a renewed focus in supporting underserved students of color (Markowitz & Sault, 2020). In the days following George Floyd's death, biopharma CEOs were among the first business leaders to voice their sentiments (Sagonowsky et al., 2020; Bulik, 2022). In the aftermath, over 130 life science CEOs in Massachusetts signed public pledges to address systemic racism (MassBio, n.d.). As this industry's vehicle for corporate social responsibility, my organization shares some of the interests and aspirations reflected in these commitments. To situate my strategic project in this broader landscape, I summarize three trends that are driving the life sciences sector to prioritize and act on the network gap issue.

Trend 1. The life sciences industry has made public commitments to diversify its talent and workforce. According to a study conducted by the Biotechnology Innovation Organization—the world's largest biotech trade association—nearly 7 in 10 sampled firms listed DE&I in their value statements in 2020, up 24% from 2019 (Biotechnology Innovation Organization & Coqual, 2021). A common theme that emerged was the aggressive focus on diversifying its workforce. In a 2021 survey of nearly 200 life science executives in the U.S., 65% of respondents said the DE&I efforts have become a strategic priority at their firms (TEConomy Partners, 2021). These efforts varied. Some focus on immediate diversity hiring and unconscious bias training. Other efforts are community-facing and overlap with CSR initiatives. These programs include engaging underrepresented minorities through STEM education and general career awareness. Although the network gap is not explicitly referenced, the notion of spreading social capital is present throughout. For example, expanding networking opportunities for BIPOC leaders and building relationships with communities to improve diversity sourcing are mentioned in the Massachusetts life sciences CEO pledge (MassBio, n.d.).

Trend 2. The life sciences industry is recognizing the need for structural change in their hiring practices. In recent years, scholars have begun to push back on the skills-gap hypothesis which states that workers cannot find jobs because they lack the hard and soft skills. Recruiting based on

meritocracy underplays the effects of structural factors such as the structure of the labor market, implicit bias during hiring, and the inequitable access to social networks (Modestino et al., 2020; Granovetter, 1973; Castilla et al., 2013; Trimble & Kmec, 2011). Firms are adopting this structural view as they explore new diverse talent and seek to make their presence visible in those communities. In 2020, the current chairman of Merck, Ken Frazier, co-founded OneTen to tackle these structural barriers. OneTen is a coalition of dozens of corporate CEOs who have pledged to hire and promote one million Black professionals without four-year college degrees (OneTen, 2021). Two of the five executive committee members come from the life sciences industry. This industry's willingness to think differently about their recruiting systems puts a spotlight on the network gap issue. In 2018, key life sciences stakeholders came together and explicitly identified the lack of connections as the primary barrier to a student's first internship opportunity—not a lack of skills. These conversations resulted in the creation of Project Onramp, a collective impact initiative spearheaded by Life Science Cares to identify and place students from diverse low-income backgrounds into life science internships.

Trend 3. Hiring gaps and employee turnover are motivating the life sciences industry to tap new talent pools. In a recent BioSpace community survey, 67% of life science professionals are looking for a new job within 12 months (Terry, 2021). Competition for local talent increases the amount of poaching from neighboring firms. Boston biotech firms are “feeling compelled to move fast, pay more, and inflate titles” (anonymous, personal communication, February 3, 2022). Poaching presents real costs to firms but they also signal that new talent is not entering the market. In the life sciences industry, “supply is not keeping up with demand” (MassBioEd, 2021, slide 39). By 2024, the industry is estimated to add an additional 40,000 new jobs (MassBio, 2021). However, the most difficult positions to hire for—regulatory affairs, data science, engineering—are secondary talent in which the competition is fierce with other industries (MassBioEd, 2021). Specialized biomanufacturing roles such as medical and lab technicians represent almost a third of the industry's jobs (TEconomy Partners, 2021). These positions do not require four-year college degrees but those workers are also recruited heavily across the middle skills

job market. This has prompted the industry to take targeted action. In the Massachusetts life sciences industry, between 2010-2019, there has been a 154% increase in hires with associate degrees (MassBioEd, 2021). Launched in 2021, MassBioEd's life sciences apprenticeship program does not require a college degree from participants and explicitly encourages jobseekers of color and women to apply (MassBioEd, n.d.). The Massachusetts Life Sciences Center, a quasi-public agency of the Commonwealth of Massachusetts, is in the early stage of forming a coalition that connects biotech hubs across New England. The coalition aims to build a workforce to fill the talent gap for biomanufacturing and scale-up emerging technologies in biopharmaceutical manufacturing. In the concept proposal, community college students and women entrepreneurs of color are explicitly named as the target talent pool (anonymous, personal communication, February 4, 2022).

These trends suggest consensus in the life sciences industry that new connections need to be forged between firms and the communities where new diverse talent exists. This means proactively addressing the network gap. One promising solution to the network gap is mentorship. A mentorship is a connection and in a career context, can offer the social capital that students or jobseekers need to participate and thrive in the workforce. One relevant research stream, beginning with Kram (1988) and expanded further by Higgins and Kram (2001), looks at mentorship as a network of “developers” (e.g., mentors, sponsors, peers etc). These “developers” can individually or jointly support the protégé or in this case, the student. This way of conceptualizing mentorships is different from the traditional perspective of a student relying on a single primary mentor. Higgins and Kram (2001) refers to the new model as a “developmental network” in which value is derived from having multiple “developers” at once. In a career context, this means the attributes of a student's personal network can influence their ability to access and activate mentoring relationships. For example, a diverse network across school, family, and employers can unlock new information and access to resources (e.g., an employee who recommends a student to an internship at their company). Looking at mentorship from a developmental network perspective puts the spotlight on bridging ties. Bridging ties are relationships that can allow individuals to

access resources not otherwise available (Putnam, 2000). Such relationships allow the power of social capital to flow between groups with different demographic or social differences.

As part of an emerging trend, the private sector is starting to recognize the inequitable distribution of social capital. To address this gap, firms are making early strides in the form of mentoring to purposefully spread and measure social capital. Salesforce and LinkedIn fund a variety of mentorship-focused nonprofits as part of their explicit mission to close the network gap (Salesforce, n.d.; LinkedIn, n.d.). Capital One reports the extent to which schools perceive increases in students' professional network through one of its corporate mentoring initiatives (Capital One, 2021). These efforts are suggestive evidence of the private sector at-large beginning to link mentoring concepts to the network gap issue.

Looking beyond corporations, the nonprofit mentoring space provides the bulk of mentoring services to students; however, this space is facing serious headwinds (Garringer, 2017). Traditional mentorship programs are costly to implement and present an incomplete solution to the network gap. Garringer's study (2017) revealed that most mentorship programs in the U.S. are small budget operations, not resourced for scaling. Most nonprofit mentorship programs focus on a single relationship without considering mentoring in the context of developmental networks as explored in the literature. This narrow focus does not offer a platform for continuously expanding a student's network to access new information and resources. Consequently, the type of help remains limited for students from disadvantaged backgrounds.

Given the combination of financial resources, capacity (including more potential mentors), and its business interests in workforce development, the private sector is uniquely positioned to provide youth mentorship at scale (Bruce & Bridgeland, 2014). A 2015 cross-sector study found that in return for their investments in corporate youth mentoring, firms saw increased employee productivity, improved morale

and retention of employees, and improved public image and community relations (Ernst & Young, 2015). Additionally, as volunteerism becomes a core component of CSR efforts, more employees are raising urgency in their firms to ensure that volunteer opportunities are prevalent and accessible. One important insight from the TEconomy report (2021) was that executives emphasized “bite-sized” engagements in STEM education such as speed mentoring. Speed mentoring is easy for employees to participate and allows for more interactions between employees and students.

Situating mentoring within a developmental network construct puts more attention on the network gap and possible entry points for firms to engage this issue. Reflecting on the relevance of the network gap from both the business value and student outcomes perspective, I viewed my strategic project as an iterative process to uncover a potential new model of corporate youth mentorship. In order to help Life Science Cares and the life sciences industry benefit from this model, I would have to launch and ensure feasibility of One-to-One as the beta test.

The Organization

In this section, I highlight Moore’s concept of public value (1995) to preview how my organization defines and creates public value as a CSR entity that has cross-sector constituents. This framework states that a successful strategy has to be “publicly valuable”, “operationally feasible”, and “socially legitimate” (Leonard & Moore, 2012, p. 84). Public value is a vision that describes how “an individual and collective quality of life will be improved by a particular course of action” (Leonard & Moore, 2012, p. 98). Operational feasibility refers to whether the organization has the assets and know-how to deploy those assets in order to execute the work. Social legitimacy represents the political support or authority needed to give credibility to the organization delivering the strategy. I will return to this framework in my post-mortem analysis of the factors that influenced progress on my strategic project. In the context of my organization, public value is generated on two fronts: helping nonprofits tackle poverty and producing CSR benefits to the industry. Life Science Cares’ trust-based philanthropy model

is straightforward; the organization offers unrestricted funding to nonprofits via an application and review process. For our corporate partners, the public value that we generate is more complex. Rangan et al., (2015) offers a strategy development lens to interpret how firms like Life Science Cares can maximize the value of their CSR efforts. This lens is rooted in a portfolio-based view of CSR that emphasizes coordination across three theaters of value creation: 1) philanthropy 2) short-term operational improvements and 3) long term business model transformation (See Figure 1).

FIGURE 1.
PORTFOLIO-BASED VIEW OF CSR

This graphic illustrates a multifaceted approach to CSR (Rangan et. al., 2015). In this approach, CSR activities can fall across 3 theatres: 1) philanthropy 2) short-term operational improvements and 3) long-term business model transformation. Generic examples are provided to help describe what each activities in each theater could look like.

Theater 1 Philanthropy	Theater 2 Operational Improvements	Theater 3 Business Model Transformation
These impacts do not directly contribute to bottom line profits but have other important impacts.	These impacts may increase revenue or reduce costs but mostly support different value chain functions.	These impacts tend to create new business or significantly alter the status quo of the current business model.
GENERIC EXAMPLES		
• Money or equipment donations • Engagement with community initiatives • Employee volunteering	• Sustainability initiatives that reduce waste or emissions • Investments in employee working conditions, healthcare, or education • Activities that increase firm reputation or brand	• An initiative or new business model that generates social and business gains that can be tied to improved financial performance in the short term

This view is a nuanced departure from the idea of “shared value” which has been widely cited in CSR literature—shared value states that creating social value should also create economic value (Porter & Kramer, 2006; Bonini et al., 2009; Keys et al., 2009). Rangan et al. points out that philanthropic activities do not have to be tied to business objectives. Life Science Cares adopts this multifaceted CSR approach. While some strategic efforts create economic value by design, other features including Life Science Cares’ orientation towards trust-based philanthropy is more compatible with a traditional view of CSR than creating shared value (CSV). In an ideal state, all three theaters should align to organizational values and move in a coordinated way (Rangan et al., 2015). This notion of cross-theater coordination underpins my analysis later on regarding how my team perceived the value of my work.

The Work

Life Science Cares operates like a platform business. A platform business is an ecosystem builder that relies on creating opportunities of interaction between members of that ecosystem (Van Allstyne et al., 2016). Life Science Cares does this by bringing firms, industry leaders, employees, and nonprofits together. My project also adopts a platform strategy through delivering programming and technology that brings students and volunteers together. Despite their huge upside potential, most platform strategies fail due to weak value propositions or failing to build trust with users and partners (Yoffie et al., 2019). Beyond anticipating these risks for my project, I knew that leading through them would be a major learning throughout my residency. Eager to ground my approach in product management discipline, scaling innovation, and risk management tactics, I started reviewing the following resources: 1) Harvard Business Review's "10 Must Reads" series on Platforms and Ecosystems published in 2020; 2) *Doing Agile Right: Transformation without Chaos* by Darrell Rigby, Sarah Elk, and Steve Berez; 3) Robert Sutton's *Eight Essentials for Scaling Up Without Screwing Up*; 4) Robert Sutton and Huggy Rao's *Scaling Up Excellence*; and 5) John Kotter's *Eight Steps for Leading Change*. Below, I surface four major takeaways that emerged from my review.

1. Define the “it” to be scaled in a platform business. Deciding what to scale and in what sequence is a complex question for platform-based businesses. At times, bottlenecks in the ecosystems have to be addressed before even introducing an innovation (Adner & Kapoor, 2016). In other instances, securing a small technical advantage can bring about massive adoption (Zhu & Iansiti, 2019). The literature on platform design rests on a shared property of successful platform businesses: success depends on a firm's ability to manage network effects. Van Alstyne et al. (2016) define network effects as demand-side economies of scale: the larger the network, the better the matches between supply and demand. Defining what to scale starts with anticipating how different user groups will interact, reducing friction in their ability to interact, and having the key partnerships in place (HagiU & Altman, 2017).

2. Use agile to combat uncertainty and risk. Change leaders know that having a vision is critical to driving alignment and commitment (Kotter, 1995). However, the roadmap to the vision seldom stays the same from the start of a change project to its finish. Responding to ongoing volatility in the post-pandemic era requires an agile approach to change work itself. In this new reality, an agile mindset and method is about creating value for the end-user as opposed to sticking to a fixed plan (Rigby et al., 2020). An agile mindset values learning, experimentation, and short feedback loops which can naturally reduce uncertainty and risk (Rigby et al., 2020). Operationalizing agile starts with the agile team, which is “the heart of an agile enterprise” (Rigby et al., 2020, p. 35). Specific techniques and protocols guide the way agile teams work. Kanban is one such technique used to visualize and manage work during a project. The power of Kanban is in its ability to provide just-in-time delivery (Rigby et al., 2016).

3. Provide cool solutions to hot causes. Making a rational argument often is not enough to change human behavior. “The most effective campaigns stir up hot emotions in people (pride and anger are especially effective) and then channel that energy and passion into cool (clear and step-wise) actions” (Sutton, 2014, para. 6). Hot causes and cool solutions remind change agents to pay attention to cognitive load. Cool solutions should be simple to understand. Complicated solutions can increase cognitive load, causing people to lose focus or become overwhelmed. Sutton (2014) goes on to say that scaling up can be a problem of less. Limiting what people are expected to focus on can reduce cognitive load which accelerates execution. Cool solutions also play into linking short-term realities to solving big issues at scale. People do not think enough about immediate steps to achieve long-term goals or underestimate the complexity of such goals (Sutton & Rao, 2014). This lack of short-term clarity can create “unrealistic fantasies” when it comes to doing the actual scaling work (Sutton & Rao, 2014, pg. 17).

4. Find short-term wins to sustain commitment. Kotter (1995) suggests that creating short-term wins builds credibility, informs strategy, and boosts morale. In an agile context, short-term wins can highlight successful experiments for future iterations. Whether that win was intended or not, key learnings

may go unnoticed without celebration. Since agile emphasizes continuous improvement, a quick win is also the outcome of a sprint or a new feature release. In the nonprofit space where there is often an underinvestment in strategic tech talent, achieving quick wins during any technology implementation can help ease anxieties.

As I reflected on the context of Life Science Cares and the goals of my strategic project, I felt an agile iterative approach would deliver the greatest value to the organization. Agile requires more than the technical expertise of scoping, developing, and deploying products. It requires leadership competencies to balance multiple objectives in a project, motivate key people, and sustain their commitment over time. Guided by an agile approach, I developed a theory of action which incorporates the four aforementioned takeaways from the literature. My theory of action guides my actions (if inputs), expectations (then outputs), and long-term outcomes associated with my strategic project. I will return to this theory of action when I provide evidence and analysis of my work in later sections.

Theory of Action

If I explore how to build One-to-One in a manner that shows promise for scale by:

- 1) Defining One-to-One's model and value proposition informed by earlier pilots;
- 2) Adopting an agile approach to program development and execution;
- 3) Establishing clarity for senior internal stakeholders in One-to-One's scaling roadmap; and
- 4) Providing evidence of impact and technical successes early and along the way;

Then I can secure the capacity for Life Science Cares to scale One-to-One evidenced by:

- 1) The organization's commitment to sustain the program's growth;
- 2) Greater internal recognition that the organization should play a more expansive role in education and workforce development; and
- 3) New resources and partnerships that Life Science Cares can rely on to scale its collective impact agenda nationally.

So that these lasting impacts can be achieved:

- 1) More students from underserved communities can achieve long-term career success through professional networking;
- 2) The life sciences industry has a diverse workforce talent pipeline; and
- 3) Life Science Cares can be a thought leader and a model for other industries to effectively engage in corporate responsibility work.

IV. Description, Evidence, and Analysis of the Strategic Project

Overview of Strategic Project

In the fall of 2020, Life Science Cares Boston conducted two pilots of a program that came to be known as One-to-One. These pilots matched a few dozen underserved college students with life science professionals for a one-time virtual networking call. Although these pilots received overwhelming positive feedback and helped prove several programmatic elements, internal stakeholders did not find the solution sustainable. Figure 2 shows the primary challenges and risks revealed in the 2020 pilots.

The goal of my strategic project was twofold: 1) improve the feasibility of the One-to-One program and 2) contribute knowledge on how best to scale the program for our Boston affiliate and nationally across the other affiliates. I viewed my project as the follow up to the 2020 pilots but still in the same early stage of determining a model that works for students, volunteers, and Life Science Cares. My deliverables were intended to lay the foundation for a future program manager to do the actual scaling work.

FIGURE 2.
FINDINGS FROM 2020 ONE-TO-ONE PILOTS

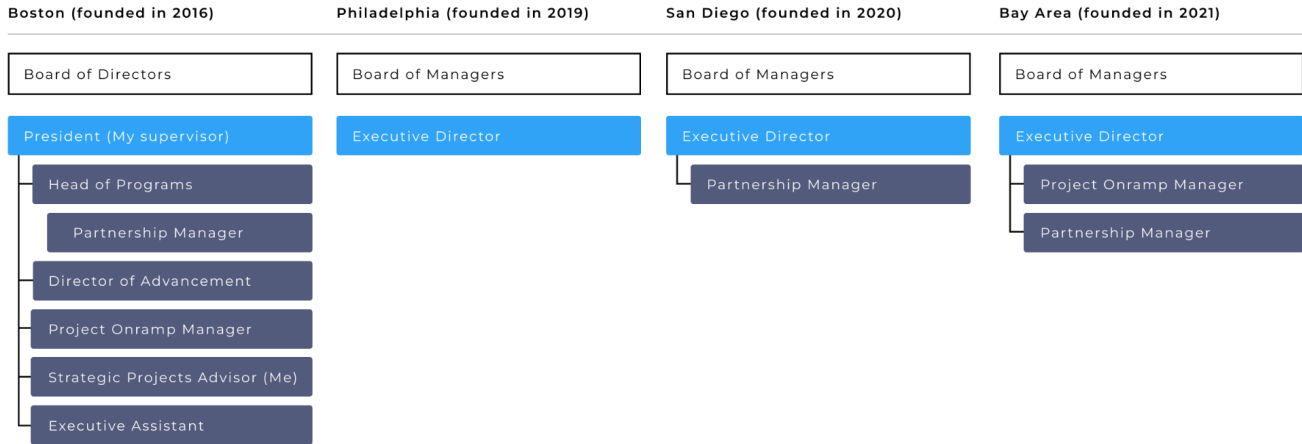
This table illustrates the challenges and risks that were revealed from One-to-One's initial pilot in 2020. This table includes our priorities expressed by my supervisor and our Board. The far-right column lists unresolved questions that the leadership team had regarding One-to-One moving forward. The highest priorities were to improve feasibility of the program and determine a sustainable operating model.

Key capabilities	Challenges/risks revealed in the 2020 pilots	Priority from leadership	Unresolved questions
Student Reach	The students were recruited from education nonprofits and 1 small private college. It was uncertain if/how the program could recruit from 4-yr public schools to expand reach in the future.	Medium	What is the playbook for student recruitment that can increase student participation and help secure commitment from diverse partners?
Volunteer Reach	Mobilizing volunteers was a strength of the organization. However, there was still uncertainty in optimizing supply and demand so that volunteers who sign up are likely to be contacted by the student.	Low	What is the short and long-term approach to volunteer recruitment that maximizes volunteer engagement?
Matching	Students were matched with volunteers after reading reading LinkedIn profiles and student essays. This was a time consuming process and not feasible with larger numbers of student and volunteer participants.	High	What is the optimal low-lift, high-impact approach for organizing and curating students' access to volunteers?
Operating Model	Meetings were required to be completed within 1-2 weeks after making the match. During busy semesters, this placed pressure on students to follow through on scheduling and completing the meetings.	High	What program requirements are best suited to achieve expected outcomes and are sustainable for students, volunteers, and Life Science Cares?
Training	Instructions and support for students and volunteers were included as written documents in a one-time email attachment. This increased the risk for missed information or disengagement.	Low	What is the ideal scope and format of training to ensure meetings between a student and professional are meaningful and productive?

I worked with my supervisor, the President of Life Science Cares Boston, to define milestones and project scope. Since our team was small and the organization was still relatively new, I experienced the workplace culture similar to a start-up environment. Our roles tended to be cross-functional and work was fast-paced. My official title was the Strategic Projects Advisor (See Figure 3). We had a flat hierarchy with seven team members at the Boston affiliate. This structure allowed all ideas to be explored and decisions to be made quickly. Outside of electronic communications, discussions occurred during 1:1 calls, small group meetings, or all-team check-ins which occurred twice weekly. At the same time, my supervisor delegated high-level responsibilities to promote greater accountability among individual team members. My supervisor drove the vision of our projects and guided team members to align their strategy with the vision and budget. My supervisor had the authority to approve resources for One-to-One and ultimately was accountable for the program's success to the Board of Directors.

FIGURE 3.
ORGANIZATIONAL STRUCTURE

This organizational chart illustrates the staffing at each Life Science Cares affiliate as of March 2022. The Board of Directors is the legal governing body for all the affiliates. The President of Life Science Cares Boston (my supervisor) reports to the Board of Directors. The non-Boston affiliates are governed by a Board of Managers which includes a representative from the Board of Directors.



My role was similar to a program manager, serving to define and execute a roadmap to achieve One-to-One's feasibility and gather learnings. To that end, my work was highly tactical on a day-to-day basis. Figure 4 illustrates five on-the-ground key activities that I engaged in. Each of these activities is aligned to multiple inputs within my theory of action.

FIGURE 4.
ALIGNING THEORY OF ACTION INPUTS TO KEY ACTIVITIES

This table illustrates how each key activity aligns to different inputs within my theory of action. Through conducting these activities, I sought to achieve the specific components of my theory of action. See Figure 7 for evidence of this work.

		THEORY OF ACTION INPUTS			
		Define the One-to-One Model	Adopt an Agile Approach	Establish Roadmap for Scaling	Show Success Early and Often
KEY ACTIVITIES	Application Lifecycle Management	✓	✓	✓	✓
	Mobilizing Partnerships	✓		✓	✓
	One-to-One Program Management		✓	✓	✓
	Data Analysis and Communication	✓		✓	✓
	Consulting on Adjacent Programs	✓		✓	

Key activity 1: Application Lifecycle Management. A key feature of One-to-One is recommending industry volunteers for students to contact. This recommendation system acted as a filtering mechanism to allow students to quickly get the help they need —career guidance, interview prep, soft skills development etc. The major bottleneck during the 2020 pilots was the enormous time it took to create personalized matches. The work was performed manually by reviewing student application essays and LinkedIn profiles. This process took about an hour for each student and would increase non-linearly as more volunteers signed up. I aimed to reduce this lead time by creating a weighted tag-based recommendation algorithm. Here I used an agile approach to validate the matching logic through user interviews and then shift into coding in R. I also built a user-facing app to track meeting activity and made continuous delivery updates throughout the year. It was important that these tools were simple and customizable to reduce the learning curve for future staff. I also hoped that any positive results from stress testing these tools early on would increase my team’s confidence in the scalability of One-to-One.

Key activity 2: Mobilizing Partnerships. On the industry side, Life Science Cares has the expertise, reputation, and connections to mobilize its corporate partners to participate in One-to-One. On the student side, the organization relies on student support partners—nonprofits and higher education institutions—that advertise and recruit their students into One-to-One. Mobilizing these partnerships was important for reasons beyond just recruitment. First, getting feedback from student support partners on our value proposition and technology could validate our approach. Second, I wanted to anticipate any downstream implications of One-to-One’s recruitment strategy on the actual student experience. For example, the students who participate in this program influence the makeup and volume of the volunteers we recruit. Third, I saw these early conversations with partners as an opportunity to set expectations to focus on learning, not just the outcomes.

Key activity 3: Program Management. I led all activities related to One-to-One’s launch and implementation. While my team was a sounding board for feedback, I was responsible for the logistics

and tactical decisions of this program. Working deeply on One-to-One supported multiple inputs of my theory of action. First, I was well-positioned to identify and communicate early successes. Second, I applied my expertise in agile software development to program management. This meant having a phased delivery approach throughout the year and prioritizing a minimal scope in each phase that could still lead to a positive impact. Third, in having detailed visibility of the workload, I could forecast processes where additional human support is needed if the program were to expand.

Key activity 4: Data Analysis and Communication. The collection and use of data was critical from a learning and institutional knowledge standpoint. My data was mostly sourced from interviews, surveys, platform analytics, and stakeholder meetings. Besides analyzing the frequency and impact of student and volunteer meetings, I also used real-time data to guide scope changes in the technology and the program. I shared this analysis with internal and external stakeholders to varying levels of detail at different cadences. These update meetings were meant to communicate progress and build momentum. I also felt it was important to engage the team in strategic decision-making. After collecting and analyzing data, I turned to conveying relevant insights and persuading senior team members to consider a point of view or make a tactical adjustment. I hoped these evidence-informed conversations could highlight small wins in the process and help reduce uncertainties as new recommendations were formed. Over the stretch, I hoped that these dialogues would increase my team's interest in sustaining the program post-residency.

Key activity 5: Consulting on Adjacent Programs. My final activity was consulting on adjacent education-related projects that have a direct impact on One-to-One. I supported strategic planning, collateral development, and implementation for two primary efforts. The first was Project Onramp, the organization's signature program that placed underserved college students in life science internships. Project Onramp provided a student pool for One-to-One recruitment. Therefore, integrating One-to-One into Project Onramp's services made strategic sense. The second effort was planning a joint initiative called Compass Collaborative with MassBioEd. MassBioEd is an education foundation focused

on addressing workforce needs in the Massachusetts life sciences industry. This effort was the first of several steps for my organization to shift the decentralized STEM volunteering landscape towards a more streamlined and effective model. Through Compass Collaborative, MassBioEd would provide mentorship training relevant to our One-to-One volunteers.

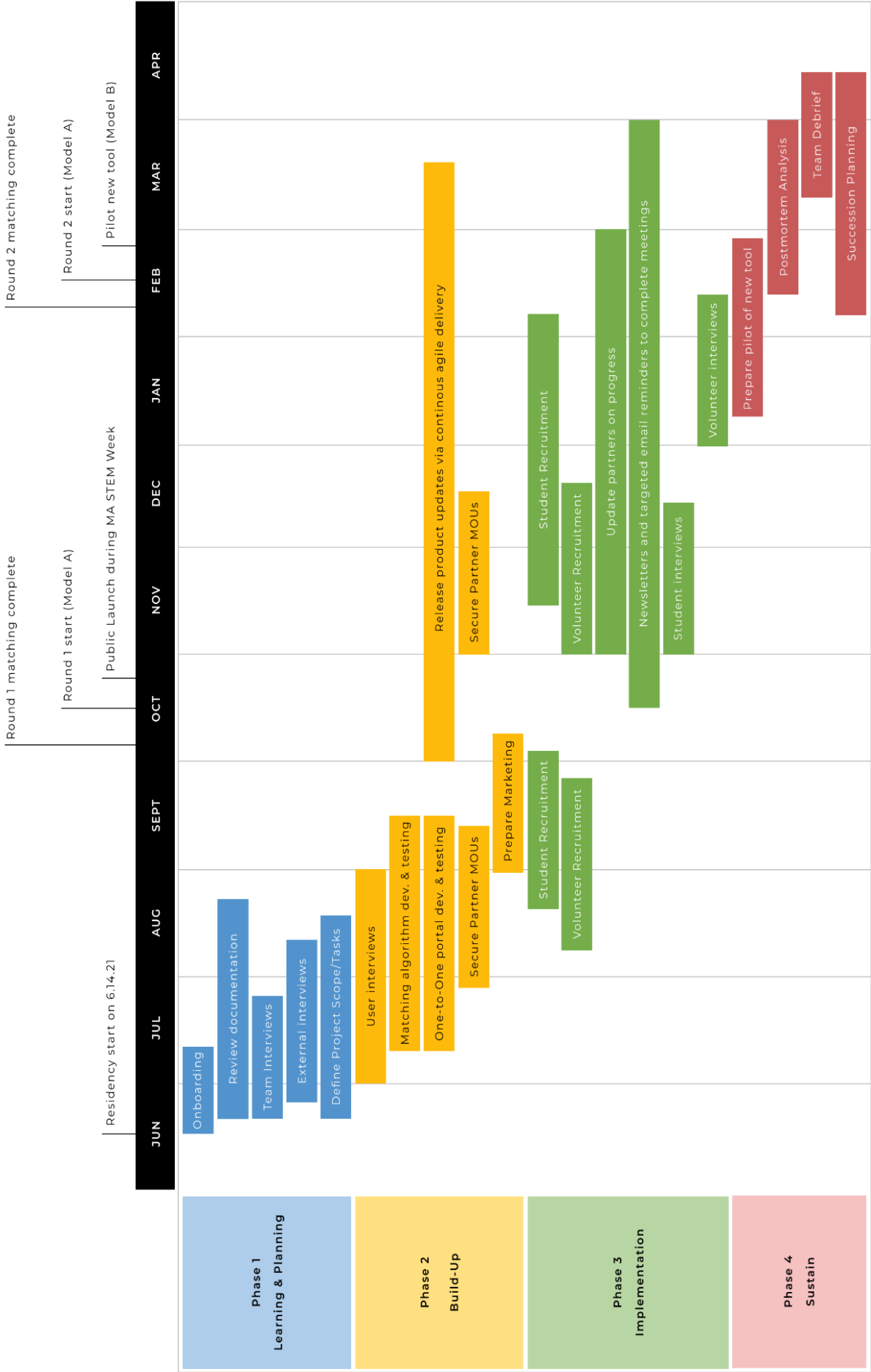
What Happened

My five activities occurred over four phases (See Figure 5). In the “Learning & Planning” phase, I focused on learning about the organization, defining the scope and objectives of my strategic project, and finding out what resources would be available. In the “Build-Out” phase, I began to develop a strategy for implementation, build out the tooling and infrastructure, and bring key decision-makers to the table. In the “Implementation” phase, I focused on recruiting students and volunteers, launching One-to-One, troubleshooting, and evaluating progress. In the “Sustain” phase, we piloted a new tool in hopes of making the process of scheduling meetings more convenient.

Phase 1: Learning & Planning (June - July). In my first month of my residency, I focused on learning organizational-level goals and asking different team members how they saw addressing the network gap contributed to the overall mission of the organization. This process began with learning about the organization's history in meetings and reading CSR literature. I also learned about organizational assets and gaps from individual team members. This helped me identify potential opportunities and constraints with launching a new program. Meetings with my supervisor at this stage helped me understand the motivation and expectations from the Board of Directors. For example, I learned that the Board was generally aware of the findings from the 2020 pilots. The Board was left with questions around scaling One-to-One in its current form which required a lot of manual labor. From these meetings, I created an initial project charter that included goals in the form of Objectives and Key Results (OKRs).

FIGURE 5.
TIMELINE OF TASKS ACROSS 4 PHASES

This timeline shows the major tasks I completed across four phases of my work: 1) Learning & Planning 2) Build-Up 3) Implementation and 4) Sustain. In the fall, One-to-One required students to initiate email outreach to any volunteer they picked. This model is referred to as Model A. In the Spring, we piloted a different approach in which students received calendar invites to assigned volunteer matches. This second model is known as Model B. See Appendix O for a comparison of Model A and Model B.



Early in this phase, I began interacting with stakeholders outside of Life Science Cares. I met with the previous manager of the One-to-One 2020 pilots who had since left the organization. I wanted to learn what worked and what could be improved. For example, I learned that technology constraints had to be overcome to ensure that the program is feasible to support even a slightly larger volume of students and volunteers. This knowledge helped me prepare a timeline to accommodate initial research of platforms that could address bottlenecks. In July, I presented my supervisor with several approaches that could assist with matching students with volunteers and tracking meeting activity. After several demos with third-party vendors and doing some technical scoping, I was able to share the opportunities and risks associated with each option. This analysis allowed my supervisor and I to make an early decision on which option to pursue. While this was happening, I gauged demand for the program from external stakeholders. I started conducting informational interviews with students, volunteers, student support partners, and corporate partner contacts who were in CSR, HR, and managerial roles. These conversations helped me understand their interests and anticipate potential constraints. In my first four months of residency, I also attended several strategic planning calls for Project Onramp. The audience was a select group of corporate and nonprofit partners. I saw this as an early opportunity to learn stakeholders' viewpoints on key issues areas related to education and career access.

Phase 2: Build-out (August - early September). In this phase, I focused on completing time-sensitive deliverables to prepare for One-to-One's launch. This phase marked my transition from planning to execution. There were two major work streams during this phase: securing commitments from participating partners and building out the technology to run One-to-One. Regarding student recruitment, this meant drafting and signing MOUs with student support partners committing to timelines and requirements. On the corporate side, I relied on my team for introductions to corporate partners. I followed up with meetings with each company that responded and moved forward with verbal commitments. Within two weeks, I was able to gain commitments from a critical mass of firms. I began recruiting student support partners earlier in August since I wanted to leave enough time to navigate the

MOU process. My early discussions with student support partners surfaced three challenges. First, each partner had varying thoughts on the time needed to recruit students. Second, it was difficult for me to assess how realistic their projections were on student recruitment. Third, we wanted partners to troubleshoot if students became unresponsive during the program. As colleges were extremely busy preparing their students to transition to in-person instruction in the fall, I was concerned about their capacity to fully engage in the program. Since our partners viewed One-to-One as a supplemental benefit to their students, I hoped to identify a model that was both low-lift and still impactful.

My second work stream during this phase was building the One-to-One technologies. As the commitments were coming through, I began technical scoping, rapid prototyping, and developing a minimum viable product. Starting this process early in August would allow me to shift my focus towards program launch in October. The prototypes from this early technical work included a meeting tracker built on bubble.io, a backend database built in Airtable, and an algorithm in R for matching students with volunteers. This algorithm was informed by my work prior to joining Life Science Cares. I had been developing a recommendation engine for matching adult STEM mentors with high school students. I applied the same student developmental theories and matching logic to One-to-One. This logic emphasized shared experiences and values-aligned interests in addition to specific career-related factors. As the solo developer, I managed my own workflow. I used a personal Kanban board on a platform called Trello to categorize tasks into different states (e.g., backlog, in progress, and complete). From start to finish, I had about two months to research, build, and test these tools before deployment.

This phase presented several opportunities to share early wins. Although the rest of my team was not involved in creating the product roadmap, they were encouraged to see my process unfold. For example, an early win was successfully running a script in R that instantaneously matched students with professionals using dummy profile data. This test was encouraging for my supervisor since the matching work was a major bottleneck in the 2020 pilots. In August, I also delivered a sandbox account to allow

team members to test the tools. Since the development work only lasted a few weeks, I was able to share technical progress often and early in meetings with my supervisor and my team. In late August, I shared my progress in a meeting to all the Executive Directors (EDs) at the non-Boston affiliates. On the partnerships side, the major win at this stage was getting MOUs signed from our student support partners. We expected quick mobilization from our corporate partners which indeed was the case. Reaching consensus from all partners on the program model was a celebrated milestone. This model featured three rolling deadlines for program sign-up in a year. Our partners felt this would offer enough time for recruiting students. By mid-September, I secured commitments from all of our corporate and student support partners. I had completed building the necessary technologies by then so I shifted my efforts to assisting our partners with marketing and onboarding.

Phase 3: Implementation (Mid-September - January). During this phase, I focused on recruitment, program launch, progress monitoring, and continuous program iteration. This phase embedded me deeply in three of my five key activities. These were program management, data analysis and communication, and consulting on adjacent projects. These activities were intended to yield data points to show the promise of feasibility and impact of the operation. My hope was to later use these data points to build a case for my supervisor and the Board to continue expanding this program post-residency.

This phase began with our student support partners directing their students and volunteers to an intake form. In September, I started creating marketing collateral with feedback from our student support partners. Since several partners recruited students across all majors, we had to tweak the messaging to make the life sciences industry appeal to non-STEM students. Early in the MOU discussions, I attempted to document their recruiting tactics. Some relied on social media whereas others advertised in newsletters. Although I was not in a position to enforce anything, I was still able to support multiple aspects of recruitment. Beyond materials development and check-in reminders, I ensured that the intake form was intuitive and short. In the 2020 pilots, students had to submit an essay as part of the sign-up process. I

removed this requirement. I also adopted the language of “sign-up” instead of “apply”. The student support partners supported this approach; they wanted to remove any unnecessary tangible or perceived barriers for their students from underserved backgrounds to participate. On the corporate side, I shared a deck that linked to the volunteer sign-up form and instructions. My point of contact at each firm then directed their employees to the form. Some shared broadly in their team communications while others recruited individually.

Although we exceeded our recruitment goal for students and volunteers, some of the uncertainties that I anticipated with student recruitment did arise. We had to stay nimble and adapt on the fly. In late September, we planned an in-person kick-off event at a university. We expected an audience of between 30-50 students with the catering. However, during the two weeks leading up to the event, rising cases of COVID-19 forced the university to cancel in-person events that featured external speakers. We switched to a virtual format and drew about a dozen students. We also began to more aggressively recruit Project Onramp alumni on LinkedIn. More than half of the students signed up in the final week leading up to the deadline. Throughout September, we were not sure what the final turnout would be even though our partners were still optimistic that students would sign up. While having a critical mass of students was necessary to stress test the model, scaling up the program was not the focus of my work. My supervisor viewed my work as building up the capabilities and defining a roadmap to scale so the program can expand in the future with additional staffing.

In late September, I began prepping for a mid-October public launch during Massachusetts STEM Week. This prep included publishing a landing page, writing press releases, and sending out a personalized social media toolkit to all of our partners and key ecosystem stakeholders. For the Board of Directors, this announcement signaled that we had the capabilities in place to operate at a bigger scale. Putting together a communication plan was important to my supervisor. Public recognition and peer-influence are critical levers in advancing the industry’s CSR agenda. Most of Life Science Cares’

corporate partners are early stage companies without explicitly defined CSR missions. Therefore, looking at what their peers were doing served as informal benchmarks. Additionally, corporate partners expected firm-specific and general recognition that visibly highlights or celebrates industry action. Since Life Science Cares was positioned to spotlight these efforts, I used this public launch to shed light on the network gap. I wrote two press releases that focused on this issue. One was shared by MassBio, the industry's formal trade association in Massachusetts. My intention was to convey the urgency of the problem and motivate Life Sciences Cares and the life sciences industry to take on this challenge.

After the program launched, I focused on engagement and reporting. I drafted templates for recurring newsletters and sent reminder emails to encourage inactive students to schedule meetings. I created an admin dashboard to review meeting activity with my supervisor in our weekly check-ins. We observed significant attrition between students filling out the sign-up form and creating an account on the One-to-One portal (this was our meeting tracker that also featured the volunteer profiles). We also noticed that about half of the students with activated accounts logged their meetings (See Appendix I). My supervisor and I approached these findings with an iterative mindset. The 2020 pilots were implemented very differently so we did not have valid historical data to guide what usage targets were reasonable. Our learnings from the fall motivated me to test a new third-party tool that could match students with volunteers and send meeting invitations to reduce back-and-forth emails. In my ongoing user interviews, students and volunteers expressed support for such a tool. Feeling motivated, I tested this tool's end-to-end user experience in early December. Afterwards, I recommended to my supervisor that we pilot it in the coming year. I wanted to see whether this tool could increase the volume of meetings and engage our inactive students and volunteers.

In mid-December, I proposed three budget scenarios to my supervisor. The first scenario was our base case known as Model A. In Model A, students had access to the entire database of volunteers including three recommendations but could still contact anyone. The second scenario featured this

additional third-party tool mentioned above. The third scenario was a fully-loaded model that added more program management hours for student recruitment and other engagement activities (e.g., career panels, webinars, evaluation). These scenarios averaged between nine to twelve hours of work per week.

In this phase, I began sharing impact stories and technical successes with live data. By early October, we signed-up 116 students and 74 industry volunteers. Using our matching algorithm, I instantaneously matched each student with three volunteers based on their profile data. Then I loaded these matches onto the One-to-One portal where students can view their matches along with the entire database of volunteers. This was an important milestone for my supervisor because I was able to demonstrate that several major workflows were no longer a time consuming process. Up until this point, my supervisor was cautiously optimistic about the technology. As scheduled meetings got underway, I reached out to students and volunteers to gather feedback. I pursued a qualitative approach so I could probe for feedback and potential testimonials if the experience was positive. These meetings occurred from November to February (See Appendix I).

In the fall, I had several opportunities to build momentum with senior level leadership. In late September, I presented to the Board my strategic project. I prepared a send ahead deck with goals, timeline, and operational details. In December, my supervisor updated the Board with testimonial data and key learnings to date. Starting in December, I scheduled meetings with the EDs from our non-Boston affiliates—San Diego, the Bay Area, and Philadelphia. I attempted to assess capacity, interest, and a timeline for potentially deploying One-to-One in their regions.

Automating the matching and letting students track their meetings freed up my bandwidth to focus on other education-related projects. After the public launch in October, I became more embedded in the scaling strategy work for Project Onramp. I was eager to help because I wanted to identify synergy points with One-to-One given that we had recruited many Project Onramp alumni into One-to-One. My

work included participating in external stakeholder meetings, internal working sessions, building pitch decks, and performing data analysis. The outcome of this effort was to develop a three-year strategic plan for Project Onramp to share with our external partners and the Board of Directors. Based on what we heard during our external meetings, we felt that as Project Onramp scales, One-to-One could assist with student recruitment and alumni services after students completed their summer internships. Whereas Project Onramp targeted rising juniors and seniors, One-to-One is open to all undergraduate levels and recent graduates. Personally I felt that the tighter the connection between the two programs, the more compelling it would be for the Board to invest in One-to-One.

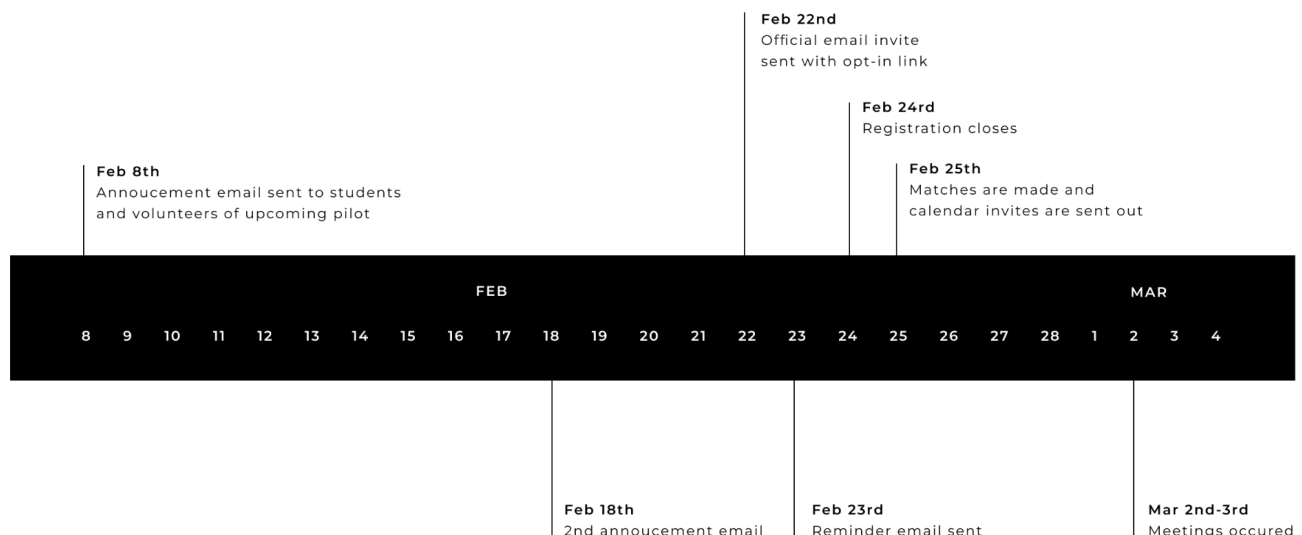
I also took on a leading role in another major effort to streamline volunteer engagement in opportunities related to education and workforce development. In October, my supervisor and I began to deeply collaborate with MassBioEd. MassBioEd focuses on K-12 and adult workforce development with the aim to bridge the gap between education training and life sciences workforce needs. In the fall, my supervisor and I started meeting with MassBioEd's senior team more regularly to understand how the two organizations might better align on career-related volunteer efforts. These meetings were relevant to my strategic project. Since MassBioEd also recruited life science volunteers for education programming, both sides felt this was an area that needed clarity and coordination to reduce confusion in the sector. These meetings led to the formation of a new initiative called the Compass Collaborative. This co-branded partnership positions Life Science Cares to be the primary channel for volunteer recruitment and MassBioEd to be a training provider on education-related volunteer opportunities. Starting in January, I began weekly 1:1 meetings with MassBioEd's newly hired Senior Director of Workforce Development Strategy. These discussions are ongoing with the intention of both organizations agreeing to an MOU, pilot, and public launch in 2022.

Phase 4: Sustain (February - March). During this phase, I focused on improving the student and volunteer experience and communicating with internal stakeholders what an expansion of

One-to-One could look like in our Boston affiliate and nationally. In the fall, about 40% of students with activated accounts reported a scheduled meeting between October and January. In February, we made two changes to the program in hopes of increasing meeting activity. The first was a minor adjustment. We asked any new students who signed up to meet with me for a 15 minute onboarding session. I used these sessions to answer questions, learn from students, and encourage them to think broadly about the purpose of networking. The second adjustment was more substantial. We piloted the third-party tool which I tested individually in Phase 3. The intention was not to replace our fall iteration referred to as Model A in which students initiated contact with volunteers. Instead, we wanted to test whether the new tool could increase meeting activity and if so, determine then how it might affect our model moving forward. I referred to this Spring pilot as Model B. Model B occurred between late February and early March (See Figure 6). Early findings from Model B showed mixed results (See Appendix J). Towards the end of my residency, my supervisor and I agreed to continue adapting Model A and allow additional time to evaluate Model B. This decision was made after considering the risk-return trade-offs and some lingering uncertainties in pivoting to Model B or pursuing a hybrid format (See Appendix O).

FIGURE 6.
TIMELINE OF SPRING PILOT (MODEL B)

This timeline shows key events of our Spring pilot in 2022 (Model B). In this pilot, we used a new tool that automatically matched students and volunteers based on schedule availability and preferred conversation topic(s). We predetermined two days during which meetings can occur (Mar. 2nd and 3rd). 26 students and 20 volunteer signed up for this pilot. See Appendix J for detailed pilot findings.



Evidence to Date

This section is a summary of key evidence thus-far towards the stated goals of my strategic project. This evidence aligns to the inputs and outputs respectively within my theory of action. In addition to this summary, appendices A-O include quotes, survey data, and detailed programmatic findings. My evidence derives from interviews, meeting notes, usage data, and personal observations. Below shows how I collected my data.

- Internal Communication with four stakeholder types
 - Supervisor: Weekly 1:1 and semiweekly all-staff meetings, emails, Slack
 - Team: Biweekly 1:1 with individuals and semiweekly all-staff meetings, emails, Slack
 - EDs at non-Boston affiliates: 1:1 meetings and 1 group update meeting
 - Board of Directors: Group update meetings
- External Communication with five stakeholder types
 - Student Support Partners: Discovery interviews, 1:1 monthly check-ins
 - Corporate Point of Contact: Discovery interviews, email
 - Volunteers: Program survey/usage data, 1:1 semi-structured interviews, email
 - Students: Program survey/usage data, 1:1 semi-structured interviews, email
 - MassBioEd: Group meetings and weekly one-on-one

Overall, my theory of action saw moderate success. I made significant progress in defining the One-to-One model and building the technical infrastructure for future national expansion efforts. My work led to the critical output of my organization adopting One-to-One into its program portfolio and committing to further invest in One-to-One's growth. By extension, this output contributed to greater internal recognition that Life Science Cares can play a more deeper role in education. The urgency to implement One-to-One was not equally felt across the non-Boston affiliates. While the EDs at these sites

were supportive of One-to-One and hopeful they could implement it with additional capacity support, this program was not a priority in the short term. As a starting point, my work has opened the conversation for determining the appropriate timeline and resource needs to expand One-to-One nationally. Furthermore, there is interest from the EDs to revisit One-to-One in the near future now that the Boston affiliate is hiring a staff member who can potentially support a pilot outside of our Boston affiliate.

Below is a summary of evidence towards the four inputs in my theory of action. See Figure 7 for a detailed view.

1. Defining One-to-One's model and value proposition informed by earlier pilots. I had significant success defining how One-to-One works for internal and external stakeholders. When I began my residency, it was unclear how the program should function. The 2020 pilots showed the value of these meetings for students and volunteers. My interviews confirmed these findings and student demand for more networking (See Appendix A, B, and H). While the core idea of one-time networking conversations between students and volunteers remained the same, I made significant changes to the workflows from the pilot. These workflows included how meetings are arranged, how training is provided, and how feedback gets collected. The 2020 pilot findings did contain recommendations for future implementation. However, these early recommendations were not yet validated by our external partners and did not account for process efficiencies gained during my strategic project. During my residency, I tested two low-lift models of One-to-One. As referenced earlier in “Phase 4: Sustain”, we ultimately decided to pursue Model A in the short term (See Appendix O). Model B surfaced more issues despite our intention to make scheduling more convenient (See Appendix J). In Model B, students and volunteers who completed meetings had positive feedback as evidenced by a high net promoter score and match rating. However, two major issues stood out. First, seven out of the 23 meeting invitations had student no-shows. Second, several volunteers told me the new process was complicated and communications were

confusing. Moving forward from an engagement perspective, our focus remains on increasing the volume of meetings among inactive students.

2. Adopting an agile approach to program development and execution. I had significant success adopting an agile approach to develop and run One-to-One. First, I included students, volunteers, and our partners early in the design process. Regarding our program model, one student support partner said, “I love the structure behind the new application process. Allowing individuals to not only apply online but then to navigate their mentors, meetings, etc. on an online portal will be a major plus” (anonymous, personal communication, July 20, 2021). Regarding our student intake form, another student support partner told me in an email: “The goals, interests, geek out questions are great for matching, love them! (anonymous, personal communication, July 20, 2021). Phase 1 discovery interviews (See Appendix A and B), meetings with my supervisor, and the 2020 pilot findings guided what features to prioritize building (See Appendix C). Second, I managed One-to-One in an iterative way, focusing on responsiveness and low-cost tests. Since agile is value-driven as opposed to plan-driven, being responsive to gaps experienced by students and volunteers generated enormous benefit and learnings. On the programmatic level, in mid-fall, we revised sign-up deadlines to better accommodate student support partners despite the previously agreed upon timeline. This decision helped us recruit 30 additional students. On the product side, I made continuous improvements to improve database management and platform load time. Also, the Spring pilot that automated calendar meeting invites was partially in response to students reporting bandwidth issues. While most of these adaptations were technical in nature, we were able increasingly create positive value and make necessary adjustments in a timely manner.

3. Establishing clarity for senior internal stakeholders in One-to-One’s scaling roadmap. I had mixed success building clarity among leadership on how to scale One-to-One in Boston and nationally. Going into my residency, I had hoped to unlock a channel for student recruitment that could expand One-to-One. Starting in Phase 2, it became clear that capacity constraints on the student support

partner side and the lack of student awareness of the life sciences industry would pose major barriers to student recruitment. These factors surfaced during MOU discussions as I tried to determine how many students we could expect from each partner. Given my own limited capacity and our priorities, I had to shift to solving the technical constraints described in the previous section. This way, we could still run the program, gather impact stories, and address how to scale later. In my December and January meetings with the EDs from the non-Boston affiliates, I attempted to gauge their interest in the program and identify resource constraints. The EDs were excited to hear about my progress and expressed their desire to see it deployed in their cities. Out of their interest, I demonstrated the operational and technical scalability of One-to-One. However, these meetings did not get to a point of agreeing to roll out One-to-One in their regions let alone determining what the strategy should be. In my fall presentation to the Board of Directors, they were energized by my progress at addressing the feasibility question of One-to-One. Although I was able to offer high-level possibilities for scale, I did not have a scaling roadmap or stated commitments from the EDs to clarify how One-to-One can become a national program. On a positive note, this did not detract from my team's support to see One-to-One expand in Boston.

4. Providing evidence of impact and technical successes early and along the way. I had mixed success capturing and communicating wins. Despite solving major inefficiencies through automation and building momentum with senior leadership, there were still programmatic areas needing improvement. We had recruited a large number of students but only about half activated their One-to-One accounts. Of that number, about half self-reported having scheduled meetings. Not achieving more volume constrained us to more qualitative indications of student impact. Furthermore, since my focus was on students, I had less data to show the impact of these meetings on the volunteers themselves. My interviews did suggest that increased personal satisfaction and fulfilling a sense of moral obligation could serve as future metrics (See Appendix B). By the end of January, I did manage to collect powerful testimonials evidenced by these one-time meetings turning into long-term mentorships, company visits, and internship referrals (See Appendix H). One student said, “She [Volunteer] not only cared about helping me on the academic side

and looking for opportunities but also gave me advice to have clearer ideas about what I was looking for and made me rethink twice many decisions which I thought I had already decided, see them in another way” (anonymous, personal communication, November 4, 2021). Another student said, “I was never really into industry. I always thought I was going to do academia but touring the lab for sure got my mind thinking! To see that the work and research conducted in the biotech lab directly impacted people’s lives in a positive way was really cool” (anonymous, personal communication, December 2, 2021). Of the 19 students I interviewed, almost all of them told me they did not know a single person working full-time in their career of interest prior to engaging with One-to-One. When I shared this insight with my supervisor in late fall, she became even more engaged in the cause; she then shared this insight with the Board of Directors in a December meeting.

These testimonials were important to our student partners. Even though I was managing their expectations in terms of overall student activity, the stories of impact were seen as a north star for the program. They kept our partners engaged in the cause. I found it helpful to also frame my strategic project as the baseline and that things can only improve from here. As a result, our student support partners wanted to continue advertising the program. One partner wrote to me, “this program is proof” referencing one story of a graduating senior who landed a full-time role through networking in One-to-One (anonymous, personal communication, January 20, 2022).

Regarding our fall implementation (Model A), I did not encounter any concerns from our corporate partners on not having enough meetings or experiencing scheduling mishaps (e.g., student no-shows or late cancellations). I was diligent in my communications to indicate that unlike traditional mentorship programs, One-to-One does not guarantee meetings with students. For our corporate partners, not having any meetings was the looming risk that could negatively affect Life Science Cares’ reputation. Although we did not aggressively survey the volunteers, the few that did reach out to me personally had one-off issues that I was able to resolve quickly. My supervisor viewed the absence of any complaints as a

lagging indicator that our careful messaging was effective. This HR director's email to me captures the eagerness and flexibility of the One-to-One volunteer base: "Let me check when I last shared with the team to see if we have some new hires to help with your needs. If so, I'll let you know, if not, totally understand the supply/demand issue. Thanks!" (anonymous, personal communication, February 7, 2022).

The four inputs above influenced progress on my outputs. Below is a summary of evidence towards the three outputs in my theory of action. See Figure 8 for a detailed view.

1. The organization's commitment to sustain the program. My efforts led to significant success in getting the leadership to continue supporting the program. Prior to my residency, my supervisor did not believe that implementing One-to-One in the same way as the 2020 pilots would make strategic sense. After overcoming major technical hurdles, the program became feasible to sustain. My supervisor asked for a budget proposal in December. I delivered the budget which was approved by the Board of Directors in the Spring. This budget featured a new workforce development team member to oversee One-to-One's growth specifically for the Boston affiliate. Furthermore, the founder of Life Science Cares now sees One-to-One as a permanent programmatic feature of Life Science Cares. While he has always been excited by the program's potential, now he is publicly sharing the program with his peers and has invited them to sign up as volunteers.

2. Greater internal recognition that the organization should play a more expansive role in education and workforce development. My efforts led to mixed success in getting internal stakeholders to believe they should pursue more opportunities in the education space. On the one hand, I gathered evidence to suggest a greater appetite to deepen our commitment in education since the start of my residency. The Board of Directors decided to commit more resources to existing programs that served students. The new workforce development role would support education-related projects beyond One-to-One. My supervisor also began testing the messaging of education and workforce development in

conversation with funders. Whereas the organization has historically focused on grant giving and sourcing volunteer opportunities from its nonprofit grantees, we are now testing the language education and workforce development in our written collateral. In addition to sustaining One-to-One, two other major education workforce efforts are underway: Project Onramp and Compass Collaborative. Getting to shape the strategic vision behind all these programs has allowed me to identify opportunities for synergy. For example, One-to-One and Project Onramp together can attract an ecosystem of student support partners that are important to both programs. As part of the Compass Collaborative agreement, MassBioEd is willing to create training materials that could be used to support One-to-One volunteers and aspects of Project Onramp. As further evidence, in January, our Head of Programs introduced me to two of our recent nonprofit grantees who expressed interest in participating in One-to-One. These developments suggest my organization's growing commitment in education.

On the other hand, it is still early to determine if Life Science Cares nationally is willing to adopt an explicit education and workforce strategy. Even though the non-Boston affiliates were preparing to launch Project Onramp, these efforts were perceived as special projects not tied to a broader education strategy. When I asked one ED whether she has ever pitched an education or workforce strategy, she told me, “No, I don’t use that messaging when I talk to anyone (anonymous, personal communication, January 20, 2022). In several 1:1 meetings, my supervisor told me that the organization must carefully balance pressures to develop more in-house programming with our core value proposition as a connector in the ecosystem. Even though we were deepening our efforts in existing programs, it was unclear whether we would take on new education projects. In January, my supervisor shared with our team the 2022 strategic plan from the Board of Directors. This plan called out the desire to create “a moonshot program” which can be a new effort or an expansion of an existing strategy. Based on my observation in the fall Board meetings, there was no suggestion of exploring new opportunities in education. Instead, there was interest in pursuing a new initiative in healthcare equity.

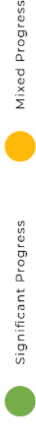
3. New resources and partnerships that Life Science Cares can rely on to scale its collective impact agenda nationally. My efforts led to mixed success here. The technical infrastructure is now in place for expanding One-to-One to the non-Boston affiliates. The MOUs and communication templates can be adapted for other markets. However, the partnerships on the student side are mostly local to Massachusetts with the exception of a few national nonprofits. Without a national level staff member to manage the day-to-day operations of One-to-One, the non-Boston affiliates said it would be difficult to adopt the program at their current level of staffing. Assuming the non-Boston affiliates do not commit additional capacity to One-to-One, there are several ways to still meet this need. Life Science Cares can create a national position for One-to-One or allow the upcoming workforce development hire at the Boston affiliate to take on strategic work for a national scale-up. Until one of these options is pursued, the resources and partnerships I have developed are not likely to be leveraged by the non-Boston affiliates.

Looking across the evidence base in my theory of action, I made considerable progress towards my primary goal: building a foundation for One-to-One to scale. Although student recruitment will remain an ongoing challenge, I did overcome major technical hurdles, enabling my organization to fully adopt One-to-One into its portfolio of offerings. These hurdles unresolved would have made it impossible for the organization to operate the program despite internal interest to support it. Beyond achieving my primary goal, I have evidence to suggest that One-to-One created the need and opportunity for the organization to seek stronger alignment and synergy across its programs in education outside of its main philanthropic objectives. One-to-One, Project Onramp, and Compass Collaborative are starting to form one coherent strategy around education and workforce development for Life Science Cares Boston. This is evident in the role description of the new workforce development hire and how my supervisor has been pitching to funders. Given the short duration of my residency, I made less progress in areas outside of solving critical operational challenges and getting internal commitment to expand One-to-One. As evident in the program feedback and conversations with team members, there is room for growth regarding student recruitment and meeting experience between students and volunteers.

FIGURE 7.

SUMMARY OF KEY EVIDENCE FOR INPUTS IN THEORY OF ACTION

This table illustrates my progress along the inputs in my theory of action. Evidence is summarized across the 4 phases during my project.



Input	Progress	Evidence from Phase 1: Learning & Planning	Evidence from Phase 2: Build-Out	Evidence from Phase 3: Implementation	Evidence from Phase 4: Sustain
Define the One-to-One model		Application Lifecycle Management 2020 pilot findings showed that the core value proposition is compelling for students and volunteers. "Allowing individuals to not only apply online but then to navigate their mentors, meetings, etc. in an online portal will be a major plus." - from a student support partner. Consulting on Adjacent Projects - During July strategy planning calls, corporate stakeholders verbally stated common interest to engage with racially diverse college students.	Mobilizing Partnerships - Student support partners provided individual feedback to the MOU draft and student sign-up forms. Their feedback was adopted into the final program model. - Subsequent conversations helped finalize a standardized MOU and a set of student/volunteer instructions. All partners agreed on common expectations for the program.	Data Analysis and Communication - Students and volunteers who completed meetings provided positive feedback of their experiences (Appendix H). This further validated the One-to-One model and value proposition. - Early data gathered from student demographic surveys further validated the problem we sought to address (Appendix D).	Data Analysis and Communication Between February and mid-March, I had several meetings with my supervisor to discuss what the model for One-to-One could look like for our Boston affiliate (Appendix O). Our Spring pilot was inconclusive (Appendix J). We decided to continue with Model A in which students initiate outreach with volunteers by email. We will recruit partners opportunistically in the short term. We will run more surveys to understand trade-offs with assigned meetings and automated calendar invites.
Adopt an agile approach		Application Lifecycle Management - My supervisor agreed with my plan to first conduct qualitative interviews with students and volunteers to inform technology needs; 2020 pilots only had survey data. - Early interviews validated initial assumptions behind the criteria for matching students with volunteers. - I used interview data and meetings with my supervisor to identify and prioritize key functionalities (Appendix C).	Application Lifecycle Management - Between July and August, I built two web apps and a database that automated matches between students and volunteers, tracked meeting activity, and captured student and volunteer sign-ups (Appendix K, L, M). - By reducing the time it took to generate matches and successfully deploying a database, managing the program was no longer a time-consuming process. Program Management - I designed marketing collateral (flyers, decks, videos) to support student and volunteer recruitment. Partners gave positive feedback on the marketing materials over email and during planning meetings.	Application Lifecycle Management - I cleaned up the code to reduce execution time and improve readability. - The matching algorithm saved time which opened bandwidth for me to iterate on student recruitment and mitigate risks associated with the overall user flow (Appendix N). - Based on partner feedback, we moved Round 2's deadline from early December to early February to allow more time for student recruitment. I also added a 15 minute training call with me in the student's sign-up process. 9 out of 30 students who signed up in Round 2 participated in these calls. Program Management - In late February, we began a Spring pilot known as Model B. In Model B, we tested a new tool in that automatically sends a calendar invite to students and matched volunteers. 26 students and 20 volunteers signed up for this pilot. We made 23 matches. Evaluation is ongoing (Appendix J).	Application Lifecycle Management - Based on student feedback, I updated the student interface on the One-to-One portal to increase visual appeal and make their experience more intuitive. Program Management - In late February, we began a Spring pilot known as Model B. In Model B, we tested a new tool in that automatically sends a calendar invite to students and matched volunteers. 26 students and 20 volunteers signed up for this pilot. We made 23 matches. Evaluation is ongoing (Appendix J).

CONT'D ON NEXT PAGE

FIGURE 7. CONT'D

SUMMARY OF KEY EVIDENCE FOR INPUTS IN THEORY OF ACTION

This table illustrates my progress along the inputs in my theory of action. Evidence is summarized across the 4 phases during my project.

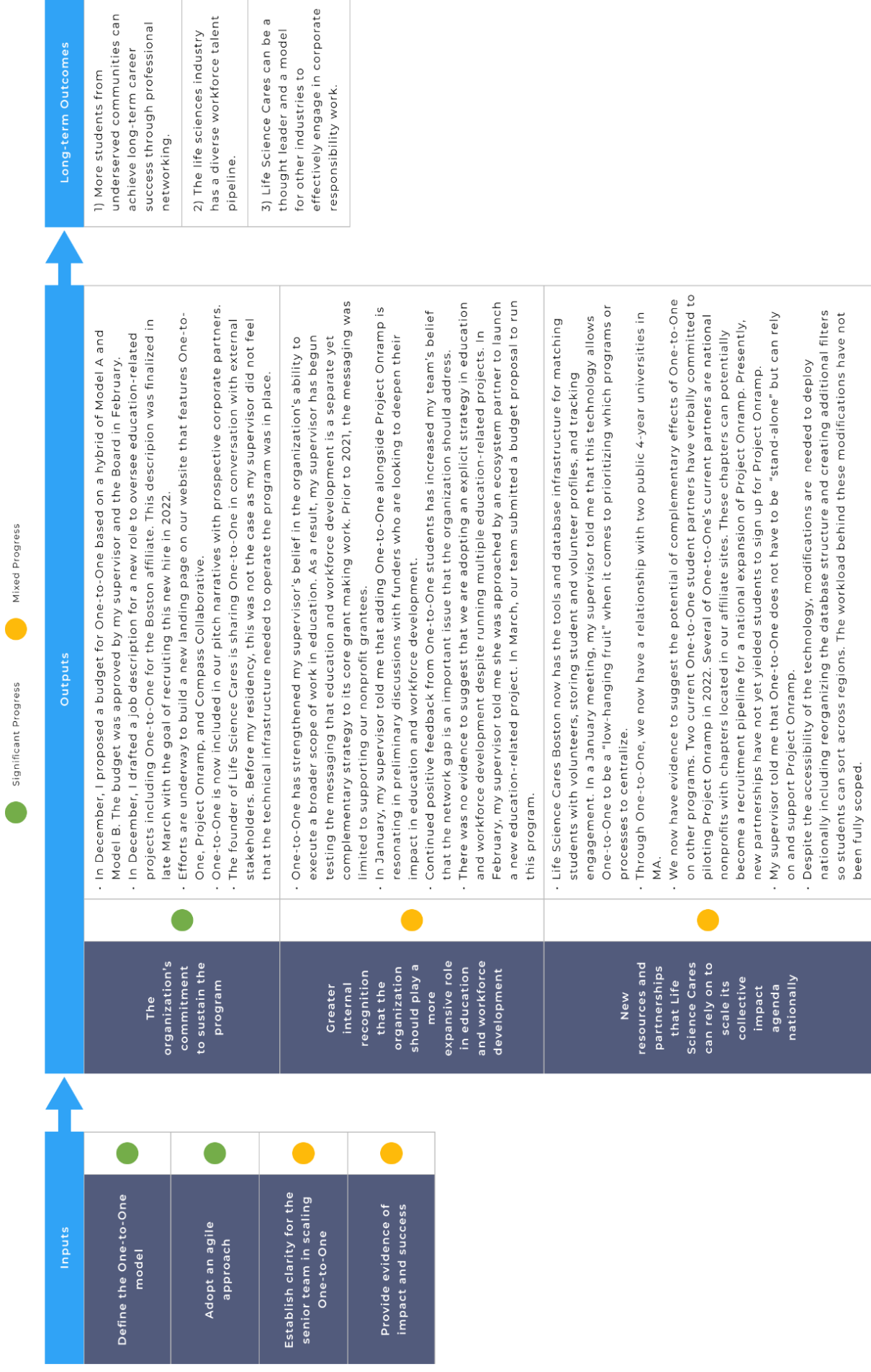
● Significant Progress
 ● Mixed Progress

Input	Progress	Evidence from Phase 1: Learning & Planning	Evidence from Phase 2: Build-Out	Evidence from Phase 3: Implementation	Evidence from Phase 4: Sustain
Establish clarity for the senior team in scaling One-to-One	●	Application Lifecycle Management - In June meetings, 2 team members said One-to-One's short-term priority is to improve program capabilities to serve more students. - In July, I shared my analysis and recommendations with my supervisor to pursue a low-code solution rather than enterprise mentoring software. This approach would allow us to learn, iterate, and reduce any risk of platform fatigue. My supervisor agreed with my recommendation. Data Analysis and Communication - My supervisor in my 1:1 meeting gave verbal support for me to present to the Board of Directors in September.	Data Analysis and Communication - In August, my supervisor stated that the path to scale was becoming clearer after seeing a demo of the technology on the dummy data set. - In an August meeting with the EDs from the affiliate sites, the EDs expressed interest to launch One-to-One at their sites. This meeting was an opportunity for me to introduce the program and start to build a relationship with the EDs. - In a September Board meeting, I presented my strategic project. The Board was grateful I could focus on this project and was excited by the anticipated process efficiencies.	Program Management - I proposed a budget to my supervisor based on different scaling and resource scenarios. The budget was approved in January. Data Analysis and Communication - In my check-in meetings, my supervisor was pleased to that our tools removed major time bottlenecks. - From December to February, I met with EDs from the non-Boston affiliates to gauge capacity to launch One-to-One. EDs were excited about the program but did not see One-to-One as a short-term priority. I was unable to gather insights to inform how to deploy One-to-One nationally.	Data Analysis and Communication - In March, my supervisor and our Head of Programs told me in separate meetings that our Boston affiliate will continue to expand One-to-One under the Fall format (Model A). - No concrete goals were set for scaling One-to-One except finalizing the job description for a staff member to oversee One-to-One. - In the short term, we made the decision to opportunistically recruit student support partners for One-to-One.
	●	Mobilizing Partnerships - During July discovery interviews, student support partners (nonprofits and colleges) expressed interest to participate in One-to-One and saw this program meeting broader strategic priorities. - The program model emerging from discussion with partners seemed feasible to my supervisor and I from a capacity and timeline perspective. - During July interviews, students said they wanted to do more networking but barriers existed, confirming the need from this program (Appendix A). - During July interviews, volunteers shared insights behind their motivation to participate, confirming the need for this program (Appendix B).	Application Lifecycle Management - I successfully tested all the tools using dummy data; my supervisor was encouraged by these results during our early fall meetings. Mobilizing Partnerships - My supervisor was encouraged to see 4 signed MOUs and one verbal agreement with our student support partners. We also recruited 11 corporate partners with about 5-10 employees per firm.	Mobilizing Partnerships - We recruited 116 students for the Fall launch, exceeding our initial goal of 100. We also recruited 74 volunteers, exceeding our initial goal of 50 (Appendix I). Data Analysis and Communication - The usage data showed a steady increase in meetings scheduled since launch (Appendix I). - During Round 1 (Oct. - Jan.), ~50% of students activated their accounts on the One-to-One portal. ~40% of those students met the requirement of completing at least 1 meeting per round (Appendix I). - After reviewing the user profile data, I told my supervisor there were disparities between students expectations and what the volunteers could offer (Appendix E, F, G).	Data Analysis and Communication - In my final round of interviews, students and volunteers shared positive feedback about their meetings. The students came from STEM and non-STEM backgrounds. This validated One-to-One's potential to appeal to a diverse background of students (Appendix H). - Some students expressed the need for additional training and more responsive user experience in the One-to-One portal (Appendix H).
Provide evidence of impact and success	●				

FIGURE 8.

SUMMARY OF KEY EVIDENCE FOR OUTPUTS IN THEORY OF ACTION

This graphic illustrates my progress along the outputs in my theory of action. The outputs are in the center table. The far-right table lists the long-term outcomes. These long-term outcomes were not tracked given the short duration of my residency.



Analysis

In this section, I describe why my outcomes occurred the way they did. I revisit the concept of public value to frame the factors that enabled and limited my progress (Leonard & Moore, 2012). Specifically, I investigate how these factors influenced my project's public value proposition, operational feasibility, and social legitimacy.

Public Value. Public value is a social outcome that should be valuable and desirable (Leonard & Moore, 2012). How my organization perceived the public value of One-to-One greatly influenced the support I received and my goal to gain internal commitment to expand One-to-One post-residency. First, my project's intended impact appealed to the emotions and values of my team and the Board of Directors. As Sutton (2014) points out, clear solutions to emotional hot causes can build the case for change. In my context, One-to-One offered a cool solution to the network gap issue that the Board cared deeply about. This solution also seemed rational since my team already believed that strategic connections can have a profound impact on students' opportunity for economic mobility. Knowing that the life sciences industry contains enormous social capital, my team felt passionate to explore the industry's role here. Second, Project Onramp magnified the network gap issue among senior leaders. As Life Science Cares' flagship program, Project Onramp's high touch model that layered mentorship support on top of its internship component proved effective at increasing students' interests in the sector. Both the founder of Life Science Cares and my supervisor were curious if we could extract the mentorship component out and deploy it at scale. Their proactiveness reflects the literature that shows firms thrive when senior leaders take responsibility for innovation instead of focusing solely on core business activities (Tushman et al., 2011). Whereas Project Onramp was a labor-intensive operation, a complimentary low-lift solution such as One-to-One was an attractive innovation to explore. Finally, my team was hopeful that One-to-One could engage more volunteers since the program was low commitment and could run throughout the year.

Early on, my supervisor did not describe One-to-One as a STEM education effort. Instead, my

project was perceived as an anti-poverty strategy. My supervisor knew that social capital was missing in these communities. Solving the network gap was directly linked to the organization's social mission. My supervisor expressed early on that the primary goal of One-to-One was not to funnel as many students as possible into life science jobs. This was not practically possible since many high paying roles still demand advanced education and the timescale to see that through was not feasible for Life Science Cares. Instead, the aim was to provide students from underserved backgrounds and all majors with the social capital and transferable soft skills to explore careers in all sectors including life science adjacent industries like healthcare and professional business services. This perspective **created the conditions to adopt an agile approach** in my project. Because my project was not tied to a career placement objective (in contrast with Project Onramp), I was able to build One-to-One more holistically around student needs and outcomes they valued. This student-first approach aligns with Rigby et al.'s view that "customers are the best judges of what they want" (Rigby et al., 2020, p. 101). My early discovery with volunteers was also revealing. Volunteers were eager to support students beyond career guidance and did not view students with non-life science career aspirations as a turn-off.

Student support partners saw the need for One-to-One. They perceived One-to-One as an opportunity to fill gaps in their own programming and strengthen existing efforts to connect students with industry. Their support was critical because I was able to use early discovery conversations as a sounding board for **defining the model of One-to-One**. This participatory strategy was intentional as ideas are best sourced when experiments are conducted "with the public" rather than "on the public" (Weiss, 2021, p. 111). The 2020 pilots placed enormous time constraints on student support partners. My approach was to uncover what model would be most sustainable for an ongoing partnership. These discovery calls led to the determination that three rolling deadlines a year allowed ample time for student recruitment. Requiring at least one new meeting every semester seemed doable for students. Allowing students to select who to contact was a selling point for students and our student support partners. As MOUs got signed, this validation became **evidence of impact which I shared** with my team.

The benefits of One-to-One were apparent to my supervisor and the Board of Directors from the 2020 pilots. This drew their attention towards how to sustain it. They wanted to prioritize building a foundation for scale before doing any scaling work. Without the added pressure to aggressively recruit students and volunteers in the short term, I was able to focus on building and testing the technical infrastructure for One-to-One. This priority was clear and consistent throughout my residency and ultimately allowed me to **share technical successes early and along the way**. Solving these technical barriers was the primary reason that my supervisor and the Board decided to expand the program. The testimonials that I gathered along the way became additional motivation for investing in the program (See Appendix H).

Towards the end of my residency, my supervisor was able to see how One-to-One, Project Onramp, and Compass Collaborative could be mutually reinforcing. This recognition strengthened the case to continue supporting One-to-One. One-to-One was perceived as part of a larger coordinated effort to create value for external stakeholders. This clarity and alignment enabled my project to tie in to core outcomes important to the organization. Furthermore, One-to-One was viewed less as a stand-alone program, but more so a value-add offering to our other initiatives. My supervisor saw One-to-One evolving to fill gaps that Project Onramp in its current form is unable to address. Such measures include building a funnel for Project Onramp student recruitment, improving student internship experience, and brokering connections for students after their internships. While my supervisor had a sense of these gaps early on, the cross-sector strategy meetings confirmed that these were real needs felt by our corporate and nonprofit partners. Discussions with my supervisor and our Project Onramp manager reinforced internal recognition that we should keep exploring how to make One-to-One work. As a result, we were willing to iterate frequently and deeply even if that meant testing a completely new model in the Spring (See Appendix J). This willingness **seeded a strong agile culture** and improved my ability to **define One-to-One's model**. Below I adopt Rangan et al.'s Cross-Theater CSR Framework (2015) to illustrate how my team perceived synergy across our three education-related projects and the degree of alignment

towards creating value for our corporate partners. Figure 9 shows this alignment and how value creation is spread across the three theaters: 1) philanthropy 2) short-term operational improvements and 3) long term business model transformation. Looking across my involvement in all three education-related projects, achieving mission and strategy coherence increased my team's internal support of One-to-One's continued expansion. This is consistent with CSR research that shows impact is maximized when initiatives are interdisciplinary and coordinated (Rangan et al., 2015).

FIGURE 9.

ACHIEVING CSR COHERENCE OF LIFE SCIENCE CARES' EDUCATION-RELATED PROJECTS

I adapted Rangan et. al.'s (2015) framework to show how internal stakeholders perceive alignment between Life Science Cares' 3 education-related projects in terms of value created for our corporate partners. This value is spread across 3 theaters: 1) philanthropy 2) short-term operational improvements and 3) long term business model transformation. One-to-One is perceived to be value-add because it contribute to the goals of other programs in addition to addressing the network gap issue.

	Theater 1 Philanthropy	Theater 2 Operational Improvements	Theater 3 Business Model Transformation
	Reinforce an individual or firm's commitment to social justice and equity across corporate partners	Improve corporate partners' operational efficiency, time savings, and brand value	Provide significant impact on corporate partners' business and financial performance
FOCUS AREAS			
Education <i>Increasing underserved students' access to enriching educational experiences, social capital, and economic mobility</i>	One-to-One & Compass Collaborative • Volunteer fulfillment • Giving back • Enhanced reputation and social standing of individual volunteers Philanthropy to education nonprofits • Entry point to do CSR work • Corporate volunteerism	One-to-One & Compass Collaborative • Employee engagement can employee satisfaction, leading to improved retention • Strengthen team culture when multiple volunteers participate from the same firm Compass Collaborative • Greater selection of volunteer opportunities in education • Convenient training support to deliver more effective volunteer engagements Project Onramp • Corporate participation in Project Onramp increases firms' social standing and brand	One-to-One & Compass Collaborative • Corporate volunteerism is integrated into company culture • CSR mission is explicitly defined and has ties to business goals
Workforce <i>Increasing underserved students' access to internships and career pathways in the life sciences industry</i>		Project Onramp • Life Science Cares takes on the role of sourcing and screening diverse talented candidates which reduce workload of HR units • Corporate partners can meet DE&I objectives around diversity hiring	Project Onramp • Sustainable model among smaller corporate partners like startups to recruit diverse talented students into the industry • Build the pipeline of diverse talent who can be promoted to executive positions over time One-to-One & Compass Collaborative • Corporate mentoring and career-related events can build a direct pipeline to the workforce (e.g. One-to-One students who are senior/recent college grads can readily able to enter the workforce)

While the Boston affiliate was committed to growing One-to-One, I had limited success determining what scaling could look like at the non-Boston affiliates. These affiliates had different priorities as they were at much earlier stages of development. It is also important to note that they had not yet completed a summer of Project Onramp at the time of my residency whereas our Boston affiliate had already completed our third year of Project Onramp implementation. At the non-Boston affiliates, other priorities took precedence over One-to-One which detracted from my effectiveness at **establishing clarity in One-to-One's scaling roadmap** at the national level. Nonetheless, the EDs believed in the value of One-to-One. One ED mentioned in reference to One-to-One: "This resonates with me and feels much more like meaningful volunteer work" (anonymous, personal communication, January 20, 2022). Realizing that the timing was not ideal to dive deeper into One-to-One with the other affiliates, I did not progress further than discovery calls. Instead of making any recommendations, I asked the EDs what possibilities they perceived in addressing the network gap in their respective regions. Getting the EDs to practice possibility thinking allowed me to maintain their curiosity which I felt was important at the time. According to Weiss (2021), possibility thinking can spark a leader's perception of opportunity beyond the resources at hand. Not dismissing the need for resources, Weiss goes on to say this perception of opportunity can garner capacity through staged commitments and agile delivery. By the end of these calls and in follow-up communications, the EDs told me they were open to revisiting One-to-One after the summer of 2022.

Ultimately, how One-to-One expands nationally is tied to Life Science Cares' broader organizational strategy to pursue a national scale-up model while balancing local affiliate autonomy. One organizational structure that has been discussed is to create a unified national office to increase donor visibility and free up affiliates from managing time-consuming functions like HR, IT, and finance. In this structure, a centralized operator can potentially own and manage One-to-One. Alternatively, One-to-One can remain affiliate-driven with technical support from a national team (e.g., database management and reporting). Besides staffing and cost-sharing uncertainties, messaging alignment is also a consideration.

One question sensitive to the Board of Directors is how Life Science Cares can establish a coherent brand position as programs expand and more get added. In the fall of 2020, the organization commissioned an internal survey of its 170+ Board of Advisors to understand how to effectively engage them. The Board of Advisors are individual financial contributors and champions of the Life Science Cares mission within their firms. One theme that emerged from the survey was the need to clearly articulate what the organization does and the impact it has. These findings encouraged me to slow down my efforts to seek clarity in how to scale One-to-One across the affiliates. Doing so would allow the organization to prioritize our messaging strategy from which One-to-One also benefits. This aligns with recent literature on scaling that says the separation between core business and explorative innovation is insufficient “to win in non-incremental innovation” (Ohr & Mattes, 2018, para. 13). Scaling up requires improving the system’s responsiveness to absorb the innovation (Ohr & Mattes, 2018). After we secured a multi-million dollar commitment for Project Onramp near the end of my residency, I observed the organization was entering a phase in its organizational complexity during which reducing cognitive load became vital. The need for Life Science Cares to clarify its overall model and strategy to reduce internal and external cognitive load became a more time-sensitive matter than determining our scaling strategy for One-to-One. While my supervisor and the Board of Directors envisioned One-to-One as a national centralized program, I observed a greater internal urgency to achieve organizational coherence and alignment on messaging before determining what national scale means for One-to-One.

Operational Feasibility. Access and ability to deploy resources is required to create public value (Leonard & Moore, 2012). Looking back at my residency, I was attentive to resource constraints but was not constraint-driven. Being constraint-driven is a hallmark of the prevailing “scarcity mindset” that undermines innovation in the public sector (Weiss, 2021, p. 33). In contrast, an “abundance mindset” believes that resources are there but requires creativity to marshal them (Weiss, 2021, p. 33). Abundance thinking motivated me to unlock new capacity by leveraging three power bases. These were mentorship from my team, an organizational culture that values innovation and agile delivery, and the skills I brought

into residency. At the same time, capacity constraints among student support partners and the non-Boston affiliates did limit my progress.

From a mentorship perspective, I continuously sought out and received feedback from all team members at our Boston affiliate. My team has deep experience across corporate philanthropy, corporate volunteerism, and public communications. In my early communication with volunteers, my supervisor and our Head of Programs gave me feedback on language to ensure we could effectively manage their expectations. My weekly 1:1s with my supervisor offered time to debrief my interactions with our partners which fueled **my agile approach to program development** because we were able to make rapid decisions together. When we had to decide on the programmatic features of One-to-One, my supervisor supported my analysis and encouraged me to move forward. Even though we had to make many assumptions and did not have much historical data, we did not stall at this stage. Instead, the attitude was a test and see approach. My supervisor, the Head of Programs, and the Project Onramp manager introduced me to corporate partners and nonprofit grantees. These introductions allowed me to cultivate relationships and secure initial commitments to participate in the program. As I took on more leadership roles in our adjacent education-related projects, my team helped me ideate strategy and tactics. Their input informed the design of key deliverables that subsequently became artifacts for **communicating early wins**. For example, I relied on the Project Onramp manager for past examples of MOUs and her expertise in preparing college students for engaging in professional communication. This helped me craft the One-to-One MOUs and program instructions, which became evidence of the partnership-building work I did.

In terms of culture, my organization was innovative and willing to try new technologies. This willingness to continuously experiment enabled me to **adopt an agile approach** for my own project. My team's openness for experimentation was rooted in the performance-oriented nature of our team. While my project was unfolding, the organization was also innovating to execute their core grantmaking

objective. In the fall, Life Science Cares overhauled their grant making processes to ensure the organization was best situated to meet its grantmaking goals. To do this, the organization deployed a new technology platform and revamped its grantmaking criteria. This meant more work on the frontend. However, it led to a more thorough application review conducted by our Board of Advisors and ultimately, a more diverse grantee portfolio. Seeing how my team adapted to new technologies increased my feelings of psychological safety. Amy Edmondson (1999) describes psychology safety as “the shared belief that the team is safe for interpersonal risk taking” (p. 354). Feeling psychologically safe encouraged me to recommend piloting Model B despite anticipating some of the risks.

Whereas some efforts followed a more structured process (e.g., our fundraising and development model), other efforts intentionally adopted an agile approach. This intentionality unlocked capacity across the organization, allowing us to commit resources in stages for new projects. Over time, this practice enabled me to **define the One-to-One model**. I attribute this intentionality to my supervisor’s emphasis on learning. Rather than expecting success, we approached Model A and Model B as tests. This is consistent with Weiss’ view that if “pilots” are tests, then one should “promise learning, not success” (Weiss, 2021, p. 111). We saw potential benefits of Model B but we were not certain it was going to work. Though it still holds promise, Model B raised more issues than I anticipated (See Appendix J). Our findings support the argument put forward by Dixon et al.’s that customers tend to prefer an effortless experience over “moments of wow” (Dixon et al., 2013, p. 121). My supervisor shared this belief by saying, “You can build all the apps and online tools in the world, but if users don’t see a need for what you’re offering and don’t find it easy to navigate, you aren’t having an impact” (my supervisor, personal communication, March 7, 2022). My own experience of agile is that it should imply improvement rather than a pace of change. Taking this to heart, we put Model B on pause to allow us additional time to investigate. This decision also reflects the literature that warns against premature scaling (Sutton & Rao, 2014; Weiss, 2021; Kahneman, 2011). According to Kahneman (2011), in a “cognitive minefield”—many uncertainties, high risks, a complex problem—the best thing to do is to slow down and process (p. 417).

I leveraged my position, expertise, and relational power to drive my work forward. My team viewed me as a subject matter expert on issues related to education and workforce development. Before my strategic project was fully defined, I was invited to internal and external planning meetings for Project Onramp. In these strategy calls with our cross-sector advisory aboard, I took notes and synthesized recommendations which were shared afterwards. In August, my supervisor asked me to strategize around the potential collaboration with MassBioEd which would later become the Compass Collaborative partnership. These engagements were early opportunities for me to build credibility while still learning about the sector and the organization. I also brought the expertise to execute our technical vision for One-to-One. In this case, my knowledge of R and past experience as a Product Manager at a high growth start-up gave me the know-how, analytical skills, and prioritization techniques for my project. From a relational standpoint, my leadership approach is highly alignment-driven and input-seeking. In my early meetings with the student support partners, I tried to uncover their values and goals so I could learn to adapt my pitch. As I spoke with more stakeholders, I referenced past conversations and listened for any disconnect or pushback. I asked them directly to help me strategize what a high-impact, sustainable model of One-to-One could look like for them. These conversations built trust. When stakeholders learned that our interests were aligned and that Life Science Cares' strength was in mobilizing volunteers, they became comfortable with me taking an iterative approach to address tactical uncertainties (e.g., determining deadlines, increasing student engagement, measuring impact etc). One explanation for this trust comes from research on trust models (Hurley, 2006). Hurley (2006) argues that tending to situational factors (e.g., high alignment of interests and perceived capabilities) can compensate for individual-level factors like having a low personal tolerance to risk. Overall, input from student support partners throughout my residency helped me **define One-to-One's model**. I viewed our student support partners as co-designers as I relied heavily on their feedback to shape the decisions I made.

As the lead on One-to-One, I had to be mindful of my own bandwidth. I was the only person on my team who could implement new product features because I held the technical expertise. Given the

limited duration of my residency, I prioritized the must-have features knowing that solving the most critical problems would secure the runway for future improvement. Because I was both building the tools and running the program at the same time, I had limited capacity to engage inactive students. This made it difficult to capture and **share evidence of impact** at the velocity I had hoped. Until we are able to show more evidence of impact, I sensed less urgency to formalize a comprehensive strategy in education and workforce development. One possible explanation for decreased urgency is reflected in the change management literature. Urgency drops when managers do not intentionally plan for or create short-term wins (Kotter, 1995). Our successes during the fall focused on operational feasibility not engagement. In the low-touch model I developed, I sent out newsletters and targeted email reminders to inactive students. In the absence of other touchpoints, I suspected these email communications were not effective at engaging students who were too busy or shy to schedule meetings. Through my interviews, I observed that there was demand from students to attend career panels and company visits. From the corporate side, volunteers wanted to do more. Even though I saw the value of these activities from an engagement standpoint, I did not prioritize them over achieving feasibility and the promise for scale. This was a natural tension for me. On the one hand, focusing on “short-term actions that make scaling easier down the road” can improve feasibility, a clear outcome of my project (Sutton & Rao, 2014, pg. 19). On the other hand, pursuing such actions within an agile environment can risk deprioritizing end-user needs. This is consistent with research that shows agile practitioners are often at odds with a manager’s need to shape or control innovation—as was One-to-One’s case needing to meet a feasibility criterion (Rigby et al., 2020).

Capacity constraints among our student support partners limited my ability to **establish clarity for One-to-One’s scaling roadmap** locally. Our student support partners were responsible for recruiting students. The format and frequency of their outreach effort varied. With our higher education partners, messaging can come from multiple sources. When a career center staff shares One-to-One with a professor, that professor is able to advertise the program to students. Students may also discover

One-to-One on their career portal or college social media. For our nonprofit partners, this work depended on a single person to push out newsletters or conduct targeted outreach. While we had to rely on internal champions with all of our partners, the nonprofits typically had a more personal relationship with their students. These variables altogether made it difficult to predict student participation, measure the effectiveness of recruitment, and detect any patterns between engagement and our recruitment channels. These uncertainties slowed down my attempt to gauge the optimal supply-demand of volunteers and students. Looking back at my literature review, I learned that aggregating supply and demand increases the value of network effects in successful platform businesses (Zhu & Iansiti, 2019; Yoffie et al., 2019). Since network effects require a critical mass of active users, our challenges in student recruitment limited my ability to clarify the scale at which we should engage our volunteers if the Board of Directors were to set specific meeting targets for One-to-One in the future.

Two internal structural factors detracted from my progress in **establishing clarity for One-to-One's scaling roadmap** at a national level: limited bandwidth across the non-Boston affiliates and the decentralized format of the organization. First, with only one or two full time staff members including the ED, these affiliates did not have the time to deeply plan for One-to-One. Second, across the affiliates, their objectives were similar but their scope of activities varied greatly and depended on assets and stakeholder interests in their regions. Thus, operationalizing One-to-One across the affiliates would require some degree of customization. The scalability of One-to-One's technical architecture enables One-to-One to be a national centralized program, a view the EDs shared and supported. However, they expressed process uncertainties regarding ideal tactical hand-offs between local and national control. They envisioned different workflows for themselves based on the amount of control they wanted to maintain or their ability to outsource the student recruitment work. In the short term, the EDs remained unclear if and how they would share the costs of One-to-One. Knowing their bandwidth and that their short-term priority was on launching Project Onramp, I chose not to add One-to-One to their cognitive load. This decision dovetails with Sutton's point to reduce cognitive load especially when organizational

complexity is at its limit (Sutton, 2014). In the winter of 2021, Life Science Cares commissioned a study to explore a national scale-up model; findings were released in February. As these conversations unfold, I anticipate greater clarity of what processes and resources could enable One-to-One to expand at each affiliate. These insights could factor into determining a scaling strategy after my residency.

Social Legitimacy. Social legitimacy in terms of having individual champions, formal or informal authorizations, and reputation all matter in creating public value (Moore, 1995; Heifetz et al., 2009). The founder of Life Science Cares who conceived of the idea behind One-to-One is a well-known and inspirational leader in the life sciences industry. My supervisor is also widely respected and a champion of my project. She brought me on to address the feasibility question—thereby conferring some formal authority in my role as well as ensuring capacity to do the work. Throughout my residency, I also exercised informal authority to recruit One-to-One partners and gain trust within my team. My strategy included building upon prior learnings, seeking out early wins, and making low-commitment asks in the beginning, all of which are examples of ways to exercise informal authority (Heifetz, 2009).

When it came to recruiting volunteers, my project benefited from the brand power of Life Science Cares and the life sciences industry. Life Science Cares Boston is backed by hundreds of stakeholders including life science firms, professional services companies, and foundations. The organization's Board of Directors are C-suite and senior executives who are recognized as thought leaders in the industry. Additionally, each affiliate has a separate Board of Advisors. These networks bring enormous credibility to the brand. Since the ask was relatively low-commitment, there were fewer questions or barriers that may have restricted the volunteers' ability to participate. I also benefited from the positive perception of Project Onramp among our corporate partners. Our corporate contacts viewed One-to-One as a natural extension of Project Onramp. Some stakeholders expressed that mentoring underserved college students aligned to their own DE&I initiatives.

Our student support partners were impressed by our track record of impact in the community and the social capital across the life sciences industry. However, for some, our brand and industry did not guarantee any ability to scale. One of our higher education partners was a department within a major four-year public university. This university serves a large population of students who identify as first-generation and low-income. My supervisor viewed this university and its peers as a channel to recruit students en masse that fit our target demographic. Early on, my supervisor was excited by the potential. With this particular institution, we could build a pathway to reach thousands of students. This was difficult to do in practice given the complex reality of scaling change in higher education. We built successful inroads into this specific department via a mutual connection. However, when we tried to explore avenues for expansion, their career services center was not responsive to our outreach even with warm introductions from our department contact. I suspected this was due to lack of capacity and competing priorities. In either case, having the support of the university was crucial since we did not have the bandwidth or expertise to recruit students ourselves. The challenge of expanding beyond this single department tempered our growth expectations for One-to-One. Although we exceeded our recruitment goals in the Fall round, we did not figure out how to achieve scale through a larger university. The need to generate more demand for One-to-One became more critical work over **clarifying One-to-One's scaling roadmap**. Output wise, this meant that our efforts had not yet produced a reliable model for university partnerships that Life Science Cares can replicate nationally.

Since I started my residency, Life Science Cares Boston has deepened its commitment in education beyond its traditional grant making work. Towards the end of my residency, the organization secured a large financial contribution for Project Onramp. Compass Collaborative is underway with its first pilot in March. Finally, a budget was approved for additional staffing and funding for One-to-One. Factors across public value proposition, operational feasibility, and social legitimacy greatly influenced my progress. Internal stakeholders wanted One-to-One to succeed which encouraged me throughout my residency. External stakeholders perceived One-to-One as high value which motivated their willingness to

help me **define the One-to-One model**. My team's culture and my skills enabled **an agile approach to program development** which gave me autonomy to make quick decisions to continuously improve the program. I leveraged the legitimacy of the Life Science Cares brand to mobilize volunteers and secure the necessary partnerships. Relying on these assets freed up my bandwidth to solve critical feasibility issues. **Providing evidence of how I resolved these issues** increased my supervisor's confidence in the program. At the same time, I had mixed progress **establishing clarity for senior stakeholders in One-to-One scaling roadmap** in Boston and nationally. This was largely due to challenges in recruiting students and capacity constraints across the non-Boston affiliates. The task of achieving feasibility compounded by the short duration of my residency did not leave me much time to explore creative ways to engage students. As I look at the outputs within my theory of action, I achieved my primary goal of building a scalable model for One-to-One that the Board of Directors committed to expanding.

V. Implications for Self

My experience at Life Science Cares taught me a lot about mobilizing and engaging diverse stakeholders. The core focus of our work as a team was to mobilize corporate action on poverty. Individually, we each leaned into our personal values, passion, and strengths to rally others. Below are two learnings that I plan to adopt into my own leadership practice.

1. When mobilizing others around passion issues, engage for their commitment, not buy-in.

The word "commitment" is used extensively at my organization. We ask for financial commitments from our corporate partners. We ask for time commitments from volunteers. We use commitment to describe an individuals' support on an issue or new initiative. This experience made me reflect on what commitment truly means. A commitment decision signals values alignment, trust, and focus. These elements drive action and accountability. During my residency, I observed my team members ask for commitment from a variety of stakeholders. During these pitches, I noticed there was often a clear articulation of our core

values and mission. This is not to say we did not seek buy-in. In practice, we were creating buy-in. However, creating buy-in was a byproduct of a more much powerful approach—leveraging the power of commitment to form enduring partnerships. Whereas buy-in conveys acceptance, commitment is about deep engagement. Reflecting on my residency, a lot of the work I did was about getting stakeholders to make commitments. Whether it involved building a relationship with a firm or a student, my work came down to asking individual people for their commitments one conversation at a time. I had no mandate or authority to require a course of action. While it was not difficult for stakeholders to understand the need to address the network gap issue, whether or not they would take action was a different story. Getting stakeholders to stay engaged during implementation required commitment, not buy-in.

In early meetings with firms and student support partners, I sought their commitment. I was direct with our partners by proactively communicating that our effort was a pilot and we wanted to improve the way we solve this equity issue. Their commitment required an effort to see my project through a lens of collective responsibility. It also required their emotional investment in learning and change. I acknowledged how difficult and uncertain the work is but tried to clarify our tactics to bring focus when possible. This idea of asking someone for their commitment to an action, particularly when that action could be inconvenient, was something I thought about a lot. I asked volunteers for patience as many were not contacted by students. I asked students to log their meetings, a task that can easily be forgotten. As I look back at my residency, I have come to appreciate the multiple aspects of seeking commitments from others—values alignment, trust, and focus. Being more conscious of the difference between commitment and buy-in has profoundly shifted the way I see my leadership. I want to apply the concept of commitment to how I mobilize and lead others through change. This means making a personal commitment to evolve my thinking from tactically seeking buy-in to more comprehensively seeking commitment.

2. Return to organizational core values and purpose when strategies diverge. I joined Life Science Cares at a time of rapid growth and expansion. Internal stakeholders saw the need to deepen existing engagements while amplifying their brand through more innovation. Since its founding, Life Science Cares has evolved quickly to meet its mission. Beyond what is already a unique model of infusing both social and financial capital into communities, Life Science Cares has added a whole portfolio of direct-service programs including One-to-One and Project Onramp. Naturally, I observed the organization also struggle at times to effectively communicate its value proposition. How can stakeholders easily understand the value that Life Science Cares creates considering its wide breadth of programs and strategies? The way my team and I have approached this question is through grounding our work in our core values and purpose. Despite the complexity across its programs, there is a singular mission to combat poverty and it is talked about often in team meetings. In my messaging of One-to-One to firms and student support partners, I have primarily positioned the network gap as an fundamental equity issue in our society, less as a shared value tactic for diversity recruitment. I have discovered that this framing resonates with stakeholders. As I began my residency, I was curious how a CSR entity like Life Science Cares would approach the idea of creating shared value (CSV). Will aspects of CSV appear in our strategy development work? How will this organization and its ecosystem wrestle with the friction between business and society? I noticed that the organization seemed less interested in integrating its initiatives with the financial objectives of its corporate partners. Instead the focus was on developing programs that affirm the organization's purpose and values. Whereas some activities contribute to the business results of its corporate partners, other programs exist without those outcomes in mind. For a young organization with diverse cross-sector constituents, the Life Science Cares Boston team is well aligned on its core values. This alignment is a throughline that explains why it is presently engaged in its core work as funder while designing for the future at the same time.

Experiencing Life Science Cares during this period of growth and reflection has helped me realize the importance of frequently articulating and engaging one's core values. During my residency, I

have observed many firms take the first step in naming their values and the next step of making public commitments particularly around DE&I. As I mentioned earlier, a commitment decision is not necessarily an easy step. It can be hard and inconvenient. However, when it is driven from a clarity of purpose and emotional tie to core values, taking action becomes the natural next step to engaging those core values. For my leadership moving forward, I intend to draw attention to core values in future strategy development conversations.

VI. Implications for Site

In this section, I share my recommendations for One-to-One moving forward. I also discuss why Life Science Cares should explicitly adopt an education strategy moving forward. As a resident, I was excited to learn that my work led my organization to see education and workforce development as an emerging focus area distinct from its grantmaking function. Through helping Life Science Cares address the network gap, I began to realize the implications of my work on the organization's broader commitment to education.

Recommendations for One-to-One

- **Tell a variety of stories that reach different segments of the student market.** We have data that shows students and volunteers enjoy and see the value of their meetings (See Appendix H). Based on self-reported data, we also observed that many students do not schedule meetings. This suggests that One-to-One's value proposition may not be compelling enough or there may be other factors at play. Leveraging student testimonials and reviews is an obvious social proof strategy. However, considering the diversity of colleges represented, academic majors, and lived experiences, One-to-One students may not immediately identify with the successes of their peers in the program. Since many students gravitated towards volunteers with similar life experiences or interests (evident from my interviews and conversion on our algorithm recommendations), this

desire for alignment can inform the channel and content for testimonial-driven marketing. This means we should perform more segmentation analysis to understand what types of students are helped in what ways. This will enable us to 1) tell a deeper story of each student persona and 2) diversify our messaging so that students can be inspired by similar peers and their experience of our volunteers. This work would tactically translate into personalized email and social media segmentation, potentially leading to more meetings being scheduled.

- **Continue to explore inroads to university faculty and academic deans.** My interviews revealed that faculty, family members, and friends were primary sources for students to seek out career and psychosocial help. Of the 19 students I interviewed, only two students mentioned going to their college career services center. This does not mean that we should avoid career services. On the contrary, we should be opportunistic at leveraging career services for connections to academic departments. If we can give career services a platform to provide value-add to curriculum objectives, then they may be willing to broker introductions that will diversify our recruitment channels. For example, one of our higher education partners requires all students to complete an internship before graduation. This objective is important to the academic deans as well as career services. Learning where these interests converge may also unlock new capacity and help bring clarity to a process for executing the work. For Project Onramp, we are defining this process with a local public four-year university. So far, a viable path entails career services advertising Project Onramp and faculty screening student resumes for demographic eligibility (faculty have expressed willingness to do so!). While this exact process differs from One-to-One, the strategies to seek interest convergence and identify faculty champions are transferable.
- **Connect One-to-One students to follow-on opportunities in the ecosystem.** One-to-One is an entry point to introduce many students to the life sciences industry. Being able to direct students to follow-on opportunities or assist volunteers to do so is part of the program's value proposition.

Other programs have emerged as high-touch next steps for students while they continue to network and build their awareness of the industry. In this industry's workforce ecosystem, players including LabCentral, MassBioEd, and the MA Life Sciences Center have developed initiatives that fill the gap between early career discovery and landing an internship or full-time job. Some programs require more time commitment while others organize one-off events like virtual career panels or company visits. As these initiatives expand on their own, Life Science Cares can facilitate discussion to explore how we can steer these efforts to work in mutually reinforcing ways. One output from these conversations may be student-facing collateral to illustrate a sequential pathway to enter this industry and opportunities to upskill and network along the way. Independently, we should develop guidance for One-to-One volunteers to refer students to internships or recommend them for us to monitor. In the short term, the latter may mean a greater lift on our end to track and make customized connections. So far, I have recommended eligible students to participate in follow-on programs resulting in one student accepting a full-time job offer.

- **Implement cohort analysis to measure and track impact.** Networking is not a one-time occurrence. From a momentum building and fundraising lens, we have a lot to gain in understanding the benefits of consistent networking. Currently, our effectiveness at capturing feedback depends on student self-reporting. Getting a subset of students to commit to cadence of meetings can allow us to measure impact over time across demographic or behavioral traits. On a demographic level, almost a third of students reported never having met an industry professional before One-to-One (See Appendix D). For these students, reaching out to an adult in a position of power who is not a family member or a past teacher can be a daunting task. If a cohort was selected from this segment of students, one potential research angle is whether these meetings increase students' confidence to pursue networking on their own. A behavioral cohort can allow us to explore the effects of meeting frequency or conversation topic on their confidence to

network and changes in the composition of their network. We can even compare these outcomes between students assigned a volunteer match with students who can choose who they meet (See Appendix O). Financial incentives or scholarships are effective ways to recruit participants. Concurrently, we can continue to gather feedback from volunteers.

Life Science Cares has the opportunity to define an explicit strategy in education

During my residency, I consulted on different education-related projects. I observed that these projects were scaling at different speeds and along different dimensions. As these projects expand, resources may gradually flow in that direction, potentially shifting the organization's focus away from its broader mission. Establishing an integrated strategy that links education, workforce, and poverty can ensure that project-level objectives remain traceable to broader mission outcomes. There is some interest internally to define a broader strategy in education. Below I discuss what Life Science Cares could gain by doing so and the risks associated with the status quo.

- **Opportunities to gain from defining an education strategy**

- *Filter for decision-making in pursuing education-related work.* As a CSR entity, Life Science Cares responds to the constantly evolving needs of diverse cross-sector stakeholders. There is also internal pressure from the Board of Directors to push out innovative brand-amplifying programs. For such a small team with a broad base of constituents, being willing to say no to certain growth objectives and justifying the rationale are equally important capabilities. So far, the de facto education strategy is the aggregation of different programs scaling each in their own direction. As a consequence, when programs like One-to-One show promise for scale, the appetite for growth can overpower the need for focus. Formalizing a strategy in education does not mean giving license to pursue new education projects. Instead, it is about incorporating a strategic focus in the organization's decision making process. This strategy should be niche enough

to prevent efforts from being spread too thin.

- *Get stakeholder commitment for resources to do the work.* In the past, achieving high impact with low overhead was a source of pride among internal funders and to some extent, was even viewed as a competitive edge. This perception is shifting. Driven by new programs and the national scale-up conversation, key stakeholders have begun to see the organization as a program operator. This shift suggests a greater need to coordinate resource allocation and synchronize outcomes across multiple projects. The organization's commitment to three distinct education-related programs—One-to-One, Project Onramp, and Compass Collaborative—is an opportunity to align resource decisions with this new perception. Getting support from the Board of Directors for additional resources is a balancing act of patience and urgency. Strategy development work can be a low-risk approach to learning what outcomes stakeholders care about and where their sensitivities lie.
- *Reduce complexity in the value proposition.* One of the priorities for 2022 from the Board of Directors is to improve our brand awareness so that external stakeholders can clearly understand our mission, model, and impact. Contextualizing our education-related programs in a broader education strategy can help the organization simplify its pitch resulting in greater clarity of the value proposition. Life Science Cares' model is complex. It features a diversity of programs and has a dual orientation towards trust-based philanthropy and shared value creation. When faced with a complex model, grouping discrete projects to a higher-order strategy could help the audience understand what verticals the organization operates in. An education strategy that groups all of our education-related projects can be an input in an organization-level theory of action. This theory of action can help Life Science Cares steward more mature corporate partners towards strategic meaningful engagement versus opportunities a la carte.

- **Risks of not defining an education strategy**

- *Dilution of the Life Science Cares parent brand.* Without a public-facing education strategy, our education-related projects may get viewed as independent initiatives which could dilute the organization's overall brand power. For example, Life Science Cares is mentioned once on the Project Onramp homepage without any reference to what Life Science Cares does. Some of the One-to-One volunteers I interviewed knew more about Project Onramp than Life Science Cares. While each project serves a different value proposition, they have limited potential to enrich the Life Science Cares parent brand. As these branded initiatives get scaled and possibly accumulate brand equity of its own, the risk of image confusion over the Life Science Cares parent brand becomes more pronounced.
- *Competitive risks.* The life sciences industry is tightly connected. There are several program operators with expertise in workforce development. With these players, we have more to gain through collaboration than direct competition. However, if they do not understand our intentions and niche in this space, they may get concerned about duplication of efforts or become protective of their connections. They may expect resources to flow in their direction if we are not deliberate about our commitment in education. This risk is a concern as we have attracted significant attention from funders for Project Onramp despite being a relatively young organization.
- *Reduced interest from big donors.* The funders for Project Onramp are likely to be the same for One-to-One. Big name donors may seek to deepen their impact beyond internship placement. These donors may expect an explicit focus on education that is also expansive in its vision and integrated in its approach.

VII. Implications for Sector

Implications on Building Social Capital

The importance of similarities. My project raised the question of how students determine who to contact. Some students were open to learning and had a strong orientation towards general career development. These students were less selective on who to meet. Other students looked for shared lived experiences with the volunteers. When brokering these new connections, increasing the perception of relatability can help plant trust early on. I interviewed a One-to-One student who was particularly self-conscious of her English abilities (this student was fluent in conversation with me!). She found someone who was also a first-generation immigrant and her first meeting turned into monthly mentorship calls. Beyond searching for demographic similarities, students also looked for shared vulnerabilities (e.g., anxiety or mental health). Future research can explore effective ways of framing volunteer backgrounds so their stories can resonate with students. This also means exploring technology platforms that allow volunteers to create engaging profiles.

Solving the network gap issue is iterative, not necessarily incremental. One-to-One has shown that there was no typical networking approach. Some students prefer to search for connections while others rely on our recommendations. Some students have a narrow search criteria while others are open to who they meet. These user behaviors affect the fundamental architecture of any networking program and the technologies used. Delivering a single feature can greatly limit the usability for everyone else. This is not to suggest we roll out complex products at once or ignore bandwidth constraints. Rather, as we build new solutions in this space, we should focus on improving outcomes, not refining features at the expense of iteration. In my interviews, I learned that students were interested in lab tours (including virtual) and volunteers wanted to reach more students at once. Although these opportunities deviate from the One-to-One model, they may accelerate networking behavior without incurring major time and costs. Thus, as we refine the core model, we should simultaneously explore other opportunities that can be a

force multiplier for networking.

The use of technology to help students measure and track social capital. Technology can help students visualize their progress along different dimensions of social capital. As a baseline, One-to-One students can see all of their logged meetings with volunteers and recommendations for new matches. More support can be integrated to help students maintain those relationships. Automated reminders can help students check-in with people they have met. More complex capabilities can allow students to capture what they are learning and build upon their knowledge in subsequent meetings. Across my market research, I did not see a single solution that performs all of these functions. Whether a one-size-fits-all solution should exist is a question of student demand more than feasibility.

Students should feel that they can mobilize their new connections, not just know that access is there. A common question I got from students was whether or not the volunteers have to respond when students reach out. Learning that the volunteers opted into One-to-One and made commitments to help came as a surprise to students. This insight not only helped offset their concerns but also increased their confidence. Some students were amazed when I shared that some meetings led to lab visits and internship referrals. When brokering new connections, it is important to reinforce the perception of trust and community. If students believe the industry professionals are willing to act on their behalf, then their anxieties may be greatly reduced.

Implications on Higher Education

Career services as a relationship broker. For employers or external partners, the career services center is the primary point of contact. In my interviews, students rarely mentioned career services as a resource. Students default to their trusted network that includes faculty, family, and friends for career opportunities. One student said the prevailing attitude at his college was “if you want an internship, you just email a bunch of professors and if they don’t respond, try more” (See Appendix A). This is an

opportunity for career services to bring transformative impact. For example, they can extend their services to campus partners (e.g., faculty, advisors, supervisors) who interact frequently with students. The faculty involved in One-to-One are supportive of networking activities and career outcomes of their students. This was evident in several faculty conversations I had related to advertising One-to-One. However, faculty may not have the bandwidth to continuously build connections with industry. Career services staff can source employer connections and provide those contacts to faculty to review and push out to students. These efforts can remain branded through career services to add legitimacy and increase student awareness of their career services. Through my project, I have collaborated with career services staff from three higher education partners. They are each at different stages of working with faculty to infuse their objectives or programming directly into the curriculum. These efforts are promising. If career services can establish their presence as an ecosystem rather than a physical space, their impact can spread to more students, potentially leading to better outcomes.

Implications on the Life Sciences Industry

Closing the network gap can bring strategic value beyond talent diversification. One-to-One's appeal to firms is primarily cause-driven. The primary aim is to close the network gap faced by underserved students, not become an employee-referral program—although internship referrals can occur organically. One volunteer even mentioned that she prefers this student-first approach because it removes any evaluative pressure that the volunteer or student may feel. There are psychological benefits of mentoring for volunteers regardless of whether students want to pursue a life sciences career. More research is needed to understand how frequent meetings with different students affect volunteer-level benefits and translate into business value for firms. One-to-One's approach requires volunteers to be open to talking with multiple students individually as opposed to being assigned a single mentee. Considering the massive demand from volunteers to participate in One-to-One, such research may also surface trends that connect a volunteer's desire for social action to certain leadership qualities that firms can leverage for other efforts.

The need for a unified brand positioning strategy across the education landscape. There is extensive data on the economic growth of the life sciences industry, demand for talent, and high earning potential (although salary varies greatly depending on the position). How well do these economic motivations resonate with underserved students of color? According to a recent Gallup poll (2021) on industry perceptions, the pharmaceutical industry had the second highest percentage of negative perception across 25 different sectors. One-to-One is a branding opportunity for a specific audience. These students are also shaped by the interests of their peers. To engage this population, the industry needs to define what brand associations they hope to create in the minds of students. Then firms could collaborate on awareness campaigns that reach across the K-12 and higher education landscape. This means pooling resources to craft content that speaks to all students and selecting the appropriate social media platforms to reach them. During one of our Project Onramp strategy calls, one HR director shared that students tend to have narrow perceptions of what engaging work could look like in the sector. The industry is also aware that its current workforce does not reflect the racial diversity of the students they are trying to recruit. This is evident when comparing the racial diversity of One-to-One students with the volunteers. Some firms pursue independent efforts to expose students to their work and employees. However, these projects lack reach and can turn competitive as some firms have more resources than others. What low-lift actions can the industry take as a whole to attract students to the life sciences on an ongoing basis? As a starting point, the industry should survey students to understand their perceptions of the industry and what proof points students want to see to increase their interest.

The industry should see Life Science Cares as a catalyst, not the limit. The majority of life science companies in Massachusetts are early stage companies without defined CSR missions. Limited resources and unfamiliarity with CSR implementation constrain their ability to fully benefit from the value of their CSR work. Even with the support of Life Science Cares, efforts often depend on a single internal champion within firms. If that person loses interest or leaves the firm, the opportunity to institutionalize change can disappear or need to restart with someone new to the role. Life Science Cares

can bring capacity but therein lies the tension. The industry outsources its CSR work to Life Science Cares. To what extent should more mature firms be accountable to scaling their CSR activities beyond the mission, scope, and capacity of Life Science Cares? When possible, firms should share the workload of building the CSR ecosystem so that Life Science Cares can more effectively generate network effects that benefit everyone. As I tried to demonstrate through my strategic project, corporate mentoring can be a low-lift, high-impact way to close the network gap. Platform businesses like Life Science Cares are well positioned to organize these activities. However, meetings can quickly lead to deeper engagements like company visits or job shadows which require bigger commitments from firms. It is not realistic to expect all firms to make those commitments and share learnings broadly. As ideas are piloted and scaled, the industry can benefit from a subset of companies serving as executors, thought leaders, and benchmarks for the entire sector. Life Science Cares can help direct this effort. However, this work requires a willingness from the industry to see Life Science Cares as one tool, not an end point to its CSR commitments.

Cross-sector Implications

Solving complex long-term challenges should include recognizing low-lift, high-potential opportunities in the short term. My strategic project reduced uncertainty by focusing on a single task of improving program feasibility. Doing so meant significantly simplifying the program both operationally and in our messaging. This is not to say I was unaware of the complexity of the network gap issue or that I expected our approach to be sufficiently comprehensive. Instead, I saw my work as identifying a high-potential opportunity for Life Science Cares to meet its social mission and then field testing our entry. One-to-One's ask for students, volunteers, and partners was intentionally designed to be simple and achievable. By making One-to-One low-lift, we secured adequate early adoption, allowing us to see promise in the program and then build upon our learnings. Over time, the program can pick up additional momentum and snowball into impact across the industry and the education sector.

Formal education systems may benefit from seeking out low-lift solutions that allow for fast-cycle learning instead of often going after the most complex problem at once with plans comprising enormous scope and too many metrics. Considering the dynamic environment of education reform, some of these long-term goals may turn obsolete before the timescale is even reached. Therefore, remaining agile to low-lift opportunities in the short term is important to keeping stakeholders engaged and moving forward over the stretch.

VIII. Conclusion

I began my residency hoping to explore creative solutions to the network gap issue. I focused on corporate mentoring as a promising strategy to bring social capital into underserved communities. Coming into Life Science Cares, I was motivated to help the life sciences industry leverage its capabilities in tackling the network gap. I was fortunate to arrive in an organization that recognized the need to proactively address this issue from the industry side. This recognition led to the creation of One-to-One, a networking program designed to help underserved college students access and mobilize social capital embedded in the life sciences industry. In 2020, this program was piloted for the first time. I stepped into Life Science Cares in 2021 as a resident seeking to accomplish two goals: 1) improve the feasibility of the One-to-One program so that this program can be sustained and 2) contribute knowledge on how best to scale the program for our Life Science Cares Boston affiliate and nationally across the other affiliates.

Ultimately, I was successful at achieving my first goal. My supervisor, the President of Life Science Cares Boston and the Life Science Cares Board of Directors moved to expand this program with additional funding and resources. My work helped this program achieve feasibility and demonstrated how firms can make a significant impact on students' lives in a low-lift way. My work also confirmed the enormous demand among volunteers in the life sciences industry to engage in public education. In a way, my project has just scratched the surface of how the private sector can pursue mentoring programs at

scale. My excitement is shared within the team at Life Sciences Cares and numerous corporate partners, nonprofits, and higher education institutions. As with any scaling initiative, the path to scale begins with defining the “it” that is to be scaled. While that answer is clear at Life Science Cares Boston—evidenced by leadership’s decision to expand this program—I had limited success determining our scaling strategy nationally. This was largely due to capacity issues across the broader organization and the limited duration of my residency to influence those dynamics. However, my work has now opened the conversation for determining a timeline and resource needs for a national expansion of One-to-One.

My work has laid a strong foundation for Life Science Cares and the life sciences industry to think about how to support students more directly through low-lift, high-impact networking. How I have evolved the One-to-One program serves as a proof-of-concept that other industry sectors can build upon as they seek to enter education or deepen their existing impact in the field. In the meantime, I am hopeful that Life Science Cares and the life sciences industry will continue to explore more ways to tackle the network gap experienced by so many underserved students in this country.

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APPENDIX A.

STUDENT INTERVIEWS

These students quotes are synthesized from 19 semi-structured interviews I conducted between July and February. I organized these quotes according to topics that emerged from my questions.

Topics	Theme	Samples of Coded Text
Short and long-term goals	Diverse plans after graduation	• "I want to go to medical school." • "I'm looking at MPH and PhD programs right now. A third one is being at a company and doing research." • "I want to find a job after I graduate. My friends are trying to apply for a job. They are saying it's so hard to get it. And it makes me so worried about it. I don't know how to look for a job or make a connection."
	Soft-Skills	• "I want to get better at public speaking. Another one is developing better interview skills and networking." • "I'm an introvert. I want to just improve my confidence and meet new people and find mentors." • "Generally communication and get better at networking."
Current barriers to reaching goals	Not enough relevant connections or how to network	• "Not having the right connections at the right time. I think a lot of opportunities arise because you know the right people or you apply for something at the right time. It might not be me reaching out enough or me not allocating enough time to make those connections. I think time and effort are also the barriers." • "I feel like I have nobody to talk to. What do I need to do right now to prepare? Resume, cover letter, finding someone to write a letter of reference for me or telling me what I should do." • "I hear a lot about networking, I'm still unsure of how all of that works. I have my network of people in this field that I talk to. They can recommend me. Is that good enough or do I talk to people I don't even know? I have a LinkedIn. Just never used it. If you want an internship, you just email a bunch of professors and if they don't respond, try more." • "When it comes to getting to know me on a deeper level, I can't really relate to my professors. Most of them don't look like me. They don't genuinely understand where I come from. They just know I'm another high-achieving student."
	Lack of experience and/or skills	• "I feel like I lack experience in the lab. Most of my classes were online because of the pandemic." • "My biggest concern is how do I get into medical school. You have to go through a long process to make sure you have good grades and skills. You need to do good on your interviews." • "I am worried about English. English is my second language. I worry that people will turn me down because of my language skills."
	Attitudinal factors	• "Taking risks. I like when things are planned out. It's hard to take risks when I've planned for certain things." • "I'm afraid that people won't give me the chance to show what I can do because they don't want to take their chance with me."
Types of help that is missing	Job shadows	• "One thing I'm trying to do is find opportunities to shadow a position. I want to have a close experience in the clinic. I'm currently contacting people to see if they would be willing to let me shadow them." • "In terms of experiences, I'm aiming for a summer internship in a research lab."
	More networking	• "More networking. Networking can broaden my perspective in biology. For example, maybe I can go into cancer research or pharmaceutical research. It can just help me determine what path to do. Is this something I want to do?" • "I think I would like more mentoring. A lot of the research opportunities ask for experience. But getting to that point is hard to do. It's competitive. I think mentoring can help build some experience. You can learn a specific skill from that one person." • "I don't think I can ask my professor. They are so busy. I don't want to bother them. I'd like to meet with new people." • "While I have some people I can rely on, their knowledge is limited. If I wanted to talk to someone in computer science, my mentors don't know anything about that." • "I don't have anyone in my network that is doing epidemiology. I think just meeting people who had my major." • "I'm interested in data analytics. I would love to meet people to understand what paths to get to where they are. I got interested in this field late and our school doesn't provide a lot of support in those areas."
Metrics of success in a networking call	Gain new knowledge	• "When all my questions are answered and I can learn new things. For example, if I don't know where to find a job, the professional can tell me and encourage me." • "If I feel like I learned something valuable and want to keep that connection. They can help me with goal setting."
	Engagement	• "I get to ask a lot of questions and they give me the chance to ask them back. It's not just a one-way conversation." • "A first conversation should give you good vibes. If both parties are able to converse in a comfortable manner, further conversation and advice will grow from that. I think you will need to spend more time trying to get comfortable rather than jump into the advice and mentoring." • "To get to know each other better in the first meeting like personal background. If we just talked about advising, then we don't really know each other."
Perceived value of One-to-One	Gain new knowledge in certain industries or explore broadly	• "Looking at the industry leaders and really just choosing someone who works in a field that I'm interested in. The possibilities are endless. Instead of just asking mentors on their knowledge, I can branch out." • "I am not just interested in data science. I also like UI/UX and product design. I haven't been exposed to that on a higher level. I would love to hear from people in the professional world what they are working on." • "I like to network with as many people as possible. As a business student, this is just what we do. I organize a lot of events to get people to network. I like learning how they got to where they are. They don't have to be in business but they can help me see explore what's out there." • "Because I'm able to know what industry they are in, that's a huge first step in narrowing down a wide range of people I can include in my network."

APPENDIX B.

VOLUNTEER INTERVIEWS

These volunteer quotes are synthesized from 6 semi-structured interviews I conducted between July and February. I organized these quotes according to topics that emerged from my questions.

Topics	Theme	Samples of Coded Text
Motivation	Enjoyment	• "I've done mentoring before. I enjoy it. Most of them are young and they don't know what to do. If I can give them advice early, then that's beneficial." • "I used to be a high school teacher. I was proud of that time. This was many years ago but they went to college and would come back to say I'm so grateful. It was a great satisfaction."
	Altruistic factors	• "I know the importance of mentorship. I've been fortunate with relationships growing and even now that have accelerated my career. I just think it's important to provide that guidance to students." • "I have many struggles in the past. I was not informed. I went through a system that said if you didn't have the grades, say good bye and you don't have a future. I don't want any student to go through that." • "There is a large gap between what I do. Kids can't visualize what I do. If there is an opportunity to help young explore that, then I'm motivated to do that." • "Students say that I'll do all this stuff now and when I'm a doctor, I'll start living. Of course you have to plan ahead but they shouldn't compromise on the now."
	Capacity to do	• "It needed to be something I could see the impact. I think these calls are easy to schedule on Zoom. When I plan ahead, I can allocate the time for it."
Perception of the problem	Lack of career awareness	• "When I was going into STEM, it was to be a doctor or get a PhD. For me, if I had gone through with medical school, I would struggle to get to my passion. Now I'm working on important gene therapy and I get to do other things. It's okay to be unique than trying to fit into a job description." • "Students are not in line of sight of industry. They spend most of their time with professors and they are not in a position to consider industry."
	Financial barriers	• "SES is huge barrier. It's so expensive. When you're young, you don't know if you keep doing it." • "Students with financial difficulties can't afford the cost of school. Especially in our profession where many people hold advanced degrees, it can just put off this entire industry for those students."
Metrics of success in a networking Call	Student is prepared	• "Coming prepared with any questions about career path, choices, and decisions they've made." • "Come with a discussion topic in mind or a concern so we can focus on the conversation and have enough time for a productive meeting."
	Providing help	• "Being able to help students think strategically about their goals and create action items." • "Get to know them personally and be curious and have an open mind." • "The student feels comfortable with me and is not afraid to ask questions and be honest." • "That I am a good listener. I wait and hear what they want to say and understand." • "Giving them the tools they need. I want to help them see that there are many ways to enter STEM."
	Follow-up	• "Being able to guide the students down the scientific path and towards internships. Maybe we can connect them with an internship later on." • "It would make sense if you could tie One-to-One and Project Onramp together. It's just the next step for the students. If it's the path you are interested in, you can make the internship happen." • "Connecting with them on LinkedIn and checking in every once in a while."
Opportunity in the life sciences	Business opportunity	• "We are the fastest growing industry here. We need the next generation of students to look at us and see the possibilities." • "The number of pharmaceutical companies that are here, there is a need for professionals all the time and not necessarily those with a lot of years of experience. There are many entry level positions. This is a benefit because I can help students see their path in this industry."
	Culture/Values	• "It's in our culture. There is demand for volunteer engagement. It's not just the money. The culture is in place and we have an obligation. We live and work in Cambridge. We make a lot of money. We want to give back and need a plan." • "Throughout the years, there is this mantra that the younger generation has all the power. I think mentorship is a healthy way to help each successive generation that's not focused on specific goals or metrics. Even if a mentee doesn't go into the industry, someone else's mentee might. At scale, this benefits the community."

APPENDIX C.

PRIORITIZATION MATRIX FOR FALL LAUNCH

This graphic shows features to be developed to improve feasibility for One-to-One. This prioritization emerged from insights I gathered during the fall from talking with students, volunteers, partners, and my team.

Must Have

Non-negotiable product features that necessary

- Provide students access to entire One-to-One volunteer database.
- Capture career and personal information from students and volunteers.
- Automate the matching process.
- Track meeting activity for each student.

Should Have

Important features that are not vital but add significant value

- Reduce unnecessary barriers to student/volunteer sign up process.
- Automate email reminders based on usage.
- Ability to disaggregate usage data at the admin level.
- Automated feedback forms

Could Have

Nice to have features but their value remains uncertain

- Provide a unique admin view for student support and corporate partners.
- Allow students to customize their own matching criteria.

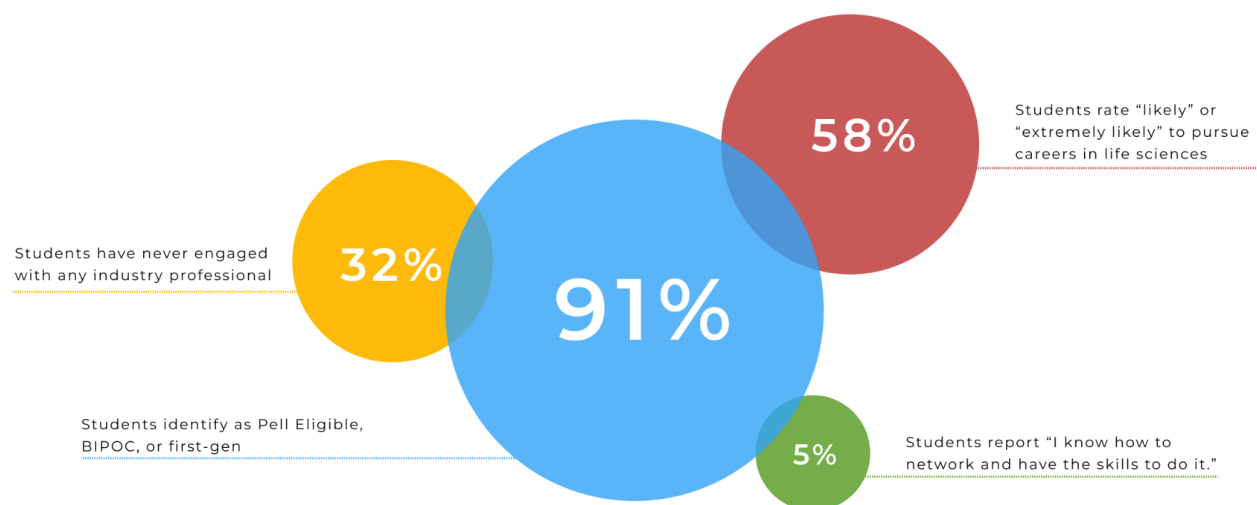
Won't Have

Features that are not a priority at this specific time frame

- In-app messaging between students and volunteers.
- Update matches in real time as users sign-up.
- Allow students to customize their own matching criteria.

APPENDIX D. DEMOGRAPHIC SURVEY

Data is from an October survey. Students were asked to complete this before starting One-to-One (n=78).



APPENDIX E.

TYPES OF HELP

This table compares the types of help that students sought with what volunteers could offer. This data was extracted from student and volunteer profile data (Students = 116, Volunteers = 74). Unit of comparison is the % of tags. This percentage is calculated by dividing the number of times each tag appears by the total number of tags selected by students or volunteers. Data was pulled in January.

What students say they like help with by % of tags selected (Ranked)

18%	Career exploration & planning
15%	Networking
10%	Interview skills
8%	Virtual workplace tours/job shadows
8%	Leadership
7%	Financial Planning
7%	Goal setting
6%	Communication
5%	Academic learning
4%	Stress management
4%	Negotiation
3%	Conflicts/difficult conversations
3%	Mental Wellness
2%	Giving and receiving feedback
<1%	Managing family/home issues

What volunteers say they can help with by % of tags selected (Ranked)

22%	Career exploration & planning
14%	Interview skills
9%	Goal setting
9%	Communication
8%	Academic learning
7%	Leadership
7%	Networking
5%	Giving and receiving feedback
4%	Stress Management
3%	Mental Wellness
3%	Conflicts/difficult conversations
3%	Managing family/home issues
3%	Negotiation
2%	Financial planning
1%	Virtual workplace tours/job shadows

APPENDIX F.

TOPICS OF INTEREST

This table compares the topics that students were interested in with topics that volunteer said are important in their jobs. This data was extracted from student and volunteer profile data (Students = 116, Volunteers = 74). Unit of comparison is the % of tags. This percentage is calculated by dividing the number of times each tag appears by the total number of tags selected by students or volunteers. Data was pulled in January.

Topics that students are interested in by % of tags selected (Ranked)

8%	Health
8%	Culture
7%	Biology
7%	Entrepreneurship
7%	Psychology
6%	Technology
5%	Food
5%	Social systems
4%	Design
4%	Chemistry
4%	Artificial intelligence
4%	Environment
4%	Entertainment
3%	Data
3%	Animals
3%	Politics
3%	History
3%	Space
2%	Math
2%	Energy
2%	Cities
2%	Plants
1%	Evolution
1%	Engineering
1%	Transportation
1%	Oceans
1%	Geology
1%	Physics
<1%	Materials

Topics that volunteers say are important to their job by % of tags selected (Ranked)

21%	Biology
15%	Health
12%	Data
11%	Chemistry
11%	Technology
9%	Business
4%	Engineering
3%	Culture
3%	Math
2%	Psychology
2%	Design
2%	Animals
1%	Evolution
1%	Cities
1%	Materials
1%	Social systems
1%	Environment
0%	Physics
0%	Politics
0%	Plants
0%	Oceans
0%	Geology
0%	Energy
0%	Space
0%	Food
0%	Entertainment
0%	Transportation
0%	History
0%	Artificial intelligence

APPENDIX G.

IDENTITIES/EXPERIENCES

This table compares the identities/experiences that students wanted volunteers to be able to relate to with what volunteers said they can relate to. This data was extracted from student and volunteer profile data (Students = 116, Volunteers = 74). Unit of comparison is the # of tags. This value aggregates the number of times students or volunteers selected that specific tag across all the profiles. This question was optional in the profile. Data was pulled in January.

Identities/experiences that students like their match to be able to relate to by # of tags selected (Ranked)

48	First in family to go to college
43	Woman
35	Perfectionism/fear of failure/performance anxiety
35	Family pressures or expectations
33	Black
31	Immigrant
23	Lack of financial resources
20	Mental health challenges
13	Low grades in school
12	Latina/o/x/e
10	East Asian
9	South Asian
9	Non-native English speaker
8	Chronic pain or illness
6	Lack of community support
6	Personal or familial experience with the justice system
5	White
5	Man
4	Learning disability
3	Marginalized sexuality
2	Indigenous
2	Pacific Islander
1	Middle Eastern
1	Nonbinary
1	Transgender
1	Agender
1	Rural upbringing
1	Grew up in foster care
1	Deaf or hard of hearing
1	Neurodivergent

Identities/experiences that volunteers said they can relate to by # of tags selected (Ranked)

33	Woman
30	Perfectionism/fear of failure/performance anxiety
28	Family pressures or expectations
18	White
18	First in family to go to college
16	Immigrant
14	Lack of financial resources
11	Black
11	Mental health challenges
10	Man
8	Latina/o/x/e
8	Chronic pain or illness
7	Low grades in school
7	Non-native English speaker
5	Rural upbringing
4	South Asian
3	East Asian
3	Lack of community support
2	Marginalized sexuality
1	Middle Eastern
1	Deaf or hard of hearing
1	Personal or familial experience with the justice system
0	Indigenous
0	Pacific Islander
0	Nonbinary
0	Transgender
0	Agender
0	Grew up in foster care
0	Learning disability
0	Neurodivergent

APPENDIX H.

POST-MEETING FEEDBACK FROM FALL IMPLEMENTATION (MODEL A)

These quotes are collected from semi-structured interviews with 6 students and 4 volunteers who completed meetings during our fall implementation (Model A). This feedback does not reflect Model B during which we tested a new tool that automatically sent calendar invites for matches between students and volunteers.

	 Strengths	 Challenges and Drawbacks
Students	Positive impact on career guidance "She not only cared about helping me on the academic side and looking for opportunities but also gave me advice to have clearer ideas about what I was looking for and made me rethink twice many decisions which I thought I had already decided, see them in another way." Feeling encouraged "Talking to him gave me hope to see myself become successful in the future. I was able to relate to his story and background, and I connected with him the moment he started talking about my neighborhood. Our conversation guided me to think of myself as unstoppable, strong, and courageous. He advised me that having a goal in mind, no matter how big or small, I can achieve it if I stay determined and motivated to fight whatever obstacles come my way." Meeting felt engaging "The conversation wasn't robotic. It was a smooth conversation. Casual talk leading from introductions to going more in-depth into questions I had. I had a list of questions prepared." Interest in careers in the life sciences "I definitely feel like I'm more interested in this field. This motivates me to try shadowing people. So I reached out to them to see if that was possible." "I was never really into industry. I always thought I was going to do academia but touring the lab for sure got my mind thinking! To see that the work and research conducted in the biotech lab directly impacted people's lives in a positive way was really cool. I of course would want to be someone who helps others. I have never seen such advanced technology before so that was also quite fascinating." Ease of use of the technology "I like the website. It's easy to log in. I like the colors." "I did look at the matches but wanted to look at the database. I don't think it's bad because there will be people who come up as helpful. I think it's a good idea if you don't know how to start."	More filters to search for professionals "More filters by geography and profession. Some people come into the program looking for specific people. I was hoping to connect with medical doctors in Boston when I signed up." The need for more responsive design "It would be helpful if you click on the person's profile, you can read all their information. The rectangle and words were too small." "Browsing the profile was weird. Since all of the profiles have different lengths, it starts to get confusing. If I'm reading one profile, I have to scroll up and see who it is. The font for the matches with the names is small. If people have glasses or hard time seeing, it'll be hard for them." "I do wish I could access the website on my mobile device (iPhone). It seems that it only works properly on desktop." More compelling design of the matching section in the portal "Just to be able to see how those matches were made." "I didn't see that section. I looked at the table below." "I saw the matches. I read their profiles but just kept looking below at the other professionals. It just piqued my interest." Not sure how to plan next steps "I just felt this conversation was a one time occurrence. There were no next steps discussed so I felt this meeting may be a one and done type of situation." The need for more training, resources, or follow-on support "I would like to attend more training. Just see what other students' experiences are." "If there was more information about internships and jobs. I have to do an internship. It'd be great if this can help with that."
Volunteers	Students came prepared "They asked a lot of questions. Definitely came prepared and took notes." "Everything went smoothly. She was really engaged into the conversation and came with questions." "She had questions prepared so she facilitated the interaction." "He was mature. Had a lot of exploratory questions. I didn't feel he was doing this to check a box. He was appreciative of the opportunity." The meetings seemed impactful "I answered all the questions they had for me. I have experienced the struggles they went through. This gave me an idea of the situation. When I went to college, I had a lot of questions and uncertainties." "I was able to answer her questions. I wanted to help her see a different perspective. That things aren't always black and white and that there is a lot of grey in the professional workplace." "It was noticeable that students were feeling more empowered. They have new ideas and plans." "I helped him see the idea of focusing on passion and ideals instead of working towards a job description. He never thought about it like that before." Positive next steps from the meeting "She asked me if we have an internships available. I told her my summer was open. I'd like to have her. I need to clear it with the company." "We didn't have any next steps but I left the line open if we needed to. I would definitely talk to him again. I felt he had a similar experience as me. I just felt surreal to be contacted. I was like him years ago and now I get to be in this role. It made me happy." Ease of use with the technology "The portal was easy for me. Once I got the email, I went back to read his profile. You can also see different topic areas that he was interested in. You made it really easy to input our bios." "The communication was clear from my manager."	Challenges encountered during the meeting "I'm afraid that I'm not a counselor, not a psychologist, just a person who wants to help based on previous experience. But sometimes, I'm afraid that something will not go in the way they expect because they went into a path I told them. So I try not to tell them you should do this or that." "I felt I was talking a lot more. I wish there was more back and forth. Maybe it's Zoom or just their personality being shy." "Maybe the student could mention at the beginning of the meeting if they have another meeting back to back so that we can make sure to make time and talk about future steps." Lack of time to engaging with the tools and providing feedback "I don't recall going anywhere to log in. Sometimes I am more or less overwhelmed on a daily basis. I don't do everything the program asks but I respond to students." "I didn't even know I could do that. Had I known that, I would have signed into the portal and read their profile. I think with the demands of being a professional, I just didn't have time to go in and investigate the portal." Would like additional training "I have to look at other sources of information to help me be successful. It would help if on a regular basis, I received an email with information on how I could do a better job." "It doesn't have to be a meeting but just paper and literature that I can read." Additional ideas to expand the program "With panels, you can reach a broader audience but in a one-on-one setting, I can be more vulnerable. I think there should be ways we can balance both." "It would make sense of One-to-One and Project Onramp can be tied together. It's just the next step for students. You talk about our career. If it's in the path they are interested in, you can make an internship happen." "I would like to participate more in the education side. Some of these things occur in normal business hours so that's difficult."

APPENDIX I.

USAGE DATA (MODEL A)

In Model A, students initiated email outreach to volunteers to schedule their one-on-one meetings. Students had access to the entire database of volunteers along with 3 recommendations. Table 1 shows general usage data during our fall implementation between October 18th and January 31st (Model A). Table 2 shows the cumulative % of students who scheduled at least 1 meeting. Table 3 shows the # of unique meetings scheduled to occur in each month. All data are self-reported by students in the One-to-One portal I developed. Data was pulled on 1.26.22.

Table 1

63 # of students who have activated their accounts in the One-to-One portal (116 total students signed up).	61 # of volunteers who have activated their accounts in the One-to-One portal (74 total volunteers signed up).	34 Total # of unique meetings that have been scheduled.	29% % of scheduled meetings between students and a volunteer within their top 3 recommendations.
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Table 2

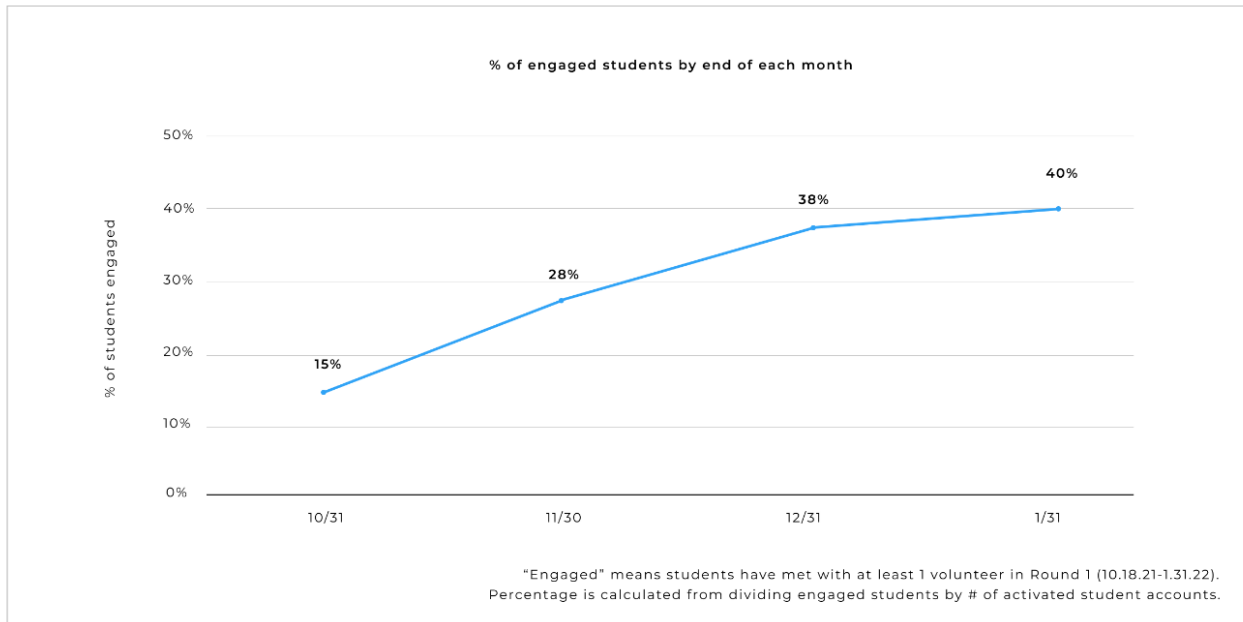
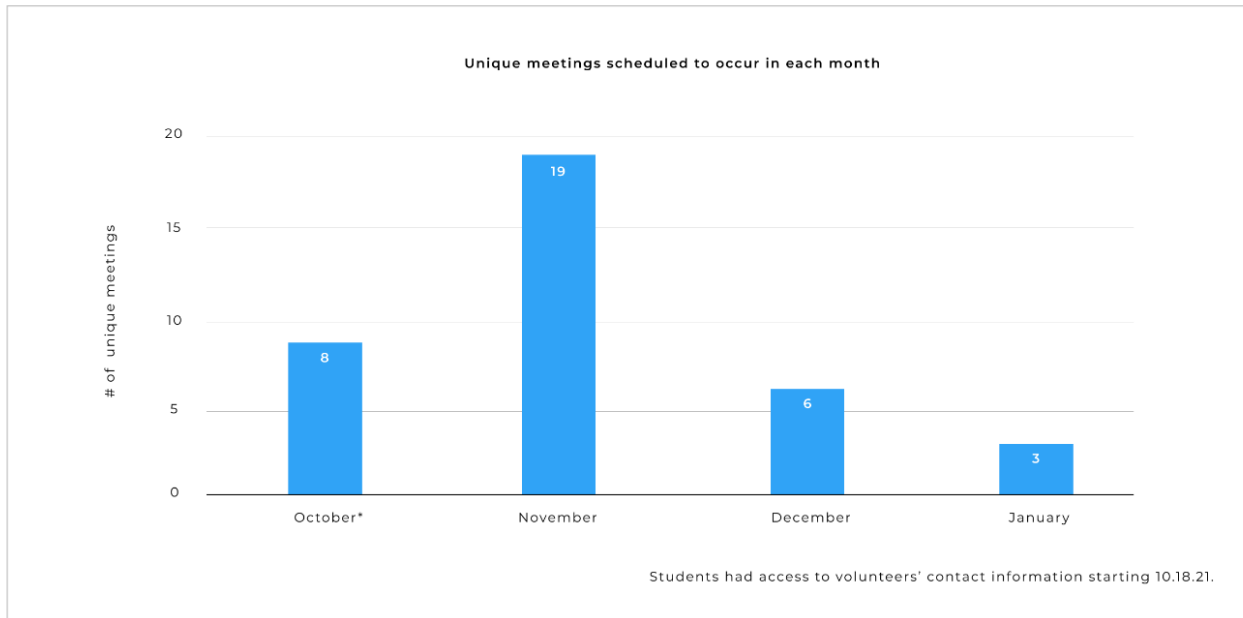


Table 3



APPENDIX J.

USAGE DATA (MODEL B)

In Model B, we used a third-party tool to collect schedule availability for March 2nd and 3rd along with preferred conversation topic(s) from students and volunteers. Using this information, this tool automatically matched students with volunteers and sent a calendar invite for the meeting with a meeting video link. Table 1 shows general usage data for this Spring pilot (Model B). Tables 2 and 3 show qualitative feedback from students and volunteers. This feedback was collected through a post-meeting survey and email exchanges. Evaluation is ongoing. Data was pulled on 3.10.22.

Table 1

26 # of students who opted into this pilot and submitted their schedule availability and conversation topic(s) of interest.	20 # of volunteers who opted into this pilot and submitted their schedule availability and conversation topic(s) of interest.	20% % of total participants who opted into this pilot (46 divided by 234 total students and volunteers registered in One-to-One as of 3.10.22).	23 # of matches made. This represents # of meetings expected to occur on March 2nd and 3rd.
10 # of unique meetings did occur (via feedback).	7 # of unique meetings in which at least 1 participant was a no-show (via feedback).	4.4 out of 5 Match rating (participants were asked to provide a 1-5 rating for the statement, "My match was a good fit for me")	94 Net promoter score (% of those who rated high minus % of those who rated neutral-low on likelihood to recommend the program)

Table 2

Student Feedback
Strengths "[VOLUNTEER NAME REDACTED] crystalized for me better ways to search for internships and also gave me some insight on different areas of supply chain management." "This is a great opportunity to talk with different people. My match is great! I have a good time with her. She gives me some advice on what should I do to improve my interview and get a network with people." "We both had the same interests and similar career paths. We also had a lot to talk about based on our goals and paths we are taking." "While it was a little awkward trying to figure out what was happening, it was a really good match. My match and I had a lot in common, and we hope to stay in touch. She gave some really great advice, and I wished I could've done the same. Overall, the experience was a good break from midterms." Challenges/Drawbacks "I think we should each send the times that we are available, then try to set a time that works for both of us."

Table 3

Volunteer Feedback
Strengths "[STUDENT NAME REDACTED] was really fun to speak with and I'm glad we had the chance to connect. Her career aspiration is to become a pediatrician and she had some questions about getting into med school that I couldn't answer since that's not my background, but I recommended that she also reach out to someone else at [FIRM NAME REDACTED] who is in the One-to-One database and who is an MD." "Speaking with [STUDENT NAME REDACTED] was an absolute delight! I enjoyed being able to chat with her about my college experience and career in the hopes I might have some nuggets of wisdom for her. It was wonderful hearing about her activities and dreams, and we plan to keep in touch!" "It was great speaking with [STUDENT NAME REDACTED]. He has a good head on his shoulders and he appears to be developing a strong plan to finish college and get into the workforce!" "Great conversation with [STUDENT NAME REDACTED], what his current interest is related to the field and type of company I am working with." Challenges/Drawbacks "This wasn't a great match mostly because the individual didn't seem like he knew what he signed up for. The other matches I had were very good. That said, I do think from his perspective he should've gained more than he expected." "The whole meeting process was confusing. I validated the meeting and kept receiving messages saying that I did not even though the meeting was showing on my calendar with a green check box. In the end the student did not come. I would suggest for the future a regular email contact from the student after the match to set up a zoom meeting so that we make sure to not block time for nothing." "The new system does not work for me as it is not the accepted platform in my organization. I need to schedule meetings using Zoom or Teams and couldn't edit the original invite to change to a Zoom meeting. We had to reschedule as [STUDENT NAME REDACTED] had a test during the scheduled time. I ended sending a new invite through my system for a Zoom Meeting next Monday at 11:00 am." "I got all confused this morning. Last week I added it to my outlook calendar. This morning it told me I hadn't accepted the meeting and when I clicked on the link provided it took me to gmail (which is my personal account). So now it is on both calendars." "FYI. I see this on my outlook and had accepted it but doesn't seem to register. The link took me to my google calendar but we use Outlook at work fyi so not sure if there is a compatibility issue. It's on my calendar so that's good."

APPENDIX K.

USER FLOW (MODEL A): THE ONE-TO-ONE PROGRAM MANAGER EXPERIENCE

This user flow maps Life Science Cares' steps using the One-to-One tech stack. This user flow describes our implementation in the fall of 2021 referred to as Model A. In Model A, students have access to a database of volunteer profiles and their contact information. Students can also view their 3 top recommendations based on profile data. Students have the choice to initiate contact with anyone. The One-to-One program manager user flow begins with opening the intake form created in Airtable, a cloud platform. This form links to a backend database that contains all students' and volunteers' profile information which was submitted earlier during the sign-up process. The letters represent steps with risks. These risks are explored in Appendix N.



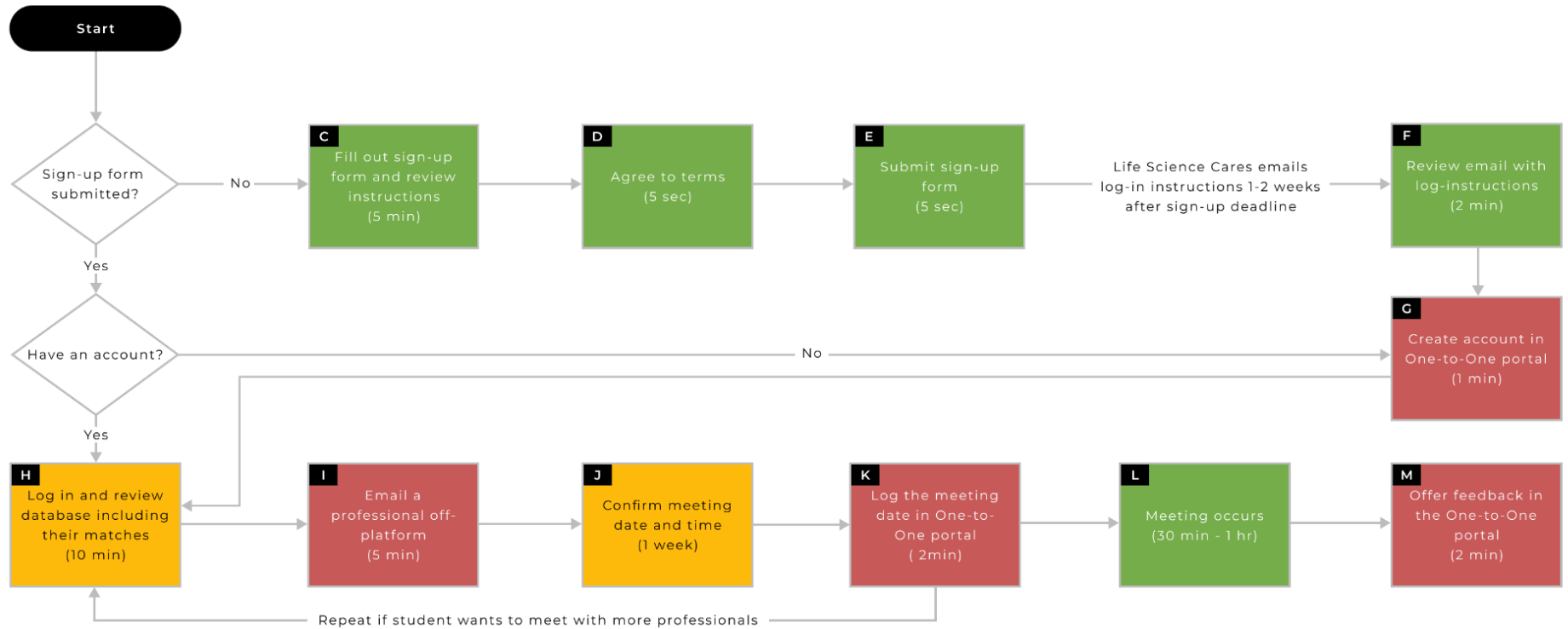
Steps with Risks

- Low risk of failure; can be mitigated with minimal effort
- Medium risk of failure; the intervention is clear but takes some time
- High risk of failure; requires significant adaptations that may strain capacity

APPENDIX L.

USER FLOW (MODEL A): THE STUDENT EXPERIENCE

This user flow maps a student's steps using the One-to-One tech stack. This user flow describes our implementation in the fall of 2021 referred to as Model A. In Model A, students have access to a database of volunteer profiles and their contact information. Students can also view their 3 top recommendations based on profile data. Students have the choice to initiate contact with anyone. The student user flow begins with submitting their profile information via an intake form created in Airtable, a cloud platform. The letters represent steps with risks. These risks are explored in Appendix N.



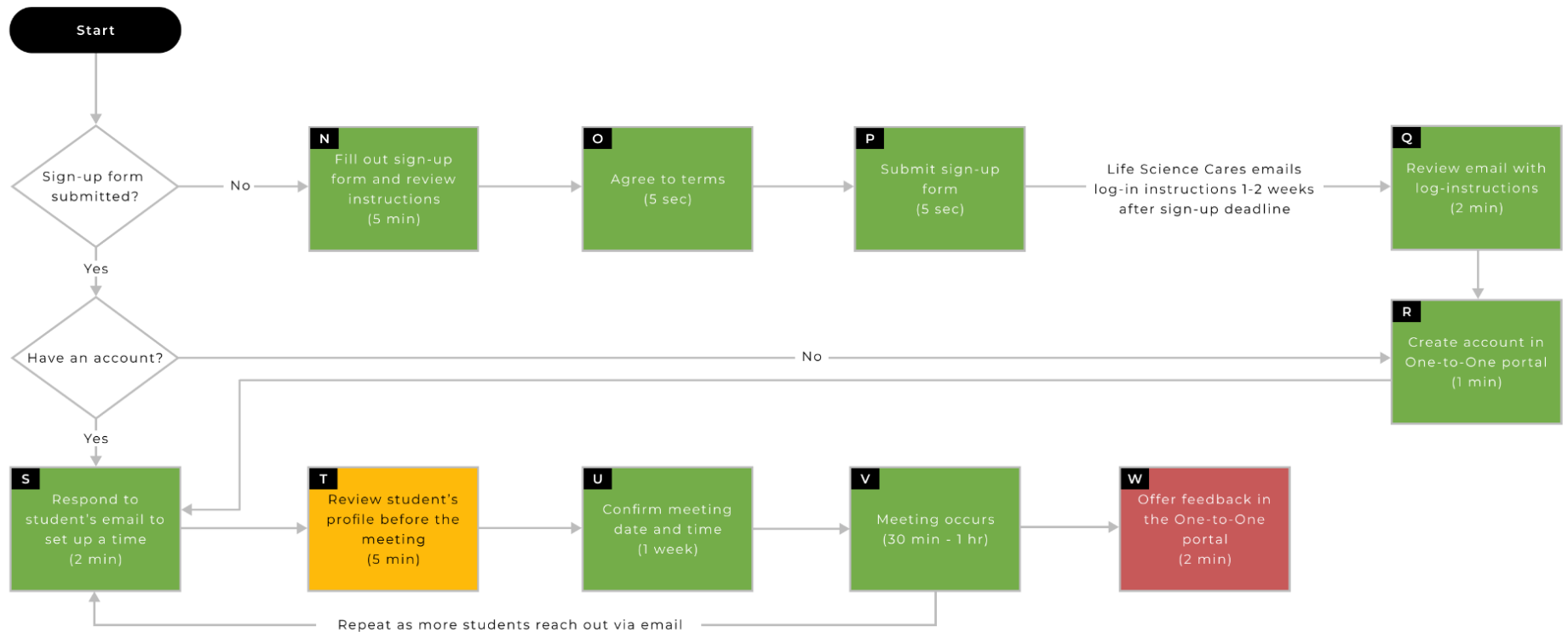
Steps with Risks

- Low risk of failure; can be mitigated with minimal effort
- Medium risk of failure; the intervention is clear but takes some time
- High risk of failure; requires significant adaptations that may strain capacity

APPENDIX M.

USER FLOW (MODEL A): THE VOLUNTEER EXPERIENCE

This user flow maps a volunteer's steps using the One-to-One tech stack. This user flow describes our implementation in the fall of 2021 referred to as Model A. In Model A, students have access to a database of volunteer profiles and their contact information. Students can also view their 3 top recommendations based on profile data. Students have the choice to initiate contact with anyone. The volunteer user flow begins with submitting their profile information via an intake form created in Airtable, a cloud platform. The letters represent steps with risks. These risks are explored in Appendix N.



Steps with Risks

- Low risk of failure; can be mitigated with minimal effort
- Medium risk of failure; the intervention is clear but takes some time
- High risk of failure; requires significant adaptations that may strain capacity

APPENDIX N.

PROCESS RISK ANALYSIS (MODEL A)

This table illustrates the different risks associated with Model A and the actions I took to mitigate those risks.

● Low
 ● Medium
 ● High

Risk Analysis				Evaluation				Risk Control			
User Type	Risk	Step(s)	Downstream impact	Probability	Severity	Overall rating	Tolerance	Risk control rationale	Mitigation	What happened	Actions taken
One-to-One Program Manager	Database-related (e.g. fail to correct typos in the email or organization name, duplicating student records)	A,B	Users cannot log in; inaccurate reporting; students appear twice in live database	●	●	●	Yes	Typos from users-inputted data is expected; remedies are straightforward and not a time consuming process	Export .csv to excel to lowercase emails and check for inconsistencies	Several emails needed to be lower-cased; few typos needed correction	Excel was used; duplicates were removed throughout the process
Students & Volunteers	Sign-up-related (e.g. failure to complete the sign-up form, not able to commit to program expectations)	C,D,E,N, O,P	Lose students early in the funnel	●	●	●	Yes	No way to currently track students who do not complete the sign-up form	Survey users for feedback on sign-up process; discuss with student support partners if value proposition is not compelling enough	Feedback interviews indicated that sign-up process was fast and intuitive	Revised sign-up deadline to give students more time
Students	Students do not create accounts in the One-to-One portal after signing up	F,G	Fewer students who are active in One-to-One	●	●	●	No	Students who do not create accounts in the first month are less likely to do so, leading to inactivity	Reminder emails and 15 minute onboarding calls	~50% of students did not follow through on creating accounts	Sent reminders through newsletters and targeted emails; added 15 min call with PM
Students	Students do not reach out to volunteers or fail to show up to meetings	H,I,J,L	Fewer students who are active in One-to-One	●	●	●	No	Increasing activity those who created accounts is a top priority	Reminder emails and 15 minute onboarding calls	~40% of students among those who activated accounts are engaged	Sent reminders through newsletters and targeted emails
Students	Students do not log meetings they have scheduled and completed	K	Inaccurate reporting	●	●	●	Yes	Unlikely to see significant improvement due to student self-reporting	Reminder emails and 15 minute onboarding calls	~16% of students reported that they scheduled a meeting but have not logged it yet	Sent reminders through newsletters and targeted emails
Volunteers	Volunteers do not respond to students or fail to show up to meetings	Q,R,S,T, U,V,W	Fewer volunteers who are active in One-to-One	●	●	●	No	Volunteers have limited bandwidth and may need more reminders	Reminder emails and setting clearer expectations with corporate partner contacts	~85% of volunteers activated their accounts; ~31% of volunteers have had meetings	Kick-off newsletter at the start of each Round
Students & Volunteers	Low participation in submitting feedback after each meeting	M,W	Lack of data to show impact	●	●	●	Yes	Increasing activity among those who created accounts is a top priority	Reminder emails and 15 minute onboarding calls	~35% of students and ~21% of volunteers with meetings have completed feedback form	Sent reminders through newsletters and targeted emails; scheduled post-meeting interviews

APPENDIX O.

COMPARING MODEL A WITH MODEL B

This graphic compares Model A which I ran in the fall of 2021 with Model B which I ran the spring of 2022. Both models resolved the feasibility concern raised after the 2020 pilots. While initial findings show promise, Model B surfaced several risks described here and in Appendix J. Towards the end of my residency, my supervisor and I agreed to continue with Model A. In the meantime, we will continue to evaluate whether One-to-One should include elements from Model B and if so, how those risks can be avoided or mitigated.

	Model A	Model B
	This was the fall 2021 pilot which ran from mid-Oct. to end of the Jan. This model continued to run in the Spring while Model B was piloted.	This was the spring 2022 pilot which ran from late-Feb. to early Mar. This pilot occurred concurrently with Model A in 2022.
Model	Students have access to a database of volunteers. They chose a volunteer to network with and schedule the meeting via email. Emails are included in the database. Basic filters allow for convenient search.	Students and volunteers submit an opt-in form to indicate their schedule within a predetermined date window. They also select at least 1 conversation topic. Technology matches a student and volunteer based on that information and sends calendar invite to both individuals.
Meeting cadence	Encourage at least 1 meeting per semester.	Students and volunteers opt-in once a month which means meetings are held monthly.
Tech Stack	R, Bubble.io, Airtable with miniExtensions integration	Airtable with miniExtensions integration, Orbiit
Matching	We make recommendations for students to contact using a weighted algorithm that looks at career interests, shared experiences, hobbies, and more.	Matches are based on calendar availability and at least 1 shared topic of interest.
Tracking	Students are asked to log meetings in the One-to-One portal. Logged meetings are tracked.	After each meeting date/time, automated emails are sent out to confirm whether or not the meeting took place.
On-demand networking	Yes. Students can contact volunteers at any time.	No. Students must wait to receive opt-in form once a month.
Custom user profiles	Yes. Students and volunteers have personalized profiles.	Yes. Students and volunteers have personalized profiles.
Benefits	Students can have just-in-time networking (beneficial to juniors and seniors about to enter the workforce). Puts responsibility on students to be intentional about who they contact resulting in more accountability in their preparation.	Reduces students' cognitive load of deciding who to contact and reaching out. Reduces back and forth emails to schedule meetings.
Risks	Difficult to track pace of meetings since they can occur any time. Greater emphasis on the quality and description of the top 3 volunteer matches since students can choose to contact anyone in the volunteer base. Students find the emailing process inconvenient and therefore do not participate. Requires some manual work of uploading student/volunteer data from the intake form and their matches into the One-to-One portal. Students need consistent reminders to schedule meetings with volunteers.	Students and volunteers have to wait until opt-in form is sent once a month to start the process. If students and volunteers are not available in the specified date window, they have to wait another month. Students lose the agency to choose who to contact and therefore may feel less accountable or motivated to show up to their meetings. Matching based on schedule and conversation topic may not appeal to students with specific meeting intentions or career interests. The process of indicating schedule availability and accepting automated meeting invites can be too complicated for some students and volunteers. Third-party tool does not adequately address issues faced by some Microsoft Outlook users when accepting and editing meeting invites.