Open Innovation Implementation in a Public University:

Administrator Design, Management, and Evaluation of Participatory

Platforms and Programs

by

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A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

Approved July 2016 by the
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ARIZONA STATE UNIVERSITY

August 2016

ABSTRACT

Public organizations have been interested in tapping into the creativity and passion of the public through the use of open innovation, which emphasizes bottom-up ideation and collaboration. A challenge for organizational adoption of open innovation is that the quick-start, bottom-up, iterative nature of open innovation does not integrate easily into the hierarchical, stability-oriented structure of most organizations. In order to realize the potential of open innovation, organizations must be willing to change the way they operate. This dissertation is a case study of how Arizona State University (ASU), has adapted its organizational structure and created unique programming to incorporate open innovation. ASU has made innovation, inclusion, access, and real world impact organizational priorities in its mission to be the New American University. The primarily focus of the case study is the experiential knowledge of administrative leaders and administrative intermediaries who have managed open innovation programming at the university over the past five years. Using theoretical pattern matching, administrator insights on open innovation adoption are illustrated in terms of design stages, teamwork, and ASU's culture of innovation. It is found that administrators view iterative experimentation with goals of impact as organizational priorities. Institutional support for iterative, experimental programming, along with the assumption that not every effort will be successful, empowers administrators to push to be bolder in their implementation of open innovation. Theoretical pattern matching also enabled a detailed study of administrator alignment regarding one particular open innovation program, the hybrid participatory platform 10,000 Solutions. Creating a successful and meaningful hybrid platform is much more complex than administrators anticipated at the outset. This chapter provides administrator insights in the design, management, and

evaluation of participatory platforms. Next, demographic assessment of student participation in open innovation programming is presented. Demographics are found to be reflective of the university population and provide indicators for how to improve existing programming. This dissertation expands understanding of the task facing administrators in an organization seeking to integrate open innovation into their work.

DEDICATION

This dissertation is dedicated to my two favorite people in the whole world.

Scott and Lilah, I love you!

ACKNOWLEDGMENTS

This dissertation was made possible through the support of many individuals and groups. I would like to thank the Center for Policy Informatics, Participatory Governance Initiative, and School of Public Affairs for my doctoral training, opportunities for research, and support. This dissertation results from a multiple year collaboration with Changemaker Central and the Office of University Initiatives. Our work on 10,000 Solutions, and this dissertation research, would not have been possible without the stalwart partnership that we developed during the management of 10,000 Solutions. Additional thanks are owed to Changemaker Central and the Office of Entrepreneurship and Innovation contributed participation data for this research effort, enabling an additional perspective on the use of open innovation programming.

I am grateful for the willingness of administrators from the Office of University Initiatives, Changemaker Central, the Office of Entrepreneurship and Innovation, the President's Office, The Arizona State University Foundation, Office of Educational Outreach and Student Services, Office of University Affairs, and KWALL to participate in this study. Additional thanks go to the College of Liberal Arts and Sciences Office of Student and Academic Affairs who assisted with data acquisition and preparation. My friend and colleague Dr. Casey Boyd-Swan was a constant source of support and expertise; I am forever grateful for your advice and assistance. Finally, I must thank the Office of Research Integrity and Assurance, who provided valuable guidance on numerous research project throughout my doctoral studies.

This research would not have been possible without the support of the National Science Foundation. Our research team received two grants, RAPID VOSS-1143761:

Understanding the Challenges Inherent in the Design, Execution and Participation in Governance Challenge Platforms, and VOSS-1322296: Understanding Participatory Governance Efforts Using Hybrid Platforms. This support enabled the timely and detailed study of the participatory platform 10,000 Solutions.

I was honored to be awarded as a research fellow to two organizations, and one academic society during my doctoral training. Those experiences provided a complimentary and unique perspective on open innovation and open governance. Thanks go to The New York University Governance Lab, the International Foundation for Electoral Systems, and the Consortium for the Science of Sociotechnical Systems for the opportunity to join you for a brief time. My experiences with your organizations deepened and broadened my understanding of opening governance.

A developing scholar is prepared for a successful career through the mentorship of her doctoral committee. Dr. Erik Johnston, Dr. Daniel Schugurensky, Dr. Karen Mossberger, and Dr. Justin Longo - the four of you walk the walk of a committee that teaches, supports, and inspires. I am incredibly grateful for the guidance provided over the years. In particular, I must thank my advisor, Dr. Erik Johnston. Six years ago, you made me feel like I was up to the task of getting a doctoral degree, and that with hard work I could contribute to the field of opening governance. Thank you for your patience and encouragement. I plan to spend the rest of my academic career proving that your belief in me was worth it.

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Overview

Organizations have been highly interested in integrative open innovation practices in their work, as open innovation can bring a flood of creative contributions and problem solving from the public. This was especially true in the early 2010's, where organizations from different sectors established opportunities for the public to contribute ideas to solve grand challenges, submit and sign online petitions, and respond to organizational calls. In the public sector at the national level, this was evidenced by the creation of the two prominent platforms Challenge.gov (2015) and We the People (2013); examples at the local level in Phoenix include MyPlanPHX, (2013) and iMesa (2013). The private sector also had a variety of open innovation platforms with prominent examples being Ashoka Changemakers, (2012), OpenIDEO, (2013), and XPRIZE (2013).

However, there are challenges in successful adoption for organizations. Noveck (2015) argues that organizations often address them using open innovation in name only, with little actual change taking place. One reason for this difficulty stems from conflicting organizational structures; open innovation practices are primarily online, fluid, rapid, iterative, and often temporary, whereas the command and control hierarchical structure of organizations are primarily located in the physical world, and intended to be stable to provide sustained services. There is a challenge for administrators in organizations who are designing and managing open innovation efforts for the first time; most administrators do not have extensive technological or socio-technical design background or training. Therefore, an entire new skill set must be developed on to use participatory platforms. Even if the design and tech know-how is part of an administrator's toolkit, they may not know

how to effectively align the goals, language, and evaluation metrics for successful implementation of participatory efforts. More often than not, administrators are attempting to run an open innovation effort in addition to their other, primary duties. Finally, even though open innovation tools like participatory platforms have existed for several years, there is high fragmentation of working knowledge, meaning that many administrators continue to experiment in de facto isolation. There is a need for insights from organizations that proactively integrate open innovation into their work to make the work of organizations more connected to their constituencies and increase the impact of the work being done within the organization.

The main research question guiding this research is what administrators within a public organization have learned about the design, management, and evaluation of open innovation efforts. Arizona State University was selected as a case study in innovation integration. This large public university has made a purposeful effort to integrate innovation values and practices into its organizational mission and provide innovation focused programming. Within this case study there are three smaller research questions. First, what substantive findings in thematic areas of values, teamwork, and organizational culture and innovation practices have administrators learned in their work with open innovation? Second, to what extent are different administrator groups aligned in their understanding of the three dimensions of values, teamwork, and organizational culture and innovation practices? Third, what insights into open innovation can be gleaned from a demographic survey of the innovative programming provided by the university and the students who participate in them? Findings from this research can contribute to a foundation about innovation management that can assist other administrators in organizations seeking to

integrate innovation and entrepreneurship practices into their core mission and daily activities.

This introductory chapter begins with a discussion of open innovation, and the challenges inherent in using innovation practices in organizations. Next is a discussion of the use of a public university as an appropriate field site, and contextual information about Arizona State University in particular. As this research is primarily focused on the experiences of administrators within the organization, a section on two types of administrators is presented. Administrative leaders and intermediaries share distinct but complimentary roles for innovation implementation. Finally, the organization of the dissertation is introduced.

Organizational Integration of Open Innovation

In recent years, new examples of innovative ways to engage and connect people have emerged in various sectors. Citizen science platforms contributed to medical discoveries (Khatib et al., 2011), the use of serious games provide perspectives into the lives and livelihoods of different groups (Learmonth et al., 2011; "Spent," 2014), as well as proactive problem solving on global challenges (Institute for the Future, 2011). Participants have bucked the assumption of disconnection and apathy through these new avenues for participation. Evidence of support for open innovation can be seen in the public sector through transparency efforts like Data.gov and participatory challenge competitions like Challenge.gov, and the private sector through efforts like Ashoka Changemakers and OpenIdeo. The creation of a diverse and robust civic ecosystem that includes people in problem solving and decision making within their community is not a passive process. However promise does not equate to success just as single successes do not indicate a

positive change in behavior. The purpose of this dissertation is to examine how administrators within an organization have learned to manage open innovation practices focused on its own civic and community participation.

Open innovation is fluid, rapid, iterative, and can be temporary in design. Many resources for innovating and invigorating the public sector come from the creative and interactive world of online participation. Online communities have been the laboratory for innovation in connectivity, collaboration, and creative problem solving. The particular open innovation tool in this dissertation is participatory platform. Participatory platforms are online tools that open the decision making of an organization to facilitate participation and collaboration of the members of the community in governance and administration of the community. Participatory platforms can support several different types of interaction, from crowdsourcing to collective intelligence, to serious games, to competitions, and, the primary goal for many, collaborative governance (Kelley & Johnston, 2012; Noveck, 2012). Many participatory platforms include some activities taking place in the real world, such as meetings, workshops, and competition finals. The presence of online and real world hybridity in participatory platform programming is another difference that sets open innovation efforts apart from more traditional forms of participation in and with organizations.

The allure of open, distributed participation comes from ideation that has an increased the diversity of perspective and voices and has been shown to be a key source of innovation and problem solving (Dawes & Helbig, 2010; Page, 2008; Surowiecki, 2005). Many organizations, by contrast, still organize around hierarchical command and control structures (Weber, 1978). Consequently, if these differences are understood, there are

predictable challenges for organizations interested in integrating open innovation into their work. The effective use of open innovation requires intentional shifts of organizational culture, primarily being willing to change the way the organization conducts business; institutional innovation has been one of the missing pieces for making open innovation effective (Noveck, 2015). Valuing open innovation and committing the organization to using these tools is only part of the challenge. The second component of the challenge is how to integrate such tools into the organization. The task of open innovation adoption tends to fall to administrative intermediaries. Evidence from the field indicates that first time mistakes tend to be repeated by administrators using open innovation tools due to lack of shared knowledge on the design, management, and evaluation of open innovation practices (Treisman et al., 2013). That means there is a need for administrators actively working on integrating open innovation in their organization to share insights into their work with open innovation. These shared management findings can have sizable impact into the continued evolution of organizations and how they interact in open innovation spaces.

Case Study Selection: Public university experimentation with innovation

There are a host of organizations and departments that focus specifically on civic participation within their particular realm of expertise such as the Google Civic Innovation, the NYU Governance Lab, Oxford Internet Institute, Facebook civic group, and MIT Center for Civic Media. These small, specialized groups contribute to the advancement of digital activity for increased participation and collaboration in public sector organizations. However, these types of organizations are specialists, and their active use of participatory platforms is not sufficient to encourage broad adoption of open innovation by organizations.

To truly achieve this culture shift, it is necessary to study how organizations that are not specialized research laboratories are integrating open innovation into their work.

This dissertation examines a case study of a public university that has articulated is own organizational mission of innovation and impact, and is experimenting with different approaches to realize the organizational goals. Arizona State University is a large public university whose president is advocating for a new model of the American university, focused on the inclusion of a large and diverse population, training those students to become adaptive master learners, and challenging the research and education services and programs to focus on real world impact and the solutions of problems. All of this is meant to be done at an enormous scale; currently there are over 82,000 students enrolled at Arizona State (Arizona State University, 2014b). Within this organization are administrative intermediaries- administrators tasked with the design and management of open innovation platforms and programming.

Though not a government entity, studying administrators within a public university remains relevant in the field of public administration. My justification for selecting a public university setting is that it is a sufficient and appropriate field site, not that it was deemed the best field site following an in depth analysis of all potential field sites in public sector settings. There are formal and legal reasons that the study of university administrators is applicable to the field. A public university, Arizona State University is part of the state university system, which receives funds from the state government for operation costs; in FY2014 the state university system received $711.2 million (Arizona Board of Regents, 2014), and so it has a responsibility for achieving public goals and is accountable to state

officials and the public. Therefore this research is grounded within the context of public sector administrators.

There are other compelling reasons why universities in general, and Arizona State University in particular, serve as an effective field location for research on open innovation. When examining innovation, there is an established connection between universities, public sector and industry (Etzkowitz & Leydesdorff, 2000), and knowledge developed in university settings lead to positive spillover effects in organizations from different sectors (Tödtling et al., 2009). Many local and state government departments may participate or host one open innovation or entrepreneurship effort. Arizona State University has run numerous efforts in this environment over the past four years. Over time, the efforts at Arizona State University have differentiated from each other in objective and design. This means that the administrators at Arizona State University may have an advantage over their state and local government counterparts when it comes to the design, management, and evaluation of participatory platforms. Etzkowitz et al. (2000) note a phenomenon where universities are becoming more active players in innovation processes by adopting entrepreneurial knowledge practices. This is certainly relevant in the case of open innovation. Universities are proactive members of experimentation with open innovation. Universities have served as catalysts and hubs for early open government research, such as the University at Albany's Center for Technology in Government who hosted an event leading to the development of a framework for open government ecosystems (Harrison et al., 2012), the University of Virginia's use of the participatory simulation game the UVA Bay Game to improve understanding of conflicting interests and management of a natural resource (Learmonth et

al., 2011), or Arizona State University's Center for Policy Informatics' lifecycle and design framework of participatory platforms (Treisman et al., 2013).

University innovation practices can have a ripple effect in current and future efforts in federal, state, and local government. Universities have a focus on education and innovation, meaning that more experimentation can take place with platforms, leading to greater expertise in the running of complex interactions in other areas of the public sector (Bozeman, 2000). The online learning of students increases their knowledge of how to participate in online and hybrid environments. Moving forward, these individuals may have more capacity than their peers who did not have these experiences. It also means administrator have the opportunity to collaborate with a more experienced and informed populace, thereby potentially increasing the success of future collaborations.

Arizona State University as the New American University

Arizona State University has been more proactive than most organizations in actively striving to integrate innovation into its mission, function, and evaluation. The university had a change in organizational objective at the start of President Michael Crow's tenure in 2002 with the vision to become the New American University (Arizona State University, 2016a). The New American University represents a fifth configuration of higher educational services that is present in the United States. Crow (2016) articulates the five waves of university services as follows:

- Wave 1- American ivy league universities. Greek school models.

  Example: Harvard, Yale
- Wave 2 - University structure similar to the ivy league schools, but with a secular foundation. Example: University of Virginia

- Wave 3 - Land grant universities. Providing broad educational access across the country.
- Wave 4 - Research universities with academic pursuits targeted towards specific knowledge areas. Examples: Johns Hopkins, Stanford
- Wave 5 - Arizona State University. Providing the rigor of wave 1,2, and 4, but with modest cost and at a large scale.

Arizona State University has distinguished itself from other public universities by its active adoption of open innovation. In 2016 Arizona State University was ranked as the #1 Most Innovative University in the Country by US News and World Report. President Michael Crow has been the primary catalyst for this organizational change. He has articulated the values and mission in several different ways. There are eight organizational design priorities articulated by President Crow for how the university is to serve in this new role of education. They include the leveraging of the location and demographics of its community, enable student success at scale, to focus on meeting social needs of the community, to have research span disciplinary silos, to value entrepreneurship and innovation, to be socially embedded using partnerships, to have meaningful impact and purpose with its research, and to engage globally (Arizona State University, 2016; Crow & Dabars, 2015). Also, there is a shift in preference away from siloed, hierarchical knowledge towards the transdisciplinary collaboration of many academic fields and the addressing complex problems of the world. Here is one example, "...the study of inequality of wealth would be studied by a collaboration of top minds around the world, enabled by technology" (Faller, 2016). Of specific note in all of this conversation by President Crow is training students to be what he calls adaptive master learners, who are trained to be successful in any environment with many different

people (Crow, 2016; Crow & Dabars, 2015). Arizona State University has formally integrated these aspirations into its organizational identity through the new charter. The charter has three primary objectives, including inclusion of a diverse and populous student body, aim for research that will impact the public good and improve the world, and to actively engage with broad communities rather than only academic communities (Office of the President, 2015). The university's efforts over the past five years are more in line with authentic participation (King, Feltey, & Susel, 1998) than other organizations that are using open innovation efforts to as a side experimentation that does not affect their primary mission or daily work.

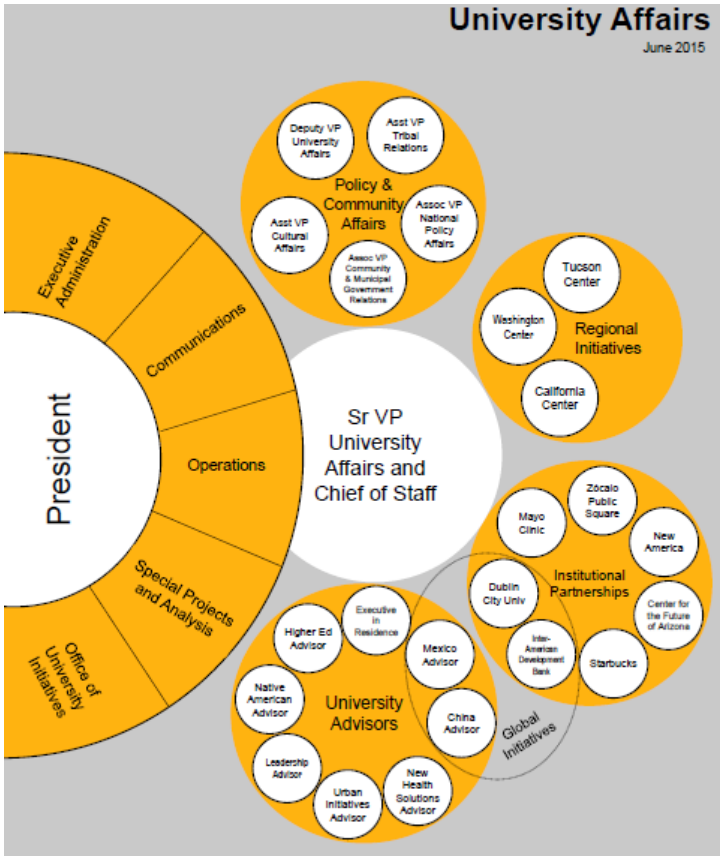
University Departments with Innovation Expertise

President Crow's objective for transforming a land grant university into an effective fifth wave university as expressed above requires a proactive approach within the organization of the university, as well as its programming. While some organizations may hire a consultant or have one staff member or small team that focuses on innovation, Arizona State University has multiple departments that are focused in experimenting and integrating innovation into the university in as many points as possible. Some of these departments focus solely on innovation implementation, whereas others were established before President Crow's tenure; these departments carry out more traditional service roles, but are collaborating with the innovation departments and experimenting with their own services to incorporate innovation into their traditional work.

There are five university departments included in this dissertation study on open innovation integration in the university. They include the Office of University Initiatives, Arizona State University Foundation, The Office of Entrepreneurship and Innovation, Educational Outreach and Student Services, and Changemaker Central. In addition to these

departments are cross department collaborations. Though every group mentioned above frequently collaborate, one in particular is highlighted in this dissertation, that being the collaborative management of the participatory platform 10,000 Solutions. An external contractor involved in the design of 10,000 Solutions is the final administrative perspective in this dissertation. Figure 1 is an organizational chart of the leadership structure of the university; this is the most recent chart available and was created in June 2015.

Figure 1.1: Organizational Chart of University Leadership



A brief description of each department included in this dissertation research and the 10,000 Solutions collaboration helps illuminate how different groups are working to realize the goals of the New American University through open innovation.

The President's Office. The Office of the President includes the University President and his staff. Their responsibility includes policy analysis, strategic planning, administration, and communication about the overarching goals, operations, and achievements of Arizona State University.

The Office of University Initiatives. The Office of University Initiatives is a department that was initially tasked to serve as a both an idea incubator and then developing ideas into workable projects that can be managed by other departments and groups in the university. The three initial objectives include the realization of the New American University through making projects within the eight design aspirations, to created social embeddedness within the university and between the university and community, and to stimulate university innovation (Arizona State University, 2016f) More recently, their focus has expanded to the creation of programs for global outreach.

The Office of University Affairs. The Office of University Affairs is a department within the President's Office. Their work includes the establishment of partnerships with external organizations.

Arizona State University Foundation. The Arizona State University Foundation serves a traditional and innovative role for the university. It's initial responsibility is securing philanthropic support; in addition, the Foundation seeks opportunities to fund academic and applied innovative ideas from both faculty and potential donors (Arizona State University, 2016b).

The Office of Entrepreneurship and Innovation. The Office of Entrepreneurship and Innovation is specifically focused on realizing the design aspiration of entrepreneurship and innovation for the New American University (Arizona State University, 2016e). Their work

is a combination of creating unique programming in their own department, but also creating entrepreneurship collaborations that span the entire university and include multiple departments and groups. These efforts are targeted primarily at the student body.

Educational Outreach and Student Services - The Educational Outreach and Student Services department is tasked with the provision of a broad range of student services within the university. Some of these services would be seen in any university, such as the management of the Memorial Union facilities. However, there are other efforts that are more proactive in ensuring diverse support for students during their time at Arizona State University and students who are not yet in college. Two examples are the group Changemaker Central, described in more detail below, using serious game platforms to prepare high school students for university education, and the administration of two charter high schools intended to prepare low income from diverse families to succeed in college (Arizona State University, 2016d).

Changemaker Central. Changemaker Central is a student lead group focusing on innovation that is identified as an Ashoka U Campus ("Changemaker Central," 2016). Changemaker Central is dedicated to creating a culture of empowered students who develop innovative ideas that can address local, national, and global challenges. The group not only has a physical presence on all four of Arizona State University's campuses, but also regularly hosts collaborative and cross disciplinary events to get students involved on a regular basis.

Collaborative management of the 10,000 Solutions platform - 10,000 Solutions is a participatory platform that engages people to take an active role in their community through the generation and evolution of ideas that can change the world. Begun as a straightforward ideation platform, the initial purpose of 10,000 Solutions was to generate an idea bank of

10,000 Solutions. The idea came from President Crow and first designed by the Office of University Initiatives. The platform management became a collaborative effort when a multidisciplinary research team led by the Center for Policy Informatics in the School of Public Affairs received a National Science Foundation Rapid VOSS grant to conduct research on participation in this bottom up platform. The primary management partnership shifted in the second year of the platform with the Center for Policy Informatics research team and Changemaker Central taking the lead management roles, and the Office of University Initiatives stepping out, as they are designed to do with projects of this nature. The research team received a second National Science Foundation grant to continue the study and management of the platform. 10,000 Solutions was redesigned from an ideation platform to a platform where participants could share solutions, host or participate in challenges, or host or participate in actions. It was intended that each action could be built upon and connected from one type of participation to another, creating a seamless and continuous practice of innovative thought and action at the university.

Center for Policy Informatics. The Center for Policy Informatics is situated within the School of Public Affairs, and focuses on the study of how public policy and administration can be improved through the use of communication and computational technology. One of the specific research areas of the center is opening governance. The director of the center, Dr. Erik Johnston, is a member of the MacArthur Research Network on Opening Governance. The center designed and studied two participatory platforms that support public ideation for solving a government or community challenge, including the federal level Policy Challenge and the Arizona State University focused 10,000 Solutions.

KWALL. KWALL is a contract company that specializes in the design of web platforms and online tools used in higher education environments. In the context of website development, the company markets itself with skills to take information only websites and transform them into personalized, interactive online tools. They work primarily with Drupal, which is an open source content management system.

The departments and collaborations that are described above could not happen without the informed, purposeful, and rapid action of the administrators that oversee each area within the university. Administrators have a vital role in the integration of open innovation, serving as advocates, designers, managers, support staff, and evaluators. The amount of learning that has taken place on the part of these administrators may not be captured in more quantitative evaluation approaches. A primary contribution of this dissertation is the study of administrator learning in the design, management, and implementation of open innovation practices. The next section makes a distinction between two key roles that administrators play in this case study. The first is that of the administrative leader and the second is that of the administrative intermediary.

Administrators

There are two administrator groups included in this study including administrative leadership and intermediaries. Both have been identified as essential groups for the design of user-driven innovation ecosystems (Schaffers et al., 2011). This section defines the identities and functions of each administrator group.

Administrative Leaders

Administrative leaders are individuals in public organizations who approve and support open innovation efforts. These administrators contribute the second phase of online

interaction discussed by Leighninger (2011) where people are empowered to contribute to social issues. Administrative leaders are not necessarily responsible for the detailed management of a participatory platform, but rather support the efforts of intermediary administrators who do manage the platforms, provide resources for the efforts, and are responsible for integrating the contribution of platform efforts into the work and future goals of the organization.

Administrative leadership can be of several minds when it comes to more interactive forms of collaboration and decision making. The potential for innovating public services through open innovation is an exciting prospect for administrators (Treisman, Johnston, Kelley, et al., 2013). Currently, online participation can strengthen representative democracy and administration by increasing the breadth and depth of activities available for the public. At this point in time, there is no challenge to government authority when it comes to decision making from online participation (Coleman & Gotze, 2001; Fung, 2006). There are arguments that improved public participation can improve perceptions of public sector legitimacy (Innes & Booher, 2005). Arguments for government as a platform (O'Reilly, 2010) leads to new opportunities to experiment with how the public sector can interact with other people on a regular basis. In addition, enabling people to work on issues that matter most to them means that a veritable army of contributors can be mobilized to help provide public service (King, Feltey, & Susel, 1998). On the other hand, there are uncertainties and difficulties that also make administrators skeptical. For instance, technology almost always outpaces policy, meaning that there are concerns about the legality of new forms of participation in online spaces (Leighninger, 2011). An illustrative example that is relevant in

universities is the uncertainty about intellectual property of ideas that are posted in online forums or entered in university competitions (Monotti & Ricketson, 2003).

In addition, there are also findings that show while people may become increasingly accustomed to interacting with public sector online, it does not necessarily increase confidence in perceived legitimacy (McNeal, Hale, & Dotterweich, 2008). Administrators may be advised to avoid offering online communication if there is a chance it will be a gimmick (Coleman & Gotze, 2001), yet many receiving institutions do not know how to design an effective online open innovation effort; there are multiple instances for duplication of first time efforts, meaning that without a shared repository of design and participatory research and experience many institutions will have online open innovation experiences that are not as effective (Treisman, Johnston, Kelley, et al., 2013). Another difficulty that administrators need to think about with online open innovation is the representativeness of its participants. Whether there are differences in how people access the internet (Mossberger, Tolbert, & McNeal, 2007), or the fact that people who volunteer to participate may not be representative of the entire population (Leighninger, 2011), administrators are responsible for ensuring that outcomes from an online open innovation event benefit their entire constituency.

There are preparatory considerations that administrative leadership must be prepared to support to facilitate a useful experience. The first consideration is that administrators need to be committed to the process from start to finish (Alexander, Comfort, & Weiner, 1998; Ansell & Gash, 2008). Processes that focus more on collective action and decision making are more complex than sharing information or other one way interactions. If the administrators responsible for the open innovation effort are not willing to commit to the

process, it is highly unlikely that the effort will yield successful outcomes. The second consideration is not to be tempted to take shortcuts or cutting corners in their preparations- such shortcuts may appear to save time but can compromise the overall effectiveness of the open innovation effort (T.A. Pardo & Scholl, 2002). A foundational starting point that is reinforced in the policy planning dimension of design is the thoughtful reflection of the context of the open innovation effort. In other words, receiving institutions need a basic understanding of the information needs of the organization, the environment, receptiveness of participants and potential partners (T.A Pardo, Gil-Garcia, & Burke, 2008). The interoperability of an organization, as discussed by Pardo et al. (2008) indicates that alignment between administrators within the organization about such goals are important. Alignment between administrator groups is a dominant research question in this dissertation research.

Understanding context includes being familiar with the range of participatory arrangements available to them and what the outputs and potential outcomes of using each arrangement can be (Smith, 2009). Part of the preparation phase includes making sure adequate personnel, time, and monetary resources are available throughout the open innovation effort (Leighninger, 2011). The time for planning is longer than an administrator may initially think; Treisman et al. (2013) recommend six to nine months for preparation, six to nine months for participant engagement, and reach out for partners three to six months prior to the participatory launch. Then comes many layers of decisions that will influence the choice of online open innovation tool including who will participate, how they will participate, and how the organization plans to use the information (Fung, 2006). Another consideration during preparation is whether the targeted participant groups have the

sufficient skills and capacities to meaningfully contribute to the open innovation effort (Cuthill & Fien, 2005).

The International Association for Public Participation (2007) is the primary framework I rely on as a heuristic for the range of activities that are available to receiving organizations, though there are many others in the literature. The reason the IAP2 is so helpful is the emphasis on alignment of activities; it is fine for an open innovation activity to take place at any point on the open innovation spectrum, but the associated communication must accurately reflect what is going to take place. Mergel & Desouza (2013) also found that clarity of language in a call for participation is essential for usable contributions. The clarity of language not only helps with contributions that are useful, but clear communications of expectations can increase the likelihood of a diverse group of volunteers being able to meaningfully contribute (Cohn, 2008). I will now transition to the discussion of intermediary administrators who work with administrative leadership.

Administrative Intermediaries

There is a unique role for intermediary professionals who specialize in innovation, design, and open innovation. Intermediaries have a facilitation role, "...(intermediaries are) an organization or body that acts as an agent or broker in any aspect of the innovation process between two or more parties" (Howells, 2006). These are the people who have an understanding of people, organizations, and technology and use that knowledge to make connections to help people advance their work (Bakici, Almirall, & Wareham, 2013). The field of literature most relevant on intermediaries is in the context of innovation due to their contribution to the open innovation movement (H. W. Chesbrough, 2005; Howells, 2006; Stewart & Hyysalo, 2008). Public institutions would be interested in intermediaries for

creating collaborative projects with open data or creating a technologically mediated experience. There are a few terms that can represent this group of people in the online open innovation process, but intermediary is the most comprehensive for the types of work. (H. Chesbrough, 2006) notes that intermediaries can serve multiple functions in connecting people with technologies, serving as agents, brokers, or marketplaces (Kivimaa, 2014). (Agogue, Ystrom, & Le Masson, 2013) note that intermediaries in the innovation literature primarily broker and network between people and technologies.

When dealing with people and technology, intermediaries have certain areas of expertise to facilitate a successful process. Some examples of guidance that intermediaries provide include articulation of expectation and visions, building social networks, developing learning processes (Kivimaa, 2014). An example of research demonstrating intermediary knowledge in the participation literature is Nabatchi's (2012) recommendations for designing participatory activities that meaningfully contribute to public service. One aspect of an intermediary's role is to keep the process moving quickly.(Gothelf & Seiden, 2013) designed the LeanUX, a collaborative experience process that relies on rapid iteration of brainstorming and dialogue to advance an idea to the point where it can be implemented effectively. Agogue et al. (2013) note that intermediaries tend to rely on processes that use multiple stages of participation to improve the outcome of the process. These processes usually include brainstorming, individual reflection, discussion, group work, and entire group refinement. (van Lente, Hekkert, Smits, & van Waveren, 2003) note that in addition to using multiple stages within any given participatory event, intermediaries are also trained to facilitate long term innovation projects.

One characteristic I use to define an intermediary is a person or organization that

takes responsibility for the creation, maintenance, and improvement of the open innovation mechanism itself, not just the outcome. A specific example is the General Services Administration for Challenge.gov. They provided a platform that federal agencies could use to host challenges that are open to the public, "They (GSA managers) manage all aspects of the platform, including training and support for federal agencies that are starting to launch their own contests online" (Mergel & Desouza, 2013, 884). The designer of Patients Like Me, Jamie Heywood, could also be considered an intermediary as he created a platform users would share personal information and replicate clinical trial research through the aggregated data (Heywood, 2009). For this reason there are many more design professionals serving the role of the intermediary than professionals trained in public administration or policy. However, as both mandated and voluntary experimentation takes place at all levels of government, professionals in public organizations are taking on more active roles in this effort. Intermediaries do not have to work alone; rather, there are instances of organizations partnering with a design team to fulfill the function of an intermediary.

There are times when administrators serve both as the intermediary and the recipient as an online open innovation effort may be developed in house. There are drawbacks to a public agency going alone for online open innovation development. First, lack of experience can cause administrators to repeat first time problems or errors already made by others if there are no examples of previous work readily available (Treisman, Johnston, Kelley, & Krishnamurthy, 2013). Second, public sector organizations have responsibility to carry out mandated duties and this responsibility can supersede the interests and efforts to try new online open innovation experiments. Having a dedicated intermediary who is committed to trying out the experience can keep new efforts alive. Third, the collective action component

of open innovation requires the knowledge of participation, decision making, deliberation including research and new practical experiments in the field. Fourth, technological design and operation matters and agency members may not have the technological sophistication to design an open innovation mechanism on their own.

There are some important distinctions between this analysis of intermediaries and that of administrative leadership. The objective of administrative leaders is to look at a more macro level, where many individual participatory platforms and numerous other efforts combine into a complex system that makes up the identity of Arizona State University. Intermediaries have a different identity and task. Typically couched within a department, center, or innovation entity, a participatory platform is much more integral to their particular job. For instance, 10,000 Solutions was a signature project of Changemaker Central. This means that part of Changemaker's identity and reputation was connected to this platform. A second difference is that intermediaries are tasked with the management of these platforms. This requires an entirely different skill set, most often requiring collaboration or contracting to accomplish. Therefore, the questions posed to intermediaries are focused at the platform level rather than the Arizona State University level. Questions are more detailed about the management and learning that has occurred during the experience of working with the platform.

Dissertation Outline

There are four chapters in total for this dissertation. This first chapter has provided the context of this research in three parts- organizational integration of innovation, presentation of Arizona State University as a case study, and two administrator functions within the university. The second chapter is a comprehensive analysis of administrator

interviews in my case study. In particular, the chapter examines administrator insights and learning about values, teamwork, and innovation culture derived from their experiences managing open innovation programming at the university. There are two analyses included in this chapter; the first analysis focuses on concepts from each interview question with the entire respondent sample. The second analysis examines a subset of the respondent sample for administrator alignment of perspectives when working on the same project. This chapter includes an explanation of my methodological approach, theoretical pattern matching, and introduces a conceptual map that includes my theoretical concept, attribution, concept research question, concept propositions, administrator alignment research questions, and administrator alignment propositions. The analysis section systematically presents results for the concept level responses and the alignment of university administrators. The third chapter is a demographic survey of program and participant participation of innovation, entrepreneurship, and social engagement programming at the university. The fourth and final chapter is a concluding discussion of how the findings from this dissertation can inform scholarship and practice in public administration, organization studies, and innovation communities.

Chapter 2 - Administrator Experiences of Managing Open Innovation Programming

Overview

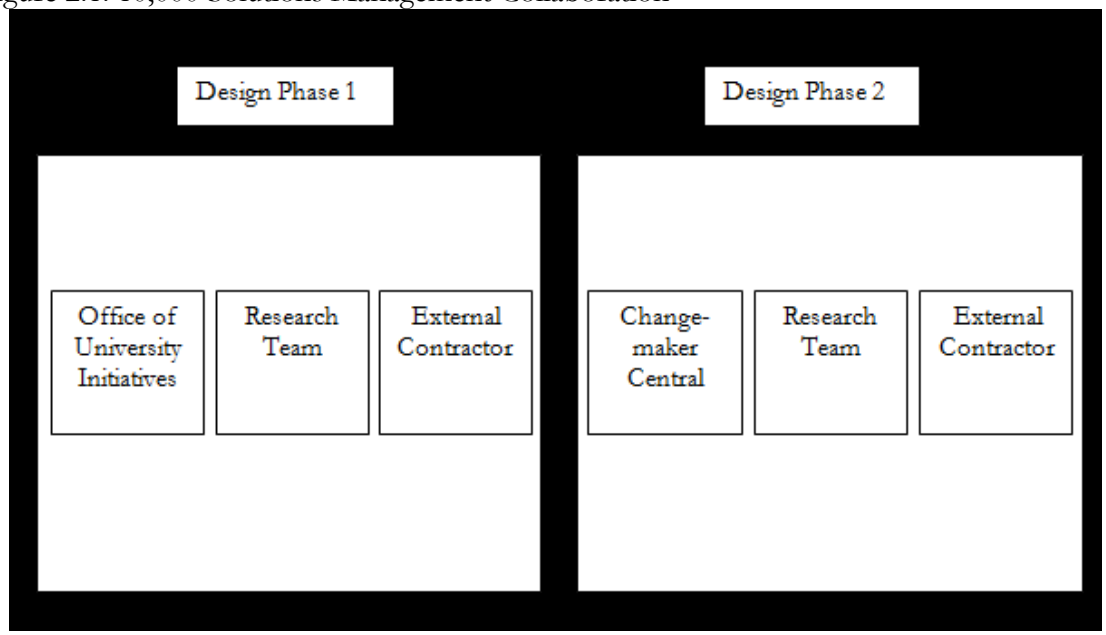
Chapter One provided a contextual foundation for the case study of Arizona State University, and how its administrators are striving to incorporate open innovation into the organization's daily and strategic practices. This shift in organizational culture does not happen as a natural process. Adapting the fundamental assumptions and practices of work for administrators will only be established through consistent pressure and incentives from both internal and external forces within the university. Administrators working in such an environment gain insights about integrating innovation into daily responsibilities and strategic action by the department. There are two research questions posed in this chapter. First, what substantive findings in areas of values, teamwork, and innovation culture practices have administrators learned in their work with open innovation programming? Second, to what extent are different administrator groups aligned in their understanding of the three dimensions of values, teamwork, and organizational culture and innovation practices?

Two separate analyses were conducted to address these research questions. The first analysis, focused on interview responses the each theoretical concept, and uses the entire respondent pool collected for this dissertation research. Administrators in this analysis have a variety of projects and responsibilities relating to open innovation at the university. Each department and its primary responsibilities that interview respondents work for are identified in the first chapter. The second analysis focusing on alignment uses a subset of the interviews where administrators worked on a shared project. It is possible to see how aligned the different views of partners are, and, if applicable, how much flexibility for different views

a project can sustain while still being successful. The other difference between the alignment analysis and the concept analysis is the coding of administrator responses according to their role in the university; administrators could be manager-leaders, staff-leaders, manager-intermediaries, and staff-intermediaries. These roles are used as comparative groups to examine alignment. Interoperability, or the understanding of organizational objectives by administrators is an important component of advancing organizational change (Pardo et al., 2008). There is more messiness in examining the details of collaboration from the perspective of administrators with unique roles, responsibilities, and history with the project. The examination of alignment can also be more rewarding in terms of providing insights to other administrators who are interested in leading, joining, or supporting a collaborative project.

The project which the participant subset worked on was 10,000 Solutions. 10,000 Solutions is a participatory platform that engages people to take an active role in their community through the generation and evolution of ideas that can change the world. Begun as a straightforward ideation platform, the initial purpose of 10,000 Solutions was to generate an idea bank of 10,000 Solutions. 10,000 Solutions was redesigned from an ideation platform to a platform where participants could share solutions, host or participate in challenges, or host or participate in actions. It was intended that each action could be built upon and connected from one type of participation to another, creating a seamless and continuous practice of innovative thought and action at the university.

Figure 2.1: 10,000 Solutions Management Collaboration



This chapter begins with a brief discussion of organizational learning literature before moving into a description of the analytical approach and data preparation. The results of each analysis are paired together in the results section. Discussions for each thematic area of values, teamwork, and innovation culture are presented.

Organizational Learning Literature

Organizational learning has a unique theoretical contribution to this study of public administrators experimenting, adapting, and evolving their work with the use of participatory platforms. Jones (2001) provides an explanation for understanding change in organizations, where human institutions are influenced to change both by external pressures and internal efforts of individuals; this change in turn influences different expectations of individuals and conceptions of institutional capacity. Jones argues that much of the behavior and decision making of individuals is and must be adaptive as the external environment is constantly in motion. Organizational learning does not just improve the internal workings of the organization, but can change the very organization itself. This is articulated as transformative

learning where evolving practices and decisions lead to a transformation of the organization or individual making the decisions (Mezirow, 1991). The goal of using participatory platforms is not only to maximize the utility of a particular tool, but to make opening up decision making processes in organizations a viable choice, hence transformative learning. If transformational learning is the objective, other research on learning can provide the guidance on how to enable this transformation to occur.

This limitation of rational decision making means that individuals within an organization must learn how to manage programs with unknown elements. First, it is impossible for any individual or organization to know all information relevant for action and decision making; this applicable lesson is defined as bounded rationality where individuals are not able to see completely see the world due to a lack of certainty about the future, a vast amount of information, and limitations of the person and organization to process all possibilities (Simon, 1997). Bounded rationality is certainly applicable in the study of participatory platforms where the tools themselves are still being developed. This means there are several elements of uncertainty [a] what types of interaction are possible in online environments, [b] how participatory platforms can be integrated into organizational practice, and [c] how to balance the protection of a potentially useful tool with the organizational requirement of demonstrating use quickly to justify the investment of human and financial resources. Second, individuals and organizations do not learn in isolation, but in connection with their environmental context. Of particular relevance is the organizational and political bureaucratic factors that guide learning during decision making (Allison & Zelikow, 1999). Third, administrators have resources available to them when dealing with uncertainty. For instance, administrators have three heuristics to guide decision making and corresponding

behavior including governing variables, action strategies, and consequences (Argyris & Schön, 1974) or environmental filters such as immediate task processing, lifeline environments tapping into past experiences, and biological environments that shape how the administrator makes decisions (Jones, 2001). Fourth, administrators can rely on iterations between single loop learning, incremental learning about project that do not change the norms or practices of the organization, and double loop learning, learning that causes an evolution of organizational norms and practices. through use of the platform (Argyris & Schön, 1974). Fifth, the matching of individuals with particular cognitive and technological skills with the jobs they are assigned to complete has a large impact on organizational learning (Hayes & Allinson, 1998). This will be significant in the study of administrators and participatory platforms, as different administrative groups may articulate unique struggles or successes with managing platforms in their department.

Theoretical Pattern Matching

Qualitative methodology is helpful for this inquiry. The detailed reflections and lessons learned by administrators over time are not going to be captured either through the platform artifact or programmatic documentation, such as annual reports. Likewise, the experiences gained by administrators in the organization can be considered a metric for success regardless of the success of the effort itself. Another reason for using qualitative analysis for this study is the ability to examine unique substantive dimensions, and ask administrators directly about difficulties in the process of design, management, and evaluation of open innovation efforts. The analysis of this chapter uses theoretical pattern matching articulated by Yin (2013) and used as an analytical approach in studies such as the

Mossberger's (2000) study of the spread of enterprise zones. The process of theoretical pattern matching occurs in four phases as articulated by Yin:

1. Identify theoretical concepts of interest for the case study
2. Operationalize the theoretical concepts through the development of an interview protocol with individual questions for each concept
3. Make predictions about responses to each interview question
4. Compare the prediction with responses from study participants

Theoretical concepts, attribution, and corresponding predictions for the concept analysis and alignment analysis are reported below. Appendix A of this dissertation includes a table version of the written description below..

Design Stages

Having a vision of what the open innovation effort is intended to accomplish within an organization is essential for effective implementation. The purpose of this section was to examine how administrators articulated the design values for their innovation effort, how the management of the effort achieved those values, and changes that needed to be made to the effort to realize those objectives.

- Organizational outcomes are the combination of an institution and its preferences (Plott, 1976, 1991). Arizona State University's organizational outcomes are the objectives of the New American University, which are comprised of inclusion, impact, and broader community engagement (Office of the President, 2015). The interview question for this proposition is: What was your participatory platform intended to accomplish within the workings of your organization? Within ASU? Concept Prediction: I predict that the New American University mission and design

values will be prominent in the responses of administrators, and will also be consistent with the mission of the department in which they operate. Alignment Prediction: I predict each administrative department will have a slightly different articulation of the purpose of 10,000 Solutions within the department and within the university. I anticipate alignment of administrators within department groups.

- Governing variables are values that administrators strive to keep within an acceptable range through their actions (Argyris & Schon, 1974). This question is used to have administrators articulate the purpose of their open innovation effort. The interview question for this proposition is: What values and actions were important to promote through the use of your participatory platform? Concept Prediction: I predict administrators will emphasize an objective of active participation or learning. Alignment Prediction: I predict administrators will share values and actions that are consistent with their articulation of the organizational outcomes. I do not anticipate different responses from staff and manager administrators.
- Action strategies are strategies intended to keep governing variables in an acceptable range. (Argyris & Schön, 1974). The interview question for this proposition is: How did the design and management of your participatory platform realize the values and actions you articulated? Concept Prediction: I anticipate administrators will articulate how the design of the innovation effort contributed to the organizational outcome. Alignment Prediction: I anticipate that administrators will have a consistent understanding of the design of 10,000 Solutions, based on the time they were involved. Administrators involved earlier in the lifecycle will know about the first design iteration, whereas administrators involved throughout will understand both.

- Satisficing is a concept from Simon (1997) where people need to know just enough to make a decision, not knowing every possible piece of information or option as would be expected in rational decision making. The interview question for this proposition is: How did your team draw boundaries on how much research and learning was necessary about participatory platforms before you began the design or management of your own platform? Concept Prediction: I predict that administrators for the most part did a minimal amount of research before designing and managing their effort. Alignment Prediction: I predict that intermediary administrators did far more research and planning than the leadership administrators. At the same time, I anticipate a consistent response of experimentation due to the novelty of a participatory platform.
- Single loop learning indicates when an organization makes changes that are consistent with its existing norms and practices (Argyris, 1976; Argyris & Schon, 1974)). The interview question for this proposition is: Were there design changes needed to your platform to realize the objective of the platform? If so, what were those changes? Concept Prediction: I predict that a majority of the insights to this question, and the interview itself, will be reflective of single loop learning. This is due to the fact that the larger normative change within ASU was the development of the new charter, which occurred prior to any of the efforts included in this study. Alignment Prediction: This question will be most insightful for administrators that were knowledgeable about both iterations of 10,000 Solutions. I anticipate intermediary managers and staff have the best understanding of needs from the first platform iteration and the design changes made in the second iteration.

- Consequences in this case are indicative of actions that have intended and unintended consequences. (Argyris & Schön, 1974). The interview question for this proposition is: How successful was the design and management of your platform at realizing your values and action objectives? How do you measure success? Concept Prediction: I anticipate generally positive assessments for projects or programs that were simple in design; as design complexity increases, I anticipate more mixed results. Alignment Prediction: I predict that administrative leadership managers and staff will have a more positive, and rather general view of the success of 10,000 Solutions. I anticipate that with greater proximity to management of the platform, administrator assessment of 10,000 Solutions will become more detailed and more negative in assessment.

Teamwork

Open innovation requires teamwork to be successful, both within a department, organization, and external partners. The purpose of this section was to gain insight into how administrators managed the process of the innovation effort within the university.

- Past experiences, both professional and personal are important aspects of what a team member brings to a collective effort (Jones, 2001). The interview question for this proposition is: What professional and personal experiences did your team have that was helpful for the management of the platform? Were there any past experiences (or lack thereof) that were unhelpful? Concept Prediction: I anticipate responses from this question will be somewhat important. I do not think that specific training in innovation or online technological skills will be highlighted in responses. Of more impact will be administrator experiences with substantive

innovation areas and the ability to manage such efforts. Alignment Prediction: I anticipate responses that there will be high amounts of alignment of this question from all administrators, regardless of department or role. This is due to the novelty of 10,000 Solutions as a participatory platform.

- Skills match indicates individuals with particular cognitive and technological skills, and the jobs they are assigned to complete, has a large impact on organizational learning. (Hayes & Allinson, 1998). The interview question for this proposition is: What skills were needed to design and manage your participatory platform? Did you need to develop a new strategy for managing these platforms? How did your team and (if applicable) your partners divvy up those responsibilities? Concept Prediction: I anticipate that administrators with open innovation experience will have a strong sense of the skills needed to successfully run a project or program. Alignment Prediction: I predict administrators with daily managerial roles for 10,000 Solutions will have a richer description of what is needed on a team. These will primarily be intermediaries as they have the job of design and management of the platform.
- Interoperability is the property of a system that allows different groups to communicate, collaborate, and coordinate in the execution of an effort (Cresswell, Canestraro, Gil-García, Pardo, & Schneider, 2004; Gottschalk, 2009; Pardo, Nam, & Burke, 2011; Peristeras & Tarabanis, 2000; Schaffers et al., 2011). The interview question for this proposition is: How did the different groups managing your participatory platform communicate, coordinate, and collaborate to make the platform work? What would you say these groups were good at doing together (exp: same vision, shared understanding of resources needed)? Were there times where

the groups had different or conflicting ideas of what needed to be done? Concept Prediction: I predict that interoperability is vitally important for the outcome of each innovation effort. I also anticipate that this question can be a way of assessing how the administrators themselves are becoming master learners of innovation practices. Alignment Prediction: I predict that interoperability will be consistent in administrator responses in a number of ways. First, I think all partners value and appreciate each other. Second, I think all partners will express that collaboration was not perfect, and there were issues limiting effective management. Third, I anticipate that administrators internal to the university will express frustration with the external contractor.

- Organizational learning is when human institutions are influenced to change both by external pressures and internal efforts of individuals; this change in turn influences different expectations of individuals and conceptions of institutional capacity. (Jones 2001). The interview question for this proposition is: What did your team learn about itself through the experience of running your participatory platform? What did your team learn about ASU through the experience of running your platform? Concept Prediction: I predict that administrators will have a better understanding of what is required to make an impact within the university. Alignment Prediction: I predict that all administrators will have a better understanding of facilitating a bottom up effort at the university. I anticipate intermediaries will have a substantially expanded expertise of what it takes to run a participatory platform like 10,000 Solutions. I also anticipate more fatigue from intermediary administrators than leadership administrators.

Innovation Culture

Innovation is not just a concept but a practice that requires purposeful thought and effort. The purpose of this section is to better understand how administrators perceive their work and experiences in the larger mission of the university. Questions also include concepts of transformation of change, both for the organization and the administrators working to integrate innovation into the university.

- Double loop learning indicates changes being made to behavior including scrutiny and willingness to change established norms, practices, and goals (Argyris, 1976; Argyris & Schön, 1974). The interview question for this proposition is: Has the management of participatory platforms caused reflection or changes to the goals, norms, or practices of ASU? Concept Prediction: I anticipate that administrators will articulate their contribution more in service to the existing structure of the organization than in changing it. This is likely unique to this case, as ASU made an organizational objective to include innovation in its work prior to any innovation efforts. Therefore, the double loop learning is indicated through the existence of these efforts rather than the other way around. Alignment Prediction: I predict that administrative leadership will express more impact of their work on shifting the goals of the university than intermediary administrators. I suspect the consensus from administrators across the board will be that the impact of 10,000 Solutions was useful but small in effect.
- Organizational and political bureaucratic factors asserts that individuals and organizations learn in connection with their environmental context (Allison & Zelikow, 1999). The interview questions for this proposition are: [a] Are there

aspects of the institutional culture at ASU that helped with this project? Other aspects that made it difficult?; [b]Were there examples or individuals outside of ASU who influenced this project? Are there things that were happening within ASU that influenced this effort? Concept Prediction: I anticipate that administrators will find the institutional culture of ASU to be a driving force in their work, experience running the innovation effort, and how they evaluate their experiences. Regarding influential people, I predict that internal organizational individuals will be more influential than external individuals. Alignment Prediction: I anticipate that administrators will articulate this collaborative management of 10,000 Solutions as a result of the institutional culture of ASU.

- Transformative learning includes evolving practices and decisions lead to a transformation of the individual making decisions within an organization, or the organization itself (Mezirow, 1991). The interview question for this proposition is: Has the management of your platform changed the way you think about innovation and collaboration at ASU? If so, what changes do you see in the future? Concept Prediction: I predict that administrators will articulate a more sophisticated understanding of what is necessary to manage an open innovation effort within an organization. In particular, they will emphasize the complexity of management of such platforms and programs. Alignment Prediction: I predict that intermediaries will express a deeper understanding of their own mission in their department resulting from the experience gained from 10,000 Solutions. I anticipate administrative leadership will articulate evolving understanding of using participation activities like 10,000 Solutions to connect with the student body.

Data Preparation and Coding

Data for this project was collected through interviews of administrative leaders and intermediaries at Arizona State University. Administrators were interviewed in two rounds; the first round of participants were known to the researchers from collaborations and interactions over the past five years at the university. The second round of interviews was another set of related administrators identified through snowball sampling. There are fifteen interviews included in the concept analysis, the total number of interviews conducted for this dissertation research. For the alignment analysis, ten of the fifteen administrator interviews were included. A subset of the interviews was used because these ten individuals were directly involved in the design, management, and evaluation of 10,000 Solutions. Any analysis of administrator alignment will be more accurate and insightful if the project in question is the same for all responding. The confidentiality of respondents was ensured through the use of a random respondent number during the transcription review process, with the corresponding key saved in a separate location. At the time of analysis, the transcript documents were uploaded into MAXQDA qualitative software (MAXQDA 12.1.3, 2015), and the respondent key was destroyed to protect the identities of respondents.

Coding for this project was built primarily around the theoretical concepts outlined above. Each concept had a corresponding interview question, and therefore a corresponding code. Table 2 has the coding system used in data preparation. For the purposes of the alignment analysis on the 10,000 Solutions collaboration, it was necessary to know the role of the administrative respondent. Eligible respondents were coded according to their organizational role and staff role. That means an administrator was either a manager or staff in a leadership department, or a manager or staff in an intermediary department. One

additional administrator code was included- that of the external consultant involved in the technical management and redesign of 10,000 Solutions.

Table 2.1 Concept and Administrator Codes

Values	Teamwork	Culture	Administrator
Organizational outcomes	Past experiences	Double loop learning	Manager - leadership
Governing variables	Skills match	Organizational, political, bureaucratic factors	Staff - leadership
Action strategies	Interoperability	Transformative learning	Manager - intermediary
Satisficing	Organizational learning		Staff - intermediary
Single loop learning			Consultant
Consequences			

Analysis of Design Stages Responses

Organizational Outcomes

Concept. There were three categories of responses regarding organizational outcomes. The first category of responses was on substantive objectives. Of particular interest was the use of ideation and engagement of students, faculty, staff, and the broader community to make an impact in the world. These goals are consistent with the aspirations of the New American University, as well as a need for new cultural values and practices, which is consistent with the concept prediction. It was very clear that administrators understood their efforts were part of a larger effort within the university. The second category of responses was about innovation. The goals articulated above are very connected with university innovation, particularly if the New American University is positioned as an

innovation in higher education. Administrators largely spoke to the influence of innovation as a major organizational objective.

> I think one of the important things we've learned is that one of the reasons we have been able to be successful because entrepreneurship and innovation are an institutional value and not a value held by one or more departments but infused without.

One example of this commitment is multiple departments, interdisciplinary groups, and collaborations being formed that are innovation specialists located in intermediary departments. This was both to rapidly expand the breadth and depth of innovation practices, and also to remove this burden from other administrators in the university who are responsible for other core functions. In the context of the New American University, departments are getting new identities as master learners of innovation, much like students are being challenged to become master learners of engagement and impact. The final category of response was skills needed to realize such goals. It is important to note that these skills were articulated as objectives. In particular, administrators wanted to strengthen individual and department capacity, fuel efforts through acquisition of specialized resources, inform the community about these efforts, and use new and evolving technology practices to achieve the primary objective of ideation and engagement through innovation. From these findings it is observed that genuine organizational commitment can be measured through the reorganization of department structure and the acquisition of professionals whose primary focus is creating open innovation projects on a regular basis within the organization.

Alignment. It was predicted that the organizational outcomes would be slightly different for each administrative group within the university. The analysis shows there was

more consistency than anticipated. Every university administrative group noted that the role of 10,000 Solutions was to experiment with an online platform that is used for ideation, community engagement, entrepreneurship, and collaboration. A second shared theme that was that 10,000 Solutions was an effort to change the culture of the university to better reflect the organizational goals of the New American University. Administrators of all categories knew there was organizational support for endeavors like this platform. The leader managers had a bit of a broader view than the leadership staff or the intermediary groups when articulating what 10,000 Solutions was to accomplish in that it was couched as one of many investments experimenting with innovation and entrepreneurship using grant resources. The data confirmed alignment within department groups, as predicted. This was particularly notable for the research team who included the shared objective of the other groups regarding engagement and ideation, but also specifically reference participatory action research, and study of how individual use a platform of this nature. There was one outlier in organizational outcomes, which was the response of the external consultant. There was no mention of the substantive objectives of the platform; instead the consultant said the purpose of 10,000 Solutions was to deliver video based solutions for people to deliver content. This response was very out of alignment, indicating that the contractor was deeply out of touch with the goals of the platform.

Governing Variables

Concept. The governing variable is an articulation of the values being promoted through university programming. The responses to this interview question from respondents were smaller scale pieces that built up to the design principles of the New American University. This is articulated in two ways; the first articulation being that of skills that the

university community is intended to achieve. To say that action is a theme in the interview responses is an understatement, and strongly confirmed the proposition for this concept. Values promoted for students are continually ideate in innovation and entrepreneurship efforts. Ideas are not the only objective, but to ideate as part of a community, to build on ideas, and translate ideas to action. A missing piece in responses was discussion of an evaluation guide for measuring action and impact that took place following participation. Such an evaluation guide could be present in university operations, but was not present in interview responses. There also were not specific discussions of how successful actions resulting from open innovation participation are shared across the university. Individual characteristics that are to be strengthened through experience participating in open innovation is to create an identity of problem solving agency, with knowledge that student voice an action can have an impact on real world problems immediately. Almost every respondent mentioned that optimal participation at the university should be both broad and diverse, and participation should increase individual capacity for future engagement.

> We really valued that ideation was a good habit, a good muscle to flex, and it isn't something we do naturally, it's not a process that we do. Ideating and publishing is even more impactful. I think that it spoke to the notion of lots of us can sit on the couch and have ideas about things. The difference between that person and the social innovator-entrepreneur is the person that says "I'm actually going to do something about this." I think the strong value was that first step which was so important. Then the notion is that there must be other things that come to bear in partnership with the idea to help people move the idea to the next level.

A valuable insight from the governing variable responses was that it isn't enough to promote the values of the New American University at the individual level, but that this cultural and structural shift must take place at the organizational level as well, "The strategy was that we made innovation a prime objective; we made innovation more important than tradition." This was a dimension I had not predicted above, but there is a clear differentiation about what must take place at the organizational level to make the individual level possible. There are multiple references to the leadership of President Crow being instrumental in making this change happen at the organizational level, such as breaking up traditional academic departments to create transdisciplinary schools. The university takes an aggressive approach to supporting applied innovation through the experimentation with a variety of projects and accepting that not all will be successful, which can include accepting ideas from partners and donors outside the university system. Access and diversity of the university population is a guiding principle throughout the university efforts. There are also indications at the university level of creating resilient and active learners, and consider a successful student experience to include academic achievement, engagement, and interpersonal skills.

Alignment. The governing variables responses were consistent with the outcome objectives, as predicted. There were also indications of increasing specificity between the administrative groups regarding what behaviors and actions would emerge from participants who used the 10,000 Solutions platform. Echoes of inclusivity, ideation and collaboration were present in these responses from all internal administrators. For instance, all four administrative groups discussed that participation on 10,000 Solutions was intended to be broad, and to challenge people who may not have engaged in ideation like this before to participate. The choice of broad participation versus elite participation has a substantial

impact on the outputs of participatory platforms. The majority of the time broad participation lends itself more to breadth of ideas, but not necessarily ideas with enough depth to be implemented without collaboration and revision. The research team of the collaboration had experience designing platforms for both types of participation, with 10,000 Solutions being the broad design and the Policy Challenge, a collaboration hosted by the White House, had narrow, expert participation. The following quote from a manager in a leadership organization best articulates the responses from administrators:

> 10,000 Solutions in my mind was meant to focus on this (wide) part of the funnel, the opening, showing that all of the ideas that come through the funnel have value, and that as a university like ASU, with so many students, we can't afford to just do a trickle model where we congratulate ourselves and a few people a year on becoming entrepreneurs. We need to figure out how to celebrate this entrepreneurial identity of all of our students. So if all of our students are going to project an entrepreneurial identity, the thought was like, "Well, what if every single one of them had an idea, and they posted it on this platform, and other people engaged with them on it?"

Broad participation was also paired with broad choice on the platform itself; in this way 10,000 Solutions differed from the majority of participatory platforms in the field at that time which tended to only invite participation in response to organizational challenges or asks. Here two organizational values are beginning to be articulated that became design choices for the platform. There were no barriers to eligibility for participation on the platform. When described by administrators, 10,000 Solutions participants could be anyone, at any age, living anywhere. Instead of narrow challenge prompts, the initial design of 10,000 Solutions relied on eight broad challenge categories that people could post about. This was

an area where, from an operational point of view, the external contractor was more consistent with the governing variable response; the task at this level for the design company was to provide a taxonomy for participation that included fields, categories, and the ability to post video content. Responses from intermediary staff respondents gave one more detailed design feature, which was the goal of including feedback to improve ideation and advance ideas closer to a state for viable implementation.

Action Strategies

Concept. The design in action strategies is where the organizational outcomes and governing variables come to life in practice within an organization, consistent with the concept proposition. Action strategies can be categorized in phases. First comes the context of the actual activities themselves. Respondents noted that contextual prompts for participation tended to closely reflect the governing variables; there was a push for innovative ideation with the potential to be applied to address real challenges facing different communities around the world. Many contextual prompts pushed participants to engage in systems thinking on a broad level, though participation for many of these ideation activities tended to be smaller ideas fitting within the contextual umbrella of the effort. Participation tended to be broad rather than deep in these early practices, though over time there are indicators of heuristics that can deepen participation, such as providing resources like funding opportunities, training, and mentoring for participants. Second, is the presentation of the interface that participants use. A core starting point in design is ease of entry, so participants are focusing on the substantive challenge at hand rather than the operations of the program or platform. While many efforts managed by administrators took place in offline spaces, online platforms introduced hybridity into open innovation participation.

Three types of hybridity were identified. The first hybridity arrangement was unintentional hybridity, where activities were happening online or in physical spaces without intentional design and little connection. The second hybridity arrangement, the most prevalent for the majority of efforts in this analysis, is segmented hybridity. Segmented hybridity is where there is participation in online and physical settings that are related to the same topic, but have different roles and functions in the process. An example of this would be a participatory platform where participants post ideas online, then there is a physical event to discuss or judge the ideas. The third hybridity arrangement is fluid hybridity, which was evidenced in the redesign of 10,000 Solutions. In fluid hybridity, participation is meant to seamlessly move between the physical environment and the online platform without the requirement of a culminating event. This finding of different levels of actual integration of online and offline environments, particularly the unintentional hybridity arrangement, is supported in the forthcoming work of No, Mook, & Schugurensky (Forthcoming). They found that in a city-initiated participatory process there was very little connection between online discussions and face-to-face meetings; very little discussion included from offline meeting discussions in the online discussions, and no discussion of online discussions in offline meetings.

Insights on judging and lifecycles of projects were prominent among responses. Administrators were willing to experiment with their programming to increase broad, diverse participation. For example, in one innovation event judges were primarily older white males. The department managing the event had not thought about the gender or race of judges during the first planning activity. During the event though, the administrators noticed this lack of diversity and wanted to expand the diversity. The team intentionally made judges

more diverse in their next event. By making judges representative of the student population in the university, participation of females increased substantially. The inclusion of more female judges, specifically 55% as is consistent with the female student population at ASU, female participation increased from 12% to 27% in the next participatory event. While the administrator clearly felt there is a relationship when discussing this program change, there is no way to determine the causal relationship from the information provided in the interview. The phrase "next participatory event" is relevant. Iteration is extensively used as an action strategy. Administrators identified iteration as a valuable attribute by university leadership, as noted in the motto "Design. Build. Reassess. Continue." Many of these efforts at Arizona State University were cutting edge programming from around the country. The novelty of these efforts meant that administrators did not always know what was needed during the first design iteration, making redesigns important for effective programming. In addition, feedback from administrators and participants enabled administrators to advance design of their programming to better hit the core of the department mission. There were some cases where administrators had to learn through experience that a standard planning and execution phase would not be sufficient for open innovation implementation:

> Our whole notion that this whole process was linear was just faulty. It was a false assumption that we made initially. We started to realize that wasn't really the case. In hindsight, I don't think we knew this at the time when we were struggling with it.

There were challenges associated with iterative design and planning, including initial design "stickiness" where people in the university had a difficult time remembering the new objectives or a project or platform, and administrators had to continually discuss design

changes. Effective iteration requires resources, and the lean resource nature of the university meant administrators sometimes lacked resources to invest for an effective redesign.

Alignment. The action strategies question got administrators to explain the design of 10,000 Solutions. All but one of the administrators used this question to address the original design of the platform. The exception was a respondent who became involved late in the management collaboration. The preliminary design was open in design, login, and posting requirements. As mentioned above, the only guidance for participation topic were eight thematic categories for ideas including education, technology, communities, sustainability, economy, health, human rights, and discovery. The ideation field had enough space for a few written paragraphs, with an option to post a short video to accompany the post. Users could like ideas or build on ideas. The purpose of builds was to start momentum on moving from ideation to action, "There was an initial hope that there would be these chains of ideas that would carry along, and communities would organically form around different notions, ideas, concepts, and then participants would start working and developing the idea even further." The front page had previews of featured solutions. A design component with a "sticky" legacy was a $10,000 grand prize for one idea that was posted on the platform. The intermediary administrator used the term sticky because it was difficult to change the branding of 10,000 Solutions after its preliminary design, and the grand prize was an essential component of that design.

One component of an action strategy is how these designs were made possible. Part of the funding was given for the 10,000 Solutions platform development from Arizona State University provided from a grant from the Kauffman Foundation. Another funding source was secured by the interdisciplinary research team that formed to study 10,000 Solutions:

> We ended up being the first ever National Science Foundation rapid grant given to something that was a non-emergency situation. The criteria for receiving a RAPID grant are 1) Does it need to be timely? 2) Does it need to be done sort of immediately? and 3) Is there a reason that this cannot wait for six months down the road? Our justification was that we were at the very early stages of what we believed would be a multiple year project. If we can get involved now, we can look at the evolution of these platforms over time, we can look at lessons learned, and we can look at how different groups understood what the challenges were.

The procurement of outside funds for innovation experiments like 10,000 Solutions are helpful in that other university departments and programs are not vying for the same funds. It also indicates that administrators who volunteer or are tasked with running open innovation projects need to be prepared to secure outside funding.

10,000 Solutions was never intended to be an online suggestion box. Though simple in design, there were features, like builds, intended to generate collaboration and forward motion of ideation and action. At the same time, administrators were using their physical staff, spaces, and events to generate continued participation and action. The first design iteration of 10,000 Solutions can be labeled as segmented hybridity. Segmented hybridity is where there are connected activities that are taking place online and in the real world. One intermediary leader and one intermediary staff from different departments spoke about using hybrid strategies to move ideas towards action, or at the very least idea advancement. One example of early hybridity efforts was the physical gathering for the award of the final grand prize. Another example is hosting 10,000 Solutions related events to get online participants together in the real world. There were small instances of idea application that were both

encouraging and frustrating to administrators. Encouraging, because these examples hinted that the participatory ideation being discussed was possible. Frustrating, because there was not many of them, and no causal link between online participation and real world action:

> One of our change agents who would always introduce 10,000 Solutions to people who came into the space loved to use this example. He himself had published a video about recycling electronics, I think he specifically said batteries. His solution said he really valued sustainability and knew that throwing batteries in trash was a bad thing, but on campus there was no place to recycle batteries. He, like other people, had a drawer full of dead batteries just sitting there because he didn't know where to take them or that location wasn't convenient. He tells the story that he published that video, then he was approached by one of the facility managers here at the Memorial Union, and that person at the time was doing a grant for sustainability practices within the MU. I don't know if it was a direct result of the video, but they got to talking about recycling electronics and it came to pass that we were awarded a grant to recycle electronics including batteries. The station for recycling these things sits outside Changemaker Central. This change agent loved to say "Here's my video" then showed his video and would point to the recycling station, then say "This is a story about how this works". I think those stories were not very common, and I also don't know how much causality was truly there."

The uncertainty of causality was an area of frustration for intermediary administrators in particular. They wanted to demonstrate that the ideation on the platform was leading to action in the university, and there was simply no way to know for sure.

Satisficing

Concept. Satisficing is a challenge for any organization or individual at times, but the pace of work at Arizona State University pushes administrators to design and launch their programming quickly. The theme of fast movement was pointedly discussed by all respondents, with an emphasis on the organization having a "consistent sense of urgency." Time frames for planning and research span, on the long end of nine months, with other projects only having a few months of preparation before being launched. There are times, either by choice or by assignment, when a team moves rapidly through the information gathering process to move on a project in development. Meetings, collaborations, and teams are purposely formed with pressing timelines to force rapid iteration. While the rapidity was included in the concept proposition, there were department level strategies and individual characteristics that were in play in gathering a foundation of information before launching an open innovation effort. In other words, while administrators noted that the sense of urgency and fast pace of work lead to successes, there are times when moving quickly means leaving important perspectives or groups out of project planning processes. There are some times when moving fast is a liability. There is a counterpoint finding to the sense of urgency, which is making sure the speed of the effort is not out of pace with the university.

> Entrepreneurship tends to attract a lot of people with big ideas and like ideas, and it can be hard at times to focus a team of really creative individuals who want to try new things and want to move really quickly that there's a chance that, there's a little bit of group think that everyone in this room and on this team can move really quickly and want to see progress and success immediately. That can be out of pace with the rest of the institution. Operating as a startup with a highly enthusiastic and energized team that still has to work within one of the largest public universities can

> be a challenge at times. I think the lesson learned is that a good idea that is pursued too hard or too fast no longer becomes a good idea. I think a good idea only fits within the context of where it's applied. There have been some projects where we tried to do something too quickly without institutional support where that project has failed, not because it was not a good idea but because the team pushing it was so enthusiastic and they pushed too hard and too fast to build enough support

The quote above has a connection to the Abilene paradox, where groups take action that is counter to preferences of the larger community or collaboration (Harvey, 1988). Whether action is intentionally taken that will make other administrators uncomfortable, or if the discomfort is not caused on purpose, a mismatch of pace and actions taken can lead to difficulties within the organization.

The strategies noted by administrators regarding satisficing were consistent. First, understanding the context of what the program or platform was supposed to accomplish was important, both in terms of within the university and in the broader community. Boundaries have to be established around the program design phase so that the research and learning taking place goes specifically to the issue, question, or challenge at hand. There is research of other groups doing similar work, whether that be other research, market practices, or examination of existing code in the context of an online platform. The use of student input is a valued information resource in the planning and design phase of many projects. In some cases, student input can include allowing the student government to make decisions about fee increases in order to realize the objective they want to achieve. Student input was included in some projects, such as 10,000 Solutions, but the students involved in the design process of the platform were not the students that managed the platform.

An individual's personality has influence on how much research goes into a project. Personality matters in a discussion of creating operational changes and programming in an organization based on a philosophy of open innovation. This is a challenging adjustment, and cannot be done without persistent work of administrators. Respondents self identified themselves and their teams as a mix of quick start iteration tendencies and thorough, theory based research tendencies. Some offices capitalized on these personality types, purposely pairing a quick starter and a thorough person together to create a balance of foundational information. Another personality trait that was important was individual initiative at point of entry into an effort. This was especially important for administrators that joined a project once it had been underway for a year or more. There was a decay function in the amount of information foundation provided to new administrators. Administrators that are involved at the outset of a project understand the goals and know the choices made in planning the project. Administrators that join an effort once it is well underway do not have the benefit of experiential knowledge of the project's foundation. While the original administrators may explain the procedural steps to working on a project, the contextual background of the project and a comprehensive explanation of the choices made to that point may not be shared with the new administrator. Without independent research about the projects the new administrator would have a substantial gap of information about the project.

Alignment. Satisficing is phrased as research and learning that took place prior to the execution of 10,000 Solutions. It was predicted that intermediaries would have more to discuss in terms of satisficing efforts. For the first design iteration of 10,000 Solutions, there was a contradictory result from this prediction. Administrators from in a leadership department had primary responsibility for the preliminary design of 10,000 Solutions. This is

not unsurprising in a collaborative partnership and the categorization of administrative leaders and intermediaries. This staff administrator in a leadership department served as the primary designer. As discussed earlier, the research team joined the collaboration several months into the planning process and was able to contribute some input to the preliminary design.

As mentioned earlier, 10,000 Solutions had three primary administrative groups, with one external contractor. All had unique satisficing tasks. The Office of University Initiatives respondents reported approximately nine months of planning. Their preparation included market research, but more emphasis was placed on planning meetings and email conversations. The market research was on existing ideation platforms at the time like OpenIdeo. The research team did background research to articulate the contribution of their role in the management of 10,000 Solutions and to receive the Rapid grant from the National Science Foundation. The substantive areas of research in this instance were about trajectories of participation, and experiments with information display and subsequent changes in participation. The external contractor took the original code for 10,000 Solutions that had been developed by a staff member at the university and moved it to a Drupal platform. Their satisficing efforts revolved around looking at the platform architecture, then finding existing code and creating new code that would make the platform operational. The contractor noted that their time was spent time researching the security issues that are common with an open platform of this nature. The Changemaker department joined the collaboration after the first design iteration of 10,000 Solutions was complete and the redesign underway. Their responses about satisficing were about gathering user experience and feeding that information back to the collaboration to improve the platform. The

benefits of having partners in a collaboration have different satisficing tasks; diversity and specialization of skills is one of the assets of a team like this. However, if administrators only know the satisficing requirements for their part in the collaboration, that means there may not be a strong understanding of what the other groups are working on. In other words, potential for misalignment.

It was noted that Changemaker was formed around the same time as 10,000 Solutions, and the platform was included in the department's organizational structure. As Changemaker matured and evolved, respondents found the structural orientation of 10,000 Solutions "sticky" to change. The university population had a hard time understanding the new objectives of the platform in the second year. Though the Changemaker administrators continually discussed what the new objectives of 10,000 Solutions was, they were regularly reminding people in the university that there was no longer a final grand event at the end of the year and no grand prize, and that participants could now post more than ideas.

A shared theme for the internal administrators was that a challenge of researching participatory platforms came from their novelty in the field. When an effort is on the cutting edge of innovation, there is higher uncertainty, ambiguity and need for experimentation. The complexity of satisficing is increased in a collaborative effort where every group has distinct roles and skill sets. There are two insights that emerged in satisficing responses about horizontal information sharing across the collaboration, and vertical information sharing down the departments over time. In retrospect, these can be considered satisficing challenges. First, because every group in the collaboration was working so hard to fulfill their own minimum satisficing requirements, there were some times when cross-group sharing of

that satisficing didn't make it all the way down the department staff. This was not intentional by any of the groups, but it did occur:

> I don't think I understood at that point, or the students understood at that point, how unique 10,000 Solutions was. I don't think they understood the context that platforms like this were being experimented with in different places with varying degrees of success, and it's very hard. I think they struggled in ways that in retrospect made sense, but I don't think that they had the larger context to understand that their experience was not an uncommon struggle. Their experience was very similar to other experiences with platforms. Questions like sustaining participation, and building community, and building a critical mass, and moving from prescribed participation to ongoing participation were present. as they were struggling they didn't have the benefit of understanding they were struggling with some of the same things that people with PhD's were struggling with. In hindsight, I don't think there's any way we could have known anything different than that.

Second, over time there was an increasing need for providing background and operational information about the platform to new members of the collaboration. With the exception of the primary administrator who designed the platform, every respondent spoke about their effort to learn what had been done to that point to best fulfill their role:

> For the overall orientation, I would have provided the basics about 10,000 Solutions as a broad overview. For the first 10,000 Solutions committee meeting, these are the students directly involved weekly with developing 10,000 Solutions. I had developed a good understanding of the site's strengths and weaknesses. I gave them a lot of the same information as what I'm telling you. I wanted to make sure my team had the

> history and background as the chair, since I wish I could have had that when I started. I covered what we had tried already, ideas that worked and ones that didn't. I also gave my first thoughts of where we could go with the program and the general timeline. I also gave new members the basics about how the platform worked.

While unsurprising, an insight regarding satisficing for an ongoing collaborative process would be to take extra effort to share information across groups in a collaborative effort and within a group to reduce the chance of lack of shared context, history, resources, and goals.

Single Loop Learning

Concept. Respondents had substantive insights to share single loop learning, many of which focused on change. For instance, when it comes to designing a program or platform, respondents spoke about how the organization changed their original iteration to better fit the objective or to expand what the program does. This includes increased influence from the community, increased complexity, counterbalanced by the driving need for basic functionality to realize any of the changes. Some insights were future oriented, such as thinking through how to move ideas created through programming towards action, such as getting ideas to administrators that could act on them. Choices were made, such as the removal of a monetary prize, resulting in consequences, such as addressing confusion from potential or active participants throughout the university. Another resource related response was an insight that if a project is being passed from one managing group to another, the project may fare better if some monetary or staff resources are sent along with the project. A prominent response made reference to the lack of understanding of the financial resources that are needed to make a successful project.

A different insight on single loop learning was the importance of leadership from the organizational head. The leadership of Dr. Crow was specifically noted by eight of the fifteen respondents; not just his thoughts or evaluations, but his actual attendance at meetings with students and administrators. This is indicative of the influence that a leader can have by giving time and attention to the teams working on ideas. Co-creation with multiple groups was seen as challenging, but worthwhile for creating open innovation efforts with actual impact. The administrators working on a project with an external contractor universally detested the experience; lack of understanding, technical skills, and the conflict that arises from iterative design with a contractor that charges for each change was a substantial burden that contributed to the end of the project.

Alignment. The interview question for single loop learning was phrased to capture insights on designing open innovation platforms through the process of iteration. This question is interesting in that it asks people who were involved in the redesign of 10,000 Solutions to articulate what that redesign was intended to accomplish, and the changes that were made. It was predicted that intermediary administrators would provide more detailed insights about the needs of the first platform and the changes made to the second platform, which was confirmed in the analysis. Needs articulated by the intermediary administrators were the creation of more connection, community, and feedback. There were functionality issues that arose from bugs in the platform code that needed to be addressed. There was an interest to remove the large $10,000 prize that came from both a lack of sufficient resources to fund a prize of that amount, but also interest in experimenting with more civic or community oriented incentives. A similar wish from intermediaries was creating momentum for action through the participation on the platform. Some respondents in leadership had

different roles at ASU at the time of the redesign, and the inclusion of the intermediary teams enabled the leadership teams to spin the project off. This is what that office is designed to do. They were still aware of the changes, but these changes were not "owned" by their office in the way that intermediary administrators did.

The articulation of the administrative intermediaries showed high alignment about the design changes made to 10,000 Solutions. The platform expanded from hosting one type of contribution, solutions, to hosting solutions, challenges, and actions. For challenges and actions, participants could serve as a host or a participant. This was in keeping with the interest in giving the users as much control as possible for ideation, and social action. Participation was no longer limited to joining or supporting, but could also include leading an effort. An additional design addition was that of individual profile pages. Functionality additions like automatic notifications were requested, as tools like this can be effective reminders to return to the site. The addition of all these structural changes is an articulation of fluid hybridity, where action seamlessly moves through online and physical spaces without the constant need of a large focusing event. The biggest difference in alignment was the understanding of how the solutions, challenges, and actions were designed to be connected on the platform. The research team was involved in this design change, and served as the point of contact with the external contractor, so had a better idea of how that feature was supposed to work. Had those connections been designed effectively, the other intermediary administrators would have discussed this more, but as this feature never really came to fruition in practice, it never was prominent in their experience with the platform. The language around 10,000 Solutions was revised away from an ideation competition to an

ideation and social action platform primarily for the university community. The platform still remained open to anyone.

Some valuable insights emerged in this question about design changes. First, there were continued discussions with all internal administrators about what it meant to support bottom up ideation. The first design of 10,000 Solutions used a big financial prize to encourage participation; even with that large carrot there were not many repeat participants. Early participation numbers and programming suggests that the "if you build it, they will come" moniker is not necessarily true. In addition, administrators were seeing that there was a real need to have a better understanding of an issue, and more explicit design architecture to have more substantial ideas present. The intermediaries gained an understanding that the design and management of the platform was more complex than anticipated, primarily because so few platforms were trying to achieve the functionality of design that 10,000 Solutions was striving for with a group of administrators that had little or no experience or training in platform design.

Second, there were indications that administrators knew there wasn't a leader group of this collaboration, and there were always complimentary but different perspectives on what should happen with the site, who would pay for what, and what success and accountability means as a whole. This is not to mean there was fighting about the big picture, more that administrators were aware of the minor differences in preferences and no one that would arbitrate conflicts. One administrator noted that an example of this was that there was not an effort to get financial resources with all groups in the collaboration, but more that individual groups brought resources to the table. No one was upset that groups brought what assets they could, or that those assets meant that group had to fulfill certain

expectations with those monies. The following is a reference to the financial challenge of design iteration of a program like 10,000 Solutions:

> So we were all just taking our best guesses, at how this thing would work. Then I think, you know, we weren't flush with resources. So one issue with this idea of try, fail, try again, have a culture of innovation- I realize that some people hear that, and they say, yeah that's great when you're rich in resources. But when resources are scarce, and every time you want make a change you owe the vendor who's charging you x amount an hour, you have to do a cost-benefit analysis. So, I think that I felt resource starved at times. And I think that Changemaker felt that way in terms of staffing.

It should be noted that the other innovation efforts at the university tended to be event focused with participation happening in a finite window. 10,000 Solutions had more ambitious goals in becoming a permanent feature of ASU in its use of technology and creating an environment of continuous change. The difficulty in realizing the goals of the second redesign of 10,000 Solutions does not mean that the team wasn't on to something valuable and innovative.

Third, was that the misalignment with the external contractor was providing an additional challenge in creating an operational platform and realizing the design goals of the platform. Every single intermediary administrator specifically reference challenges that came with having the platform's technical team managed externally. For the context of the single loop learning section, a segment of discussion about back end changes needed in the redesign, and requests for changes for research experiments are included in Appendix B. The contractor did not feel the changes made were difficult, but the research team noted that the

contractor did not really understand what was being asked of them in terms of back end functionality. The insight from these excerpts is that hiring a web design company may not be sufficient to create a participatory platform, as there is technical functionality required that not every web design company has in house.

Consequences

Concept. Responses about the evaluation of success came in two areas. The first was about operational execution of the organizational objective and governing variable. Administrators whose projects were more straightforward had more positive evaluations of their success than administrators with more complex projects, consistent with the consequences proposition. The articulation of this evaluation dimension included the following questions:

- Did the program function as it was supposed to?
- Did people participate?
- Were participants satisfied with their experiences?
- Was any real world action generated from participation?
- Did the program have enough coverage of the university population?

There was an acceptance of the possibility of individual project failures in the larger push for integrating innovation, and that part a leadership role at the university was to train the management team both recognize if failure occurred and to move on:

> We generally have a fail fast mentality which is an innovation and entrepreneurship mentality. You have to have the leadership of the organization be willing to accept that behavior. So, try something, and if it doesn't work, that's fine. Move on to the next thing. Don't worry about it, don't spend time analyzing. If it didn't work, it

didn't work- move on. You have to accept failure, and you have to have your leadership team embrace failure.

One administrator shared that while acceptance of failures is an espoused value of the university, failures are not as openly discussed in practice. This indicates that while acceptance of a project failure in the pursuit of realizing the goals of the university is not yet fully integrated into practice. It could also be an easy issue to address; additional feedback from university leadership to intermediaries could go a long way toward understanding how their project contributed to the larger work being done at Arizona State University.

A second dimension of evaluation focused more on the culture of ideation and impact within the New American University. One consistent metric used was if participants learned about a new form of ideation or action, and were more capable master learners. Administrators wanted to know if their programming enabled people to approach large, real world problems, not with the expectation of solving them completely, but either better understanding the problem or addressing a small component. There was an understanding that evaluation of a project can be mixed if it is managed by a collaboration of administrative departments, all with disparate objectives and success metrics. Finally, one metric of success was if any connections were made with new partners that could be sustained beyond the existence of any one program or platform.

Alignment. It was anticipated that administrator assessment of success of the 10,000 Solutions initiative and its consequences would be mixed, and that administrators with closer proximity to the management of the platform would have a more negative assessment. In general, this prediction held true. The leader administrators, both management and staff, had more general and positive assessments of 10,000 Solutions than the intermediary managers

and staff. Within intermediaries, the staff had a more negative assessment of 10,000 Solutions than their managers. Though that prediction held true in general, the assessment of consequences was much more nuanced. Given the complexity of managing 10,000 Solutions, the different success metrics discussed by the respondents was encouraging in their breadth and depth. It is instantly observable that participatory platforms are much more complex to understand, design, and execute than other online tools like apps or basic websites. One of the most frustrating aspects for administrators regarding 10,000 Solutions was that all of the insights and advances in practice are not captured if the assessment question is simply if the site works or not. The consequences assessment of 10,000 Solutions will be is organized by nine themes below including ideation, design, functionality, 10,000 Solutions impact, administrator efficacy, learning, research, partnerships, and innovation culture of Arizona State University.

1. Ideation - Ideation was a rather straightforward success metric. Administrators in all groups thought 10,000 Solutions to be successful in getting people experience with ideation. This was particularly true for the first articulation of an idea. Ideation refinement or builds was not as successful. The administrative leadership's original goal for 10,000 Solutions was to generate 10,000 ideas. While that particular number was not reached with the platform, the leadership was satisfied with the amount of ideation that took place, which was around 2,500 solutions.
2. Design - Design can be examined through the first design and redesign. Administrators involved in the first iteration of 10,000 Solutions thought the preliminary design to be successful. In particular the site was deemed simple to understand, clean design, and aesthetically beautiful. There were limitations in the

first design, but the administrators did not consider this a lack of success, as iteration was expected with this platform. The second design was done with a new, more complex goal of ongoing participation in a fluid hybrid environment. The assessment of the redesign concept was positive. Intermediaries were excited by the increased functionality that should have come with the additions of challenges and actions, profiles, and the improved functionality that should have taken place. A discussion of how functionality impacted the success of 10,000 Solutions is below. However, when being asked about the design concept and how it was implemented, the intermediaries noted that something was missing to realize the goal of ongoing participation and the creation of a new culture. Administrators were unsure exactly what it was, but responses ran along the lines of "a reason to participate was missing" and "participation alone isn't a good enough reason to continue participating." A design feature mentioned by many administrators that would have helped was a connection from ideas on the platform to university administrators. This was never put into action, but was very present in the minds of the people managing 10,000 Solutions as the next step.

3. Functionality - The functionality of the redesign was not successful. This was the biggest misalignment between the external contractor and the internal administrators. The contractor said the biggest success metric for them was if the platform worked. The response to this question for the contractor was yes; in particular the ability to post videos was mentioned. It was clear from the detailed responses from internal administrators that the contractor was not in touch with the project and dead wrong in his assessment. Technical functionality was missing in all sorts of areas, shifted the

attention of internal administrators from the higher level tasks of managing participation to making sure the platform worked at all, and ultimately led to the platform crashing. In particular, intermediaries noted that there was a tidal wave of spam that the contractor did not help with managing beyond putting a captcha on user sign in, notifications were never enabled, there was not an actual working back end to the platform as had been agreed upon, and the platform continually crashed to the point where it could no longer operate. While this experience is limited to this one instance with this one company, an insight into success metrics regarding functionality by all administrators was that for a platform of this nature, an external, out of touch contractor was devastating to the process and ultimate outcome of 10,000 Solutions. Administrative leadership respondents did not see the end of 10,000 Solutions to be a failure, more that it was part of an experiment, and at ASU some experiments endure and some do not.

4. 10,000 Solutions impact - The redesign of 10,000 Solutions was ambitious- creating a robust, ongoing culture of ideation about innovation, entrepreneurship, and community, moving ideas through to actions, and creating a state of fluid hybridity were participation seamlessly moves from the online to the physical worlds and back. Intermediaries had the strongest and informed opinion on this point, and the answer was that success was not achieved. They referenced quantitative, qualitative, and usage metrics to support this assessment. Participation did not flourish on the platform. There were far more one time users than repeat users. The build and connection functions were not utilized. Though there were occasional examples of an idea that was generated on 10,000 Solutions that were applied in the university,

there was no way to confirm if the idea posted on 10,000 Solutions was responsible. Multiple administrators wished that there was a concrete way to tell if ideas from the platform were the reason for changes in practice.

5. Administrator efficacy - An insight coming from this analysis is that a vital component for managing a platform like 10,000 Solutions is to ensure that administrators at all levels have a sense of efficacy for managing the platform. In the case of the Changemaker intermediary staff, respondents expressed lack of efficacy. Intermediary staff were not saying that managers or the larger collaboration did not care about their interests. They knew the managers understood their interests and frustrations. It was not a lack of care that caused this lack of intermediary staff efficacy. Rather, it was distance from the intermediary staff to the core of where changes were being made. This happened in two areas. First, student intermediaries were included in the redesign efforts, but it wasn't the Changemaker staff intermediaries who were given responsibility for training people to use the platform and driving participation to the site. Their team had great ideas that could not be realized in the second iteration of 10,000 Solutions. While their ideas could have been used in a future redesign, the platform crashed before that was even an option. Second, the Changemaker intermediary staff were on the front lines of seeing what worked and did not work from a functionality point of view on the platform. If something didn't work, they were the people to find it or hear about it. While unintentional, they were so many steps between them and the solution to the problem that making changes in a timely fashion was exceptionally difficult. Staff would tell their manager the problem, the manger would tell the intermediary staff of

the research team, the research team intermediary would then relay the issue to the external contractor. There was also limited control in what changes could be made directly by the intermediary staff. Though they became expert in figuring out work around solutions, there was severe disappointment and frustration with their lack of control,

> The ideas the students had for changing the website, or wanting to implement changes to see that value, we couldn't do anything with because we didn't have access to the website. Students would be so frustrated because they would say "I could do whatever I want. I could be as successful at ideation for 10,000 Solutions that ever existed, but as long as I don't have the tools to work with, I won't be successful. I literally had students look at me and say "You set me up to fail."

The insight for this success metric echoes the findings from King, Feltey, & Susel's (1998) concept of authentic participation; the intermediary staff need to be in the center of a collaboration, such as being one of the primary points of view included in decisions about the program or platform values, design, management, and evaluation, for a successful endeavor.

6. Learning - Learning was by far and away one of the most positive success metrics for 10,000 Solutions. All administrative groups agreed they learned a significant amount about managing a collaborative partnership, sociotechnical design, and implementing innovation. Another dimension of learning was that one successful use for 10,000 Solutions was as a learning tool in classes throughout the university.

7. Research - There were some research successes regarding 10,000 Solutions. A significant success is the understanding of managing a participatory platform, this dissertation being example of that work. There were successful participatory modeling experiments that took place with administrative partners to improve the understanding of participation dynamics. However, there were technical experiments that could not be executed due to lack of functionality needed from the platform. An example of this disconnect between the researchers and external contractor was included in single loop learning above.
8. Partnerships - Intermediaries and leadership administrators noted that partnerships with external groups were formed during the management of 10,000 Solutions. This project established university administrators as leaders in experimenting with bottom up open innovation. These partnerships included temporary collaborations, such as hosted challenges of the month, or more permanent collaborations such as the research team being invited to join the MacArthur Research Network on Opening Governance. Intermediary administrators in particular gained a great deal of experience by being a part of this 10,000 Solutions collaboration. The dynamic will be addressed in more detail in the interoperability section below. At a high level, administrators understood the challenges facing the team, showed empathy and trust with each other, and felt mutually accountable for the overall outcome of the project and having each partner group meet their individual goals.
9. ASU innovation culture - The leadership and intermediary administrators felt that the 10,000 Solutions effort was one project of many within the university seeking to

implement innovation practices within an organizational setting. To that end, the project was viewed as successful.

Discussion

There are three categories of findings resulting from the two analyses of open innovation implementation at Arizona State University. The first category of insights is focused on the upper most leadership of the university. The integration of open innovation into organizational practice is not a simple add on to existing operational structure. Arizona State University has made innovation practices an organizational priority and has been willing to make structural and staff changes to make innovation happen. Organizational theory and behavior discusses how leadership matters, and this was supported with my analysis. Administrators point not only to the language of leadership as being influential in their work, but to the specific person at the top and his team coming to meetings, integrating ideas into university programming, and taking feedback. One area of improvement from leadership would be more direct feedback and conversations with administrative intermediaries managing complex programming, 10,000 Solutions being only one example. Intermediaries indicated more disappointment and concern about the lack of success of the redesign than the administrative leadership did. A conversation about the contribution of complex programming would go a long way toward giving intermediary administrators confidence to be bold in their experimentation.

There are numerous practical insights resulting from these two analyses on the management of open innovation programming. I will not detail every insight again; instead I will discuss the bigger picture lessons that come from the detailed insights. First, administrators better understand that the design of a participatory platform or program does

not guarantee that participation will happen. Better understanding of the motivations of student participants and the motivation of participatory programming is needed; in its current form programming like 10,000 Solutions didn't push people into new forms of participation. Second, increasing the diversity of judges, together with other strategies like targeted outreach, may help to increase the participation of under-represented groups. Third, a missing piece in innovation programming is the ability to track and know if ideation on the platform or program caused action in the larger university. A related component is the ability to get ideas to administrators without overwhelming them; a working feedback system needs to be designed and tested. Fourth, doing a complete over haul and rebrand of a project is not the most successful way to iterate. A better strategy is to create a new program with a new name, and have administrators know that the two projects are related. Fifth, different open innovation projects have different levels of complexity, and therefore cannot be treated the same in terms of planning, time, and resources. Moving fast is an asset for organizational change in terms of open innovation. However, some projects with potential will not be successful if not given sufficient attention.

There are two unique contributions resulting from the concept and alignment analysis. First, is the detailed discussion of innovation specialists within an organization. The use of intermediary departments (note more than one) with innovation administrators is a novel and proactive approach to causing organizational change. If organizations really want to become more open, they need to be willing to invest resources in intermediary departments that can focus on that objective so other administrators are not overwhelmed. The use of intermediaries are indicative of a new component of organizations with a goal of using open innovation, and based on these results would be beneficial for effective

innovation implementation. Intermediaries with these unique skill sets and objectives will remain important even if all administrators become more skilled at innovation programming, if for no other reason than that is their primary job. Second, the research results identify three types of hybridity: unintentional, segmented and fluid. These are not just abstract concepts; the 10,000 Solutions case has concrete examples of what each hybridity arrangement looks like. Just because the second redesign of 10,000 Solutions did not achieve the goals of design does not mean there isn't something innovative and valuable discovered in that articulation.

Analysis of Teamwork Responses

Past Experiences

Concept. The training of administrators was both an asset and a challenge in open innovation practices within the university. Past experiences were an asset in that the university is primed for diverse collaboration where individuals have broad skill sets. In particular, administrators tended to have experience or training in the social sciences, such as public administration, community service, business, marketing, or program management. The one past experience that was lacking from university administrators, but present in the contractor, was technological experience. This lack of knowledge about socio-technical design was a challenge for administrators dealing with online or hybrid programming. There were administrators from two departments that had expertise in innovation and entrepreneurship. Knowing how to work in innovation is becoming a specialty skill. These results are consistent with the proposition of past experiences.

Administrators who manage teams were able to articulate some of the qualities they look for when hiring new people. In short, they must be able to not only survive but thrive

in the environment at Arizona State University. They are looking for people to be expert generalists, people are performers that can operate quickly. There must be a comfort level with ambiguity, and a corresponding ability to work independently to move projects forward despite that ambiguity, "If you are trying to introduce innovation into a mature industry, you better have a high tolerance for ambiguity." Finally, prospective team members must appreciate collaborations and have an understanding of how their skills compliment the rest of the team. A job call for an innovation specialist has a demanding set of unique skills that many administrators are not prepared for.

Alignment. There was high alignment among administrators regarding past experiences in that they appreciated and understood the diversity of experience of the collaboration, and understood their lack of experience in designing a participatory platform like 10,000 Solutions. The leadership administrators brought experience with conceptualizing and doing an initial pilot design of innovative projects. The Office of University Initiatives specializes in creating a variety of projects and then finding homes for these projects in different departments of the university. The research team had expertise in the study of online communities, bottom up collective action, and civic participation. Members of the research team were the only individuals with direct experience managing a participatory platform before, that being the Policy Challenge competition done in partnership with the White House. The Changemaker staff had experience working with student led initiatives, and creating substantive programming around social change and community engagement. Again, the external contractor was the outlier in terms of response to this question. They felt that their team already had the experiences needed to execute this project. The external contractor did have experience in basic web design and management. Regarding the needs of

10,000 Solutions as a many-to-many platform, the evidence presented above indicates they neither had the skills nor recognized that they were missing the skills needed to execute the project effectively.

Skills Match

Concept. The responses about skills matching were phrased much more in the context of what was learned through the experience of designing an open innovation program or platform, rather than having the more green administrators indicating more growth and learning. Respondents identified substantive changes about how to lead to authentic participation and collaboration in their individual efforts. These changes were encapsulated by the need to improve genuine listening and communication with platform participants, the need to integrate feedback to make the platform or program more genuine, and to embrace partnerships:

> The skills needed were the ability to listen to the users and what their needs were of the platform. If the platform the users' needs, it isn't a relevant platform for us. The ability to listen objectively, remove one's self from the platform, to be able to take feedback in an objective way, and then be able to work with our partners to incorporate that feedback into a redesign.

Sometimes establishing partnerships meant that one partner had to be willing to take on the risk of experimentation and a willingness to share or give away success to make other partners willing to engage at all:

> Being a good partner, often times the role of our office feel like we go to partners and say "Let's go do this thing together and if it fails we will say that we were the

> ones that failed. If it is successful it's your success". That gives a lot of freedom to other departments at the university.

This is another indication that failure and experimentation is still not fully integrated into practice. Two of the intermediary departments that specialize in innovation programming noted that other administrators both admired them and were afraid of them. This is a benefit of having innovation intermediary departments. They both understand innovation programming and can take on the perceived burden of failure, which has the effect of increased experimentation throughout the university.

Another instructive skills match finding was about managing student administrators in bottom up projects. While this finding is in the context of university students, when dealing with the ambiguous nature of innovation integration, it is going to be valuable advice when managing employees in several different sectors:

> You must engage students in a certain set of assumptions that are givens, "These are the given expectations and outcomes, and to a certain extent you don't have the freedom to redefine those." At the same time you must balance a certain degree of freedom to design something that makes sense to them within those parameters. That's an additional layer that made it even more complicated.

When discussing skills matching, there incorporation of those with technological skills were important to respondents. As noted by the accompanying quote, this does not just mean design know-how, but also how technology fits into programming, and how the online and real worlds fit together:

> There is a hard-core skill set around technology that we just didn't have in house. I think you have to be nimble, if something breaks you have to be able to fix it right

> away. You need someone as part of the team who has technical skills. That goes without saying. The other part of it is you have to have this really unique skill set to think about the interplay between the face to face interaction and the virtual interaction. You need a perspective of the appropriate role of the virtual interaction. The virtual interaction is an outgrowth and manifestation of something else. You don't necessarily have to have the programming skill set, but you have to have a very good leg in both worlds. You have to have a skill set to know how to facilitate interaction and how is that translated into a more virtual space.

A takeaway from this discussion of technology, is that the management of sociotechnical systems requires knowledge of function and content. Knowing how the online tool works and being able to fix problems quickly is essential. It is also only part of the task. The other part is knowing how technology fits into and advances open innovation programming.

Alignment. The prediction for skills match was correct in that intermediaries provided more information about the skills needed to manage 10,000 Solutions. Intermediary administrators pointed to the lack of technological skills being a limitation for effectively managing the platform themselves. They also spoke about the skills of management including knowledge about participation, online tools, the use of hybridity to advance an idea, and tapping into the skills of the partners in the collaboration. However, there was a second articulated response from all administrators in this section, that being why the three groups in the collaboration were a good fit together. Each member of the partnership explained why the skill sets of the others helped advance 10,000 Solutions.

One of the challenges faced by internal administrators was trying to realize the design aspirations in the platform. It turns out that managing expectations for what can be

achieved in one iterative redesign is an important thing to know for administrators going into a project like this. This insight from the external contractor was the most insightful and constructive about the challenge of managing expectations when designing online sites for clients:

> Preplanning and giving adequate time to have issues throughout your development process is the two things that help any project. I think people tend to say "Okay, well we came up with all this stuff now go make it." They don't put enough time into giving adequate cycles. Things take a lot longer now than they used to because of the expectation of functionality. We now live in a YouTube/Google world. You get Google Docs, which is absolutely amazing as a tool, for free. Clients expect functionality of everything, including API's and everything to work just as great as something like that, which probably costs, I don't know, $2 billion in reality. That is also thousands of man hours to make it even what it is now, and this is version 25. You know, version 1 was super lame. So, you know, that expectation though from people developing things now is that it should be just as good as something from Google.

The input from the external contractor demonstrates that administrators need to understand the limitations of their resources, including time, staffing, and funds, when planning a hybrid open innovation platform. This speaks again to the need for combined understanding of technology and programming capacity with set resources.

Interoperability

Concept. As predicted above interoperability is a contributing factor to the success or failure of a project or partnership over time. Open innovation at the administrator level is

a study in relationships. Respondents needed to understand the landscape of administrative partners, being able to communicate, collaborate, and trust each other will be a significant contributor to whether an innovation effort thrives or dies. Negative politics or disassembling was highly unwelcome, and thankfully, not present in these interviews. The majority of respondents noted overall positive experiences with the genuine efforts put in by all partners:

> One of the things I enjoy most about working in the environment of Changemaking is the openness that people will bring to the table. They will leave pretense behind to come together in a unified way to solve something. That is renewing for me.

There were different insights on interoperability depending on if the partnerships were innovation focused departments or if they were multiple department collaborations. Within departments, online task management tools like Asana were helpful in collaboration and coordination. There were assumptions that everyone in that team needs to bring their minds to every meeting and not only think about their own project. These departments tend to embed their staff throughout the university to better understand the university. There are times when the innovation departments had to resist the quick start solution methodology to expand the breadth of a program or project:

> There was not a clear organizational chart between the managing groups. There was at times much confusion of who was responsible for what aspect, and who was accountable for different elements of the participation, design or execution. In general, there was responsiveness, there were positive attitudes toward each other, but there wasn't the sort of activities and events that were necessary to make sure that everyone was on the same page. Each of the different groups had activities sort

> of on their own, where the other partners were not attending. And making progress within different areas where there wasn't sort of a common awareness of what was happening between all the groups, which might of led to miscommunication or challenges down the road.

Collaborations were indicated across the board as an increasingly common and expected form of work. Respondents with experience in cross department collaborations indicated that there was a need for both shared objectives, and shared understanding of how the groups work together. If that piece was lacking, challenges arose:

> With great opportunity comes great responsibility. When given the ability and opportunity to see the entire system and influence an entire system, there's a lot of responsibility in doing so in a way that is fair to all those involved. A lot of universities partner with a business or engineering school and they deliver quote unquote university wide programming, but it's really under the guise of a business or engineering mission and vision. One of the things we've learned is even if we think we are going to primarily partner with the business school, we should open the dialog up to the other colleges and schools because it will likely inform it. Instead of doing one off deals with everybody, everything is a community conversation. It may be slower, take more time, and be messier, but what comes out the other side is stronger program that has more support, lasts longer, and there are fewer flashes in the pan and long term investment with multiple people buying in.

This quote is illustrative of the double-edged sword of innovation programming. On one hand, administrators attribute part of Arizona State University's success at being a leader at open innovation implementation to the hurry up mentality of programming. The lethargy of

organizations is seen as a standard way of organizational operations that the university is trying to combat. The rapidity of Arizona State University is an asset. The counter point this quote addresses is that a one size fits all approach and speed is not appropriate for all programming that is taking place at the university. More complex tasks do require more time and more resources to be successful. The discussion of 10,000 Solutions in the alignment analysis is a demonstrative example of a project that requires this extra time and extra support.

Any gaps in information, delay in responsiveness in communication or making programmatic or technical change will quickly and effectively damage the success of an innovation effort. One particular recommendation was that if one is using an open innovation platform, it is highly important to have the technical team in house and part of the core design and management leadership. While the instance of using a contractor may be unique to this case, every university respondent involved in the project specifically reference how damaging the contractor was to the viability of the platform. In an instance where a technical company was hired by contract, the ability to successfully design the platform and make necessary changes ultimately led to the collapse of the entire effort.

Alignment. Interoperability is really an examination of partnerships, and in the case of 10,000 Solutions management that means the collaborative partnership of the Office of University Initiatives, the research team, and Changemaker Central. There were three predictions, and all of them were verified through the data. The partners in the 10,000 Solutions collaboration valued and appreciated each other. Referenced more than once throughout the interviews was appreciation that each group took on extra responsibilities outside of what they could have to make the platform successful. In particular, the research

team took responsibility for the redesign efforts with the contractor and assisting with technical problems as much as possible. The research team also had two members serve as representatives to the other groups; one administrator serving as the management conduit between the groups and the other taking the primary technical interface role with the platform and the contractor. Changemaker not only provided programming and training to drive participation to the site, but they also curated content on the site, and were the front line administrators that found problems with the platform and passed the information on so it could be resolved. Every administrative group expressed appreciation for the lack of artifice or manipulation from anyone in the collaboration. Open, frank conversations and problem solving were identified as key assets for making the collaboration work. There was also a sense of solidarity that developed over time among the members of the collaboration was the novel and experimental nature of 10,000 Solutions:

> I think one of the things that you brought that was most helpful that I didn't understand initially was a real understanding of what an experiment 10,000 Solutions was. I think the whole time we were part of an experiment, and for a really long time we didn't realize we were part of an experiment. As researchers, giving that feedback. I remember there being a point in time when you did some early interview and interactions with the students and I think just being interviewed in that way lit off a flash bulb for them--"Oh my god. We are. We are part of an experiment. This is experimental! I thought this was just like another program we were delivering". I mean, every part of the program is experimental.

One of the key success metrics mentioned between the three groups was the relationship established through the experience of managing 10,000 Solutions. While part of the

relationship was established due to the shared accountability and common fate for each collaborative group, the interview responses indicate that the genuine effort put in by each group and an understanding of the difficulties of managing a novel project like 10,000 Solutions were what mattered most. None of the groups felt alone, and they felt they could rely on their partners to do their very best.

Second, while the partners valued the 10,000 Solutions collaboration, they also knew it was not a perfect process, and there were issues limiting effective management. In some ways administrator responses are captured on this dimension by the following quote:

> I don't know that we ever really hit the complete sweet spot with this team idea. I think our intentions were all really good, but we kind of came across what's really difficult about teams, which is, we all have different incentives and approaches. I think we were trying to walk the walk, in terms of how to be collaborative. But sometimes that was really tough. But I mean, not shocking that it was tough.

While more aligned than I had anticipated prior to this research, the collaborative partners did not have perfectly aligned goals, objectives, and approaches regarding the platform. In some ways the awareness that there wasn't perfect alignment was important as all members of the collaboration knew it was important to discuss an individual group's goals and understand the goals of their partner groups. Financial and staffing resource constraints have been discussed throughout this chapter. None of the groups were prepared for just how resource intensive a platform like 10,000 Solutions truly was in terms of design costs and maintenance. Still, there were instances of resource sharing and contributing funds toward the redesign costs.

The round table structure of the collaboration meant there was no ultimate leader. While this was appreciated, it also had its associated challenges:

> There was a shared hope that the platform would be healthy, but there was not sort of a clear organizational chart between the three different groups. And so there was at times, much confusion of who was responsible for what aspect, and who was accountable for different elements of the participation. In general, there was responsiveness, there was sort of positive attitudes toward each other, but there wasn't the sort of activities and events that were necessary to make sure that everyone was on the same page.

A related issue of having three departments collaborating on one project was that the departments are in different locations. While meetings helped keep everyone up to date, the physical separation and work obligations meant there were projects and work being done independently of each other. Working in closer proximity was a desire of many of the respondents.

Third, the external contractor was a source of strain on the collaboration. The external contractor had experience working with the university on other web design projects. Those past experiences shaped what the contractor thought would be sufficient with the design of 10,000 Solutions. The gap of understanding was how different 10,000 Solutions was from anything else designed at Arizona State University or in the library of the contractor's projects. The contractor never spoke to the substantive objectives of the platform during the interview, and did not seem aware of the functionality problems that were plaguing the internal administrators. Both the research team and Changemaker team spent substantial amounts of time and effort to combat the tidal wave of spam with little

support from the contractor to weed out the spam or improve protections to prevent spam. The contractor spoke about how they allow for some discussion of what can be considered in scope for a project and what is out of scope of their contract, a good practice that allows some discussion to take place. However, the contractor viewed back end functionality as out of scope at first, not understanding that that was a fundamental aspect of the redesign.

Organizational Learning

Concept. Several insights on organizational learning articulated by administrators were at the programmatic level. First, ideation, while a great first step, is not enough to create a culture of continuous interaction. Administrators learned that there is a lot of responsibility for thinking about participation as the beginning of a relationship or practice. Having some ability for participatory decision making is an important component of a successful open innovation effort:

> I really feel like the biggest learning for me out of all of this is to really listen for where there is interest, and keep it as big as you can, "We are about cultivating a culture of innovation and problem solving, what do you think we should do to make that happen?" Then really listen to their genius in that. There is a delicate balance. That's the biggest thing, still providing the big parameter but giving more freedom to create what programming looks like inside that parameter.

Administrators need to think about the next steps for interaction, such as connecting ideas to the organizational administrators who can help with idea refinement or application. Multiple approaches need to be made to capture the larger population of the university, not just the crowd of self-selected participants. Finally, administrators need to push themselves to better understand what their programming is doing within the organization

> It wasn't until later that we started realizing about certain programs and started to ask ourselves with our students questions that I think can only come with maturity. "HOW does our programming promote a culture of service? HOW does our programming create a culture of innovation? HOW does our department challenge create a culture of entrepreneurship?"

At the organization level, the insights were very positive when it came to organizational learning. Administrators were at times surprised at how much they were able to accomplish in a relatively short time span:

> As an institution we are capable of more than we think we are. We are able to move quickly. We are able to be nimble. We are a role model. We have a responsibility to share what we learn with other institutions to inform what they are doing.

New structures are being created within some departments within the university to handle the extra complexity that working with innovation projects require. There needs to be personal accountability for every administrator on a project to ensure the work moves forward. Failure is not a scary concept, but something that administrators understand can happen without catastrophe. There are new insights on metrics for leadership, particularly regarding collaborations:

> Yes, that was my point about working horizontally. Everybody can work vertically. The easiest part of leadership is directing effort down the organization. The, the real burden of leadership is demonstrating leadership across the institution, where formal authority is not yours. It is an important part of innovation.

The last insight at an organizational level is to get a better understanding of where pushback or resistance to change comes from:

> Resistance is interesting, it is usually a derivative of fear and protection. Neither of those things were activated in this case. I worked really hard to try to make sure that things like this don't get to the point where they activate fear, and thus resistance. Other things we've done have activated those feelings and those thoughts, but not this one. So, back to the core question: 1) Do it in ways in which they are not threatening to the organization, 2) Do it in a way where there's no resource issues that become part of a negative thought pattern about these kinds of initiatives, and 3) Do it in a way where it's not a big deal. It's a deal, but not a BIG deal.

Administrators included in this research understand their role in creating change in the university. The task of making Arizona State University more innovative and open is an enormous operational and cultural change. Successful evolution of organizational practice requires genuine listening, understanding and empathy for administrators that are struggling with new expectations given to them, and provide many opportunities for practice. The only way to make this innovation change permanent at the university is to increase experience and remove fear so use of innovative projects and collaborations truly become a normal way of operation.

Alignment. The prediction that administrators, particularly the intermediaries, would have a lot of detailed organizational learning resulting from the experience of managing 10,000 Solutions, was supported. The prediction about fatigue was also supported. Respondents mentioned the lack of organized reflection on the entire process or their role in it, more that the platform crashed and everyone moved on to other projects. Each group had unique lessons based on their role in the collaboration. Leadership administrators had insights on how to provide staff resources once a project has been spun out of their office to

assist with transitions. The intermediary managers had insights about moving a project forward within their own teams, particularly in regards to giving staff administrators more efficacy to make functional and substantive changes to the program they were tasked with maintaining. The research team found that members of their team had to be personally accountable for accomplishing a research objective. In the first iteration there were only a few of the members to took a fully active role in executing research; in the second iteration the team had new members with more commitment to executing their research objectives. The Changemaker team learned how to design programming that focuses on the root challenges of social entrepreneurship and change making. They were able to take some of the 10,000 Solutions objectives and recreate them in a physical ideation event called Solutions Summit. They also understood that if you are asking students to serve as administrators and champions for a project, they need to have more control on what that project is doing, especially if the project is a larger collaboration like 10,000 Solutions. The intermediary staff strongly agreed that they learned that managing an effort like 10,000 Solutions is much harder and much more complex than they had imagined. To create a project of value there must be balance; balance between the online and the offline, and balance between pushing people to ideate more often and to ideate more thoughtfully. The external contractors learned that working on some projects forces them to almost work backwards. Most often, university designers give exacting guidelines on everything, so the evolving and flexible nature of 10,000 Solutions provided some new challenges for their team.

Some respondents noted that they did not feel their group would be best for being involved in platform design again, though they would be interested in collaborating on a

hybrid platform effort if they could focus on their departmental strengths. At the same time, there was agreement that the management of 10,000 Solutions was instrumental on advancing their substantive work on innovation, community engagement, and entrepreneurship:

> Partially, 10,000 Solutions kept our focus on ideation and innovation problem solving as a value. It started there. I guess it could have evolved differently, but I think that experience not only helped us get to where we are now with that ideation work, but it also influenced some of the other ways we evolved as a team.

Finally, a consensus insight was that 10,000 Solutions was an articulation of a larger effort within Arizona State University. They appreciated the organizational support for experimental projects that drive towards a culture of innovation and social entrepreneurship.

Discussion

Creating a cultural and operational change to an organization is an immense undertaking. Saying that culture and teamwork matters is not a generic statement. Administrators at Arizona State University are undergoing an enormous learning curve for creating open innovation programming and making the university use open innovation as a regular way of conducting business. An easy example is that working within departmental silos is no longer the preferred way to conduct work or achieve organizational goals at Arizona State University. Working across silos is a skill that not many administrators are trained to do, and requires practice and expertise to do well. Open innovation requires the mastery of three areas: understanding of functional and substantive contributions of technology, programmatic goals, and the interests and skill sets of potential participants. Without all three areas, it will be very difficult to be successful at open innovation. The

practice of innovation, ideation, and participation is a skill that both administrators and participants have to learn. To that end, administrators found that creating more avenues for co-creation with partners and student participants was important for creating buy in, and ultimately successful programming. In bottom up participation, there must be balance between participant efficacy and voice, but also enough guidance and structure to make efforts effective. In regards to alignment; the analysis demonstrated that perceived misalignment was higher than actual misalignment between collaborative groups, which was counter to the alignment predictions. Still, that perception of misalignment impacts the work of a collaborative team. The final point comes about the discussion of the external contractor for 10,000 Solutions. The big problem with KWALL was only in part that they were external to the university. The operational flow was a hindrance for effective management of the platform. However, the bigger problem was the extreme misalignment with the university administrators. There was no indication that they understood what 10,000 Solutions was trying to accomplish and had no idea how poorly they were executing the design of the platform. This speaks again to the need for the mastery of technological, programmatic, participatory skill sets, and consistent prioritization for all administrators working on an open innovation project. If there are differences in the skills sets or priorities of the different administrative groups, the project will not receive the support it needs to be successful.

Analysis of Innovation Culture Responses

Double Loop Learning

Concept. The proposition for the double loop learning concept was that the majority of respondents would see their work as contributing to the existing schema of the

New American University rather than the other rather than changing the schema. With three exceptions, this was true. Every respondent referenced the mission of the New American University almost verbatim. The respondents who thought their work did change the schema of the university were in leadership roles with a specialization for bringing in change. It was clear that the university narrative is set, and the work of administrators are working to realize that narrative objective. I will include the one outlier who responded with a strong affirmative:

> Absolutely. When I took this position one of the things I was told was that my job was to be incredibly disruptive and not get caught. It was said in jest, but there's a little bit of truth to that. Part of the job of being a driver of innovation is to challenge assumptions, to challenge, old ideas, bring new ones, and to make people and organizations uncomfortable. That (intentional disruption) is something that is a value and has been successful in generating change and innovation.

It is not a problem that administrators did not feel their work was supporting the schema of the university rather than changing it. Double loop learning is less common in an organizational setting than single loop learning. Furthermore, seeking to realize the practice of the new organizational schema, The New American University, is a substantial operational and cultural challenge. The expertise being gained by administrators in this effort is valuable on its own.

Alignment. The prediction for double loop learning was that administrators will identify their work as resulting from but not causing double loop learning within their organization. This prediction was confirmed from administrator responses. Intermediary managers felt that 10,000 Solutions caused double loop learning within their own

departments, particularly in regards to what goals should be prioritized and how those goals are realized through programming and online tools. However, the dominant theme from respondents was that 10,000 Solutions did not cause double loop learning within the university itself.

Organizational, Political, and Bureaucratic Factors

Concept. Organizational, political, and bureaucratic factors had findings that were consistent with many responses discussed above. As predicted, the ASU environment had an enormous influence on their work. Every single respondent referenced the New American University as not only a mission statement, but a way of work, collaboration, and evaluation. The attention and presence of leadership was appreciated by interview respondents, particularly that of President Crow. Challenges that were noted include difficulty navigating a university of the size of Arizona State University, and managing programs for that entire population. Over half the respondents mentioned the reality and sometimes challenge of running lean with program management. There are also challenges with projects getting a relatively short time window of intense attention. There was one instance reported of an administrator attacking a program for petty political reasons, but that instance was both rare and unsuccessful. Concerning external interactions, administrators noted that they examine peer groups who are also at the cutting edge of their respective fields of innovation. Utilizing long and short term partnerships were a regular practice of administrators in the organization. In short, administrators at Arizona State University are making the transition to open innovation practices, and appreciate their contribution to making open innovation an organizational reality.

Alignment. The prediction that responses about organizational, political, and bureaucratic factors would center around the institutional culture of Arizona State University, and the realization of the New American University design objectives. This was confirmed, for both good and ill. The administrative leadership understood that to create organizational change there must be disruptions to the normal way of running the organization. Projects like 10,000 Solutions, not just its existence for students but the task of designing and managing for administrators, disrupts normal ways of doing things. The leadership respondents spoke about how learning to manage choices and tradeoffs is an essential component of the university culture. The intermediary respondents agreed that the culture of the university has highly influential and supportive of the idea of 10,000 Solutions. Where they gave pushback was that a project like 10,000 Solutions was not the same as other innovation projects and could not survive without more extensive investment, "You can't boot strap a project like 10k. I think there was an expectation that we could boot strap it, and I think there is an institutional culture of bootstrapping that didn't serve us well." Intermediaries spoke to that there was a choice of the university to really commit to this idea of a bottom up many-to-many hybrid platform and provide resources to continue pushing its evolution, or let this particular experiment end. In the case of 10,000 Solutions it ended. The research team had to serve as a protector role for the platform at one point in its lifespan:

> We did have a couple people that we had difficulties with, that did not necessarily see the value of 10,000 Solutions. At different times they threatened to even shut down the research, or shut down the platform because they didn't think it was sort of the best investment of time or energy, or the best way that you could have a specific

project. It's unclear what their motivations were for you know, threatening to shut down 10,000 Solutions, or if they even had the ability to do so, but it wasn't broadly seen as a universal success, it was seen again, as a part of the ecosystem within ASU.

There is no indication that this threat to the platform came from the administrative leadership in this study; they were very supportive of the work being done on 10,000 Solutions, and appreciated how it got students engaged in ideation and social entrepreneurship.

External influences for administrators of all groups were the few other organizations practicing innovative ideation and entrepreneurship around the country. These served as peer counterparts to 10,000 Solutions. There were also external partners that agreed to host a short-term challenge of the month to generate participation about an issue within their purview. These external contacts were discussed as additive and helpful for being part of a community of ideation and social entrepreneurship.

Transformative Learning

Concept. The proposition in regards to transformative learning predicted that responses would be about complexity. The responses instead were almost purely focused on creating an authentic New American University. Administrators were again consistent in their assessment that they are all in the midst of a process of learning. There was a positive response about complexity that was also echoed in all respondents, that being that management of innovation efforts are significantly more complex than initially anticipated and take a unique mindset. In particular, successful teams have a different appearance than administrators may have originally conceived:

> The strength of your own team is not as important as buy in across the institution. Having a rock star team of the greatest ten people in entrepreneurship and innovation ever would not help advance an institution or a culture for students or faculty or staff as much as having mediocre people but a climate and ecosystem where everyone knows it's a shared value.

Administrators appreciated the role of intermediary departments that are tasked with creating innovation environments and opportunities. Administrators in the university are indicating better understanding of what it takes to effectively interact with participants, using techniques like the "yes, and" approach and that of the humble modeler where projects are built with participants not just for participants. Respondents noted a better understanding of how to be strategic with any future efforts, particularly those using technology as a medium. Administrators are not unaware of the challenges of an innovation mindset, "A culture of innovation is a double-edged sword, as it continually demands newness as a measure of success. This can come at the expense of focus on the present." The final insight about transformative learning is almost the "know thyself" mantra. Administrators emphasize that the way to keep organizational cohesion through the tumult is to know the people, know the programs, and know the mission to the core. For Arizona State University, change is becoming part of that identity core:

> I think keeping in place all the ideas you just mentioned, which are bottom-up, iterative, non-linear innovation practices allow them to occur, to facilitate their occurrence. Accept the defeats and move on. Find ways where you can stimulate many things rather than a few things, with the assumption that 70% of them might have a chance at success, and of those, half might be very successful. The others

> might be marginally successful. You do all of that in what I call an evolutionary model, where you're thinking about adaptation of organizational routines as the way to drive organizational change. You're trying to change how you do this, or how you do that, and from this or that you are getting differentiated outcomes, differentiated ways of the organization adapting to externalities or changing internalities. In terms of recommendations, it's just got to be an organic process. It's got to be anything other than something related to the regular organization. It's got to be anything other than something linked to the way that organizations regularly operate. So, organic, fluid, interactive, adaptive, non-linear, bottom-up, all those things.

In sum, administrators need to know their organization well, and in the case of Arizona State University that means understanding and embracing complexity and change. Part of this understanding comes from reflection on work being done. Half of the respondents specifically stated they appreciated the opportunity to reflect on their work and the projects they managed. The inclusion of strategic reflection on a more regular basis would be beneficial. This does not have to require extensive paper work, just purposeful pauses for reflection and feedback.

Alignment. Arizona State University is in a state of constant experimentation in its push to become the New American University in practice. The insights on transformative learning from administrators were at a higher level rather than an operational level, with questions like, "We are becoming students of creativity, and I think this is out of innovation push. How do you create creativity?" Administrative managers emphasized the need for challenging themselves to use the "yes, and" approach to new ideas, where the default response to experimenting with innovative programming is a default rather than the rare

exception. This change in mindset combats the idea that a university cannot design experimental programming like 10,000 Solutions. The leadership staff noted that they think there is still interest in the university for participatory platforms like 10,000 Solutions. In that case there is a great deal more experience about the management of a platform like this, which could contribute to future successes down the road. One example of continued work in open innovation is the creation of the Innovation Challenge, a university wide event that took many of the goals from 10,000 Solutions along with the new insights on program design that came from administrator's experience of managing platforms to keep the practice of innovative ideation going at Arizona State University. The leadership staff also used a current and future objective of the university to create authentic engagement. This was echoed by the intermediary staff, who urged that genuine collaborations and co-creation of projects will be an increasingly important skill to master. They also push for moving engagement activities beyond participation for its own sake, and towards genuine efforts to solve problems. A project desired by intermediaries would be the creation of an entrepreneurship component of Arizona State University student profiles. They want innovation and entrepreneurship to be as important a component of learning as coursework. The student intermediaries at Changemaker developed a pilot version of what this platform could look like and how it could be integrated into the primary student platform MyASU. The final insight came from an intermediary manager about the role of Changemaker in particular. Intermediaries like Changemaker, who specialize in engagement and social entrepreneurship, and have demonstrated a reputation for taking on large, complex, and unique tasks like the co-management of 10,000 Solutions. The argument was that to succeed at innovation groups like Changemaker need to be seen as leaders within the university and

given the resources to execute the tasks they have opted into, and the tasks they are asked to take on.

Discussion

In this case study of Arizona State University, the cultural expectations of the New American University are accepted by administrators, and the process of articulating those cultural expectations through university programming are well underway. There is not a feeling of complete achievement, where administrators feel that the new way of operating is standard procedure. Instead, there is more a sense that the university as a whole is a place of experimentation, where challenge, inspiration, and discomfort are to be expected.

Administrators at Arizona State University were highly aware of the role of 10,000 Solutions in the larger mission to master innovation practices that make the New American University a reality rather than an aspirational statement. There was agreement that this culture has strengths and drawbacks for participatory platforms; on one hand, there would not have been a 10,000 Solutions initiative without the support and investment of the university. On the other hand, platforms like 10,000 Solutions are more resource intensive than other innovation programs at the university and require additional support if they are to be successful in the long term.

Conclusion

The objective at the outset of this chapter was to examine what Arizona State University administrators learned about design values, teamwork, and organizational culture through the management of their open innovation project or program. Condensing down to the bare essentials, I can demonstrate that the task of effective open innovation adoption is a challenge of culture change within an organization. Participants and administrators are

tasked to do activities they have never done before, faster than ever before, and learning how to operate in an interactive system where there is an understanding that not all projects will take flight. Regarding interactions with other partners, staff, or participants, genuine efforts are important. Even with that welcome attitude, efforts will not necessarily be successful without a vision, an understanding of what you are asking participants to do, functionality of the effort, and the ability and resources to make changes. An understanding of the organization itself helps guide individual projects forward, ensuring that open and collaborative efforts are being made to change the university experience for every person associated with Arizona State University, from the first day freshman to the university president. The biggest contribution from this research is the practice of three hybridity arrangements: unintentional, segmented, and fluid hybridity. Understanding differences in hybridity use can be added to knowledge about participatory programming, like the International Association for Public Participation's spectrum of participation. The use of hybridity can be neither a simple add on, nor understood at a superficial level by administrators, but deeply understood for its unique contributions to any effort for engaging the public. This is an extension of the evolving design of participatory platforms. In addition, the detailed understanding of open innovation intermediaries illustrate the structural changes and administrator responsibilities that need to be present to change the practice and culture of an organization.

Chapter 3 - Demographic Survey of Student Open Innovation Programming

Overview

The previous dissertation chapter examined the experiences of administrators who manage open innovation programming within Arizona State University. The administrator perspective is valuable for capturing information about the learning curve and broadening the potential metrics for evaluation of open innovation efforts. While the study of administrators is an interesting perspective, it is not the only way to examine the case of open innovation implementation at Arizona State University. The use of different methods is better suited for different research questions that apply to this case study. The objective of this chapter is the examination of student participation in open innovation programming. As discussed in Chapter One, Arizona State University has a large population spread over four campuses in the metropolitan Phoenix region. The university also has an organizational goal of having the population of the university mirror the population of the state of Arizona. A demographic assessment of student participation can indicate which students are being exposed to open innovation programming, and indicate where changes can be made in future efforts.

The overall research question for this chapter is: what are the demographic characteristics of participants in Changemaker Central and the Office of Entrepreneurship and Innovation programming, and does participation have an impact on educational outcomes? This chapter is organized as follows. First, three research questions are posed that address different components of the overall research question of the chapter. Each research question has a contextual grounding and a hypothesis. Second, a discussion of student demographic data and Changemaker Central and the Office of Entrepreneurship and

Innovation program data is presented. Third, the results of each research question are presented. The chapter concludes with a discussion of findings, and contributions of this analysis to future research.

Context, Research Questions, and Hypotheses

Organizational Goal of Student Innovators

Context. A primary goal of Arizona State University is to be inclusive in its acceptance of students, which is a different approach to student enrollment than most universities who prioritize exclusivity (M. M. Crow & Dabars, 2015). A component of inclusivity for the university is striving to achieve a student population that is representative of the state of Arizona (M. Crow, 2016a). An additional component of the university objectives is to create students that are master learners, and it is argued that participation in open innovation programming is one way to train Arizona State University to become a master learner (M. Crow, 2016b). Therefore, it is of interest to see if the programming of Changemaker Central and the Office of University Initiatives is reaching the full breadth of the large and diverse student population of the university. Without comprehensive coverage, some students may not be exposed to programming that the university feels is contributing to an overall culture of innovation.

Research question. How does the demographic profile of student participants in Changemaker Central and Office of Entrepreneurship and Innovation programming compare to the demographic profile of the entire student population of Arizona State University?

Hypothesis. It was anticipated that the demographics of student participants in Changemaker Central and Office of Entrepreneurship and Innovation programming will

resemble the demographic profile of the general Arizona State University student population.

Positive Relationship Repeat Participation and Academic Outcomes

Context. There is an established agreement that measures of academic success like grade point average are indicative of performance of meeting class expectations more than what a student has learned in the class itself (Astin, 1977). Arizona State University is making the claim that the change in its organizational structure and focus on solving real world problems provides students with the skills needed to succeed both academically and in pursuit of improving the world (M. Crow, 2016a, 2016a; Faller, 2016). Inherent in that argument is that the more a student participates in innovation oriented learning, the more competent they will be (M. Crow, 2016b). This is consistent with research on self regulated learning in higher education: self regulated learners proactively seek out information, work with others, and overcome obstacles (Zimmerman, 1990). In the case of Arizona State University, most open innovation programming is voluntary. Therefore, students who participate more in open innovation programming have stronger self regulated learner skills that can improve their performance in classes. For the purposes of this study, a question can be posed about whether repeated participation in open innovation programming has any impact on measures of academic achievement.

Research question. Are there significant differences of student characteristics between one time participants and repeat participants in Changemaker Central and Office of Entrepreneurship and Innovation programming?

Hypothesis. It was anticipated that repeat participants will have higher educational outcomes than one time participants, particularly in terms of retention, grade point average, and graduation.

Differences of Student Participation in Program and Activity Formats

Context. It has been established that there is a large, diverse population of students at Arizona State University. This means that one size fits all programming will not be uniformly attractive to all students. It is argued that the use of affinity spaces can be a powerful tool for the formation of shared identity among students and improvement of their ability to achieve a goal or complete a task (Gee & Hayes, 2012). Students who participate in a higher education community, such as honors colleges, academic programs, student government, or athletics not only have better academic skills, but also connections to peers, support for university goals, and investment in university outcomes (Astin, 1984). It has been found that perceived student proficiency is a useful evaluation measure for learning in higher education institutions (Cassidy & Eachus, 2000). Crow (2016b) stresses the importance of innovative programming in many different substantive areas of the university. To understand if open innovation programming is effective in reaching the student population, it is helpful to look at participation trends by the programs and activity formats offered through Changemaker Central and Office of Entrepreneurship and Innovation programming.

Research question. Do participant characteristics vary across different program and activity formats provided by Changemaker Central and Office of University Initiative programming?

Hypothesis. 1) It was anticipated that different student groups will be interested in different program and activity formats. 2) It was not anticipated that different program and activity formats have differences on academic outcomes.

Student Demographic Data

Understanding the participants engaging in open innovation programming can provide insights into the spread of student engagement across this large and diverse university. There are three sources of data on Arizona State University students included in this analysis. The first source of student data includes students that participated in open innovation programming hosted by Changemaker Central and/or the Office of Entrepreneurship and Innovation. Both departments provided participant data for a number of their programs, which are specifically identified in the next section. The College of Liberal Arts and Sciences Office of Student and Academic Affairs pulled individual level demographic variables using the list of participant data compiled from Changemaker Central and the Office Entrepreneurship and Innovation. All identifying information for student participants was removed by the CLAS Office of Student and Academic Affairs, so that this information for a student participant was not included in the final participation dataset. The student level variables included gender, race/ethnicity, graduation status, and academic status at the semester/year of participation, such as semester GPA, Pell eligibility, residency, major, financial aid offered, and full or part time status. A variable about retention is included in this dataset. Retention is operationalized in this dataset as enrollment status in the semester following the semester of participation. For example, if a student participated in a program in the Fall 2013 semester, they are classified as retained if they were enrolled at the end of Spring 2014. This differs slightly from how Arizona State University operationalizes

retention, which only examines the enrollment of students after completing their first year. This means that all comparisons of student retention in this study come with a caveat that it is not possible to make a perfect comparison to the definition used by Arizona State University.

There were no data collected about students who did not participate. Information is available about enrolled student demographics at Arizona State University, and this is used to make comparisons of participating students and the general student population. These general student data come from Fall 2014, which is the most recent information available. Also included are the Arizona State University Quick Facts, (2015), which can be found in Appendix C. Additional data include Arizona State University enrollment trends by college and department (Arizona State University, 2014a). There are 351 unique majors at the university. In this analysis, majors were organized into six college cluster groups, included in Table Six. These are presented in Table 3.1. For general student enrollment, only college cluster groups A, D, and F are included, as they directly matched the colleges included in student participant data. General participation rates for groups B, C, and E were excluded as there were missing colleges that were formed after Fall 2014.

Table 3.1: College Cluster Groupings

College Cluster	Colleges Included
Group A	Letters & Sciences, Liberal Arts & Sciences, Law, Journalism
Group B	Nursing & Health Innovation, Nutrition & Health Promotion, Health Solutions
Group C	University College, Graduate College, New College, Provost
Group D	Public Programs, Public Service & Community Solutions, Business
Group E	Technology & Innovation, Engineering
Group F	Design & the Arts, Sustainability, Teachers College

Program Data

Both Changemaker Central and the Office of Entrepreneurship and Innovation have a vested interest in creating meaningful open innovation programming that is used by students and increases the skill sets that are highlighted in the design objectives of Arizona State University. Both departments volunteered their program and participant data for this study in the interest of learning more about the breadth, depth, and diversity of student participation in open innovation efforts.

Programs included in this dataset range from 2011-2015[1], and program level variables included are the semester-year of the program, the format of the program, and the activity facilitated in the program. The program format types included in the dataset are a class, event, camp, challenge, and platform. The activity types included in this dataset are ideate, inform, attend, and advance. Below are the specific programs included in this analysis:

Entrepreneurship and Innovation Programming

- Launch Day Classes - Taking place on Launch Day at Arizona State University, the Office of Entrepreneurship and Innovation gives ten minute classroom presentations that highlight the resources available for entrepreneurship and innovation efforts and shares a call to action with the students. These presentations are held for classes on all four campuses. This data are from Spring 2015.
- Launch Day 1:1- A component of Launch Day is the provision of one on one mentoring for students interested in entrepreneurship. These mentoring conversations were primarily about hearing more specifics on entrepreneurship and innovation efforts. This data are from Spring 2015.

[1] Programs were available to students on all four campuses of Arizona State University.

- Open Pitch- Another component of Launch Day programming, Open Pitch is a competition where students present a two minute pitch to community judges to receive funding for their idea. There was not a restriction on the minimum development of an idea, so students participated based on their level of commitment to the idea. These data are from Spring 2015.
- Startup Spring Break - This program is a five day boot camp where students work on advancing an entrepreneurial idea or project. Entrepreneurship and Innovation staff provide mentoring, curriculum. and workshops for participants.
- Edson Student Accelerator - The Edson Student Accelerator is a group of more than ninety individuals engaged in accelerating their entrepreneurship ventures. Support is provided to these participants by the Edson Student Entrepreneur Initiative. The ventures can have external participants, though there must be at least one key founder whom is directly affiliated with Arizona State University.

Shared Programming

- Startup Summit - Startup Summit is a joint collaboration of The Office of Entrepreneurship and Innovation and Changemaker Central. The event is a one-day conference that provides workshop sessions and mentoring opportunities that connect students with information and resources for innovation. Data in this analysis are from 2015.
- Innovation Challenge - The innovation challenge is a joint collaboration of the Office of Entrepreneurship and Innovation and Changemaker Central. It is a series of competitions that push students to develop entrepreneurial skills and have impact

on real world problems. Data in this analysis are for the 2012-2013 and 2013-2014 iterations.

Changemaker Central Programming

- 10,000 Solutions - a hybrid participatory platform where participants can share ideas, host or participate in challenge, or host or participate in an action. Data from this analysis are from 2011-2014.
- Woodside Community Action Grant - The Woodside Community Action Grant is a seed funding competition for student service projects. Woodside data used in this analysis are from 2014-2015
- Clinton Global Initiative University Clinton Global Initiative University data used in this analysis are from 2014.
- Changemaker Challenge - Formerly the Innovation Challenge, the Changemaker Challenge is challenge where students can develop a project, prototype, venture, or community partnership. Changemaker Challenge data used in this analysis are from 2014-2015

Ideation was a dominant activity in both Changemaker Central and Entrepreneurship and Innovation programming. The majority of programming included in this dataset had a finite time period for participation, such as a one-time experience like the Clinton Global Initiatives University, events or competitions that occur annually. The exception is 10,000 Solutions. A participatory hybrid platform, 10,000 Solutions was designed for continuous participation. Though events were conducted for 10,000 Solutions, the primary function of the platform was to support continuous participation. Therefore an additional 10,000

Solutions program variable is the number of participation instances. Table 3.2 presents a summary of programs in this dataset.

Table 3.2: Summary of Programming[2]

Title	Hosting Group	Term(s)	Format	Activity
Launch Day Classes	Entrepreneurship & Innovation	Spring 2015	class	attend
Launch Day 1:1	Entrepreneurship & Innovation	Spring 2015	event	inform
Open Pitch	Entrepreneurship & Innovation	Spring 2015	challenge	ideate
Startup Summit	Entrepreneurship & Innovation	Spring 2015	event	ideate
Startup Spring Break	Entrepreneurship & Innovation	Spring 2015	camp	inform
Edson Student Entrepreneurship Initiative	Entrepreneurship & Innovation	Spring 2015	event	advance
Innovation Challenge	Entrepreneurship & Innovation and Changemaker	Spring 2013, 2014	challenge	ideate
10,000 Solutions	Changemaker	2011- 2014	platform	ideate
Woodside Community Action Grant	Changemaker	Spring 2015	challenge	ideate
Clinton Global Initiative University	Changemaker	Fall 2014	event	ideate
Changemaker Challenge	Changemaker	Spring 2015	challenge	ideate

Results

Student Demographics: Participants and overall ASU population

In total, 7,125 students comprise the participant sample, meaning that students participated in one or more of the open innovation programs (Table 3.3). In general, demographics of participation in these programs and activities closely resemble those of the total population of enrollment at Arizona State University (Arizona State University Office

[2] For Changemaker programming, the term is associated with the terminal event of the program. For instance, the Changemaker Challenge ran from fall 2014 to spring 2015, with the terminal event taking place in spring 2015.

of Institutional Analysis, 2015). Data from the Quick Facts report are included in the ASU % column for comparative purposes. Hispanic and White student percentages are 20.2% and 55.4% in the ASU demographic report, and are 19.8% and 51.5%, respectively, in this sample. That the demographics in the student participant sample resemble the overall ASU demographic profile indicates that open innovation programming has appropriate breadth throughout the university. Of the sample, 95.2% are undergraduate students and 4.8% are graduate students. This is somewhat similar to the 81.0% and 19.0%, respectively, of the ASU student population, though there are more undergraduate student participants in the sample. Resident students account for 65.2% of the participation in these programs and activities, compared to the 34.8% of non-resident students: student residents at the university are 60.0% and 40.0% are non-residents. The majority of students tend to have GPAs in the higher range of possible values. The college cluster groups that participated most frequently include Group D- Public Programs, Public Service & Community Solutions, Business (28.6%), Group E- Technology & Innovation, Engineering (23.9%), and Group A- Letters & Sciences, Liberal Arts & Sciences, Law, Journalism (22.9%). There are ten percent more students participating in the Group D sample cluster than in the Group D university population. There is an observed retention rate, of 91.8% which is 7.2% higher than ASU's freshman retention rate.

Table 3.3: Overall Sample Population and ASU Student Population

Variable	Spl* %	ASU %	Variable	Spl* %	ASU %	Variable	Spl* %	ASU %
Pell Eligible	36.0%	---	**Undergrad**	95.2%	81.0%	**GPA < 1**	2.6%	---
Financial Aid Offered	89.1%	---	**Graduate**	4.8%	19%	**GPA 1 - 1.5**	1.7%	---
Resident	65.2%	60.0%	**Full-Time**	94.0%	82.0%	**GPA 1.5 - 2**	3.8%	---
Non-Resident	34.8%	40.0%	**Part-Time**	6.0%	18.0%	**GPA 2 - 2.5**	9.1%	---
Caucasian	51.5%	55.4%	**Online**	0.3%	---	**GPA 2.5 - 3**	16.8 %	---
Hispanic	19.8%	20.2%	**Group A**	22.9%	27.4%	**GPA 3 - 3.5**	27.6 %	---
African American	4.8%	5.0%	**Group B**	12.2%	**---**	**GPA 3.5 - 4**	26.3 %	---
Asian	7.0%	5.8%	**Group C**	7.7%	**---**	**GPA >= 4**	12.1 %	---
Other	17.0%	13.6%	**Group D**	28.6%	18.0%			
Male	55.8%	50.8%	**Group E**	23.9%	---			
Female	44.2%	49.2%	**Group F**	4.7%	10.5%			
Graduated	32.2%	49.0%						
Retained	91.8%	84.0%						

*Total sample population = 7,125; Total ASU population = 83,310. Null or missing values filtered for each cell

These results of this assessment are encouraging in that the characteristics of students participating in Changemaker Central and Entrepreneurship and Innovation programming are relatively similar to that of the demographic profile of the university.

Comparison of One Time Participants and Repeat Participants

The second analysis on student participation is an examination of differences between students who only participated once compared with participants who participated in multiple programs. The factor of one-time participation or repeat participation was first isolated, and difference of proportion tests were conducted to identify significant differences in key variables. Results show that students who participated in more than one program had a significantly higher grade point average, 3.30, than students that only participated once, 3.11 ($p < 0.01$). This confirms the hypothesis that there is a relationship between repeat student participates in open innovation programming and student success in university studies, though the direction of causality cannot be determined with this analysis. Another educational attainment variable that supports the hypothesis was graduation. Repeat participants graduated at a higher rate than one time participants (40.2% and 31.7% respectively). There is no significant difference in retention rate through the next semester of their studies between one time participants and those that participate more than once.

In addition to the academic achievement variables, there were some statistically significant differences in student characteristics. Repeat participants were more likely to be Pell eligible students than one time participants, 43.5% and 35.5% respectively ($p < 0.01$). Repeat participants were also more likely to be offered financial aid than students that participated only one time, 93.1% and 88.8% respectively ($p < 0.01$). Of note, repeat participants tended to be significantly more male, 63.4% ($p < 0.01$) and graduate students, 10.0% ($p < 0.01$), than female, 36.6% ($p < 0.01$), or undergraduate students, 90% versus 95.5% one-time participants ($p < 0.01$). There was no significant difference in resident vs.

non-resident participation, or between White, Hispanic, Asian, or African-American students.

Table 3.4: Difference of Proportions / Means Tests for One Time vs Repeat Participation

Variable	One Time (n=6674)	Repeater (n=451)	Test Statistic	*p*-Value
Pell Eligible	35.5%	43.5%	10.6	<0.01*
Financial Aid	88.8%	93.1%	7.32	<0.01*
Resident	65.1%	67.0%	0.555	0.46
Caucasian	51.8%	47.0%	3.62	0.06
Hispanic	19.6%	23.1%	2.97	0.08
African American	4.8%	4.9%	<0.01	1.0
Asian	7.0%	7.1%	<0.01	0.984
Male	55.3%	63.4%	11.1	<0.01*
Female	44.7%	36.6%	11.1	<0.01*
Graduated	31.7%	40.2%	14.2	<0.01*
Retained	91.7%	92.7%	0.378	0.54
Undergraduate	95.5%	90.0%	27.1	<0.01*
Graduate	4.5%	10.0%	27.1	<0.01*
Group A	23.4% (n = 1,562)	16.0% (n = 72)	12.8	<0.01*
Group B	12.4% (n = 828)	9.1% (n = 41)	4	0.045*
Group D	29.2% (n = 1,949)	19.5% (n = 88)	18.9	<0.01*
Group E	22.8% (n = 1,522)	40.4% (n = 182)	70.4	<0.01*
GPA	3.11	3.30	4.99	<0.01*

Differences of Student Participation in Program and Activity Formats

The final research question of this chapter is if participant characteristics vary across different program and activity formats. There are five program formats including challenge, event, class, camp, and platform, and four activity formats including ideate, inform, attend, and advance. Appendix D-G include the tables for challenges, classes, events, and camps, respectively. There was a great deal of overlap in terms of program format and activity format. Table 3.5 is included to examine variation of the overall sample population, a unique program format and an activity format. The programs included are 10,000 Solutions and the Edson Student Entrepreneur Initiative. 10,000 Solutions was selected given that a great deal of this research has been focused on its management. It is the only platform included in the dataset, but its ideation activity was the most common activity of all open innovation programming. The Edson Student Entrepreneur Initiative was an event, of which there were many in this dataset. Edson is unique in that it is the only advancing activity, meaning that participants had an idea and the task of participation was to develop the idea further.

The first hypothesis for this research question was that different students would be drawn to different program and activity formats. Support for this hypothesis is observed. Pell eligibility is consistent between the overall sample and 10,000 Solutions at 36.0% and 34.1% respectively, then plummets in Edson to only 15.4%. Female participation follows a similar trend, with overall participation at 44.2%, 10,000 Solutions participation at 44.5%, and Edson participation at 19.5%. 10,000 Solutions has more undergraduate participants (85.6%)than Edson does (56.1%). The most represented college cluster group for both 10,000 Solutions and Edson was Group E: Technology & Innovation, Engineering. The second hypothesis for this research question was that there would not be a difference in

student success for students that participated in different programs or activities. This hypothesis was not confirmed. 77.9% of Edson participants graduated, as compared to 58.6% of 10,000 Solutions participants. Edson participants also had better grades at the high end of the spectrum; for example, students with GPA's higher than 4.0 were 29.4% for Edson participants and 21.0% for 10,000 Solutions.

Table 3.5: Participant Variation in Program and Activity Format

Variable	Overall	Ideation platform (10k)	Advancing event (Edson)
Pell Eligible	36.0%	34.1%	15.4%
Financial Aid Offered	89.1%	96.7%	100.0%
Resident	65.2%	68.1%	80.5%
Non-Resident	34.8%	31.9%	19.5%
Caucasian	51.5%	46.7%	61.0%
Hispanic	19.8%	19.2%	17.1%
African American	4.8%	7.4%	0.0%
Asian	7.0%	8.3%	9.8%
Male	55.8%	55.5%	80.5%
Female	44.2%	44.5%	19.5%
Graduated	32.2%	58.6%	77.9%
Retained	91.8%	98.3%	97.6%
Undergrad	95.2%	85.6%	56.1%
Graduate	4.8%	14.4%	43.9%
Full-Time	94.0%	89.5%	80.5%
Part-Time	6.0%	10.5%	19.5%
Group A	22.9%	26.2%	22.0%
Group B	12.2%	4.4%	4.9%
Group C	7.7%	3.1%	0.0%
Group D	28.6%	17.0%	14.6%
Group E	23.9%	34.9%	53.7%
Group F	4.7%	14.4%	4.9%
GPA 1 - 1.5	1.7%	1.8%	2.9%
GPA 1.5 - 2	3.8%	2.3%	0.0%
GPA 2 - 2.5	9.1%	5.9%	0.0%
GPA 2.5 - 3	16.8%	7.8%	5.9%
GPA 3 - 3.5	27.6%	29.2%	35.3%
GPA 3.5 - 4	26.3%	31.5%	26.5%
GPA >= 4	12.1%	21.0%	29.4%

*Sample populations Overall sample=7,125; 10k= 229, Edson=41. Null or missing values filtered for each cell

Discussion

The examination of the demographics of student participants provides an additional insight into the larger question about open innovation implementation at Arizona State University. It is encouraging that demographics of the participant sample resemble the demographics of the university student population. It indicates that open innovation programming has sufficient breadth across the university. The higher participation rates of Pell eligible participants was an interesting difference from the overall university population. The comparison of one time participants to repeat participants can be used as a success metric for Changemaker Central and the Office of University Initiatives. Though it is understood that many of these open innovation programs are optional, which introduces a self selection bias in the participant data, participating more does lead to higher educational attainment outcomes. There are some differences in participant demographics by program format that can be instructive for future programming. An easy first goal would be to increase female participation. It was interesting to note that Changemaker programming tended to have higher female participation rates than the Entrepreneurship and Innovation programming. At the same time, we know from the responses in Chapter 2 that the administrators at Entrepreneurship and Innovation were aware of lower female participation and changed some structural elements, in this instance raising the percentage of female judges, which increased female student participation. The presence of four campuses showed how offline participation can be a tool to increase the diversity of participants in terms of academic focus. This information can be used to encourage cross-campus, cross-discipline collaborations in future programming. There are opportunities to engage some of the college cluster groups that were not highly represented in this sample, specifically Group F- Design

& the Arts, Sustainability, Teachers College. If administrators use the insights gained from past experiences and approach these colleges with a goal of co-creating programming that emphasizes their specialization and cross-discipline collaboration, some unique programming can be developed. This demographic assessment is constructive in indicating next steps for design, management, and evaluation of innovation, entrepreneurship, and social engagement programming.

In addition to this research's contribution to the overall understanding of open implementation in an organization, the findings serve as an intermediary step in a larger research effort of studying impacts of participation. For instance, one of the next planned research projects after the dissertation is developing a control group from the student population. An effective control group construction requires a stratified sample, and the results of this demographic assessment can be used to decide what the stratification criteria should be. Another project that can extend this research is the use of choice modeling to determine why students prefer certain program or activity formats over another. Much like the objective of 10,000 Solutions, this research is a case study build that can inform future research and planning efforts at Arizona State University.

Conclusion

Review of Findings

The overall research question for this dissertation research was what administrators within a public organization have learned about the design, management, and evaluation of open innovation efforts. Within the context of the broad research question, I had three specific questions to study. The first research question asked about substantive findings in thematic areas of values, teamwork, and organizational culture and innovation practices that administrators learned in their work with open innovation. My preliminary takeaway of this question was that we now have a detailed case study for an organization who is proactively working to change the way it operates to realize its goals of innovation, collaboration, and applied problem solving from the perspective of administrators who are managing such efforts. The skill sets needed to thrive in an a first mover organization like Arizona State University are unique, such as the need to be comfortable with ambiguity, uncertainty, and discomfort, work regularly with diverse people and groups, learn how to design programs quickly, and how to deal with failure. The institutional support by the university was present in all of the administrator interviews, and illustrate that genuine commitment to efforts that will change the organization, not just lip service and half hearted investments, are absolutely vital in the success of open innovation adoption. It is observed that intermediary departments are a resource that can expand and advance open innovation without causing undue burden on administrators in more traditional departments. An administrative team, or teams that specialize in innovation have great value to creating this culture change within an organization.

The second research question asked about the extent to which different administrator groups aligned in their understanding of the three dimensions of values, teamwork, and organizational culture and innovation practices. In the particular case of 10,000 Solutions, the university administrator groups tended to be more aligned in their articulations of objectives, actions, stressors, and outcomes than anticipated at the outset of the study. What seemed to be more important than complete alignment between the groups was almost complete alignment, with the understanding that there wasn't complete alignment, with a shared cause, and trust in their collaborative partners. Unfortunately for the case of 10,000 Solutions, the external contractor was a substantial liability. A technological management team to design a participatory platform does not have to be internal to the organization for success, though it is helpful to have remove the iteration barrier of contract agreements. What is important for administrators to look for when seeking a design management team is an understanding of the programmatic goals, the desires of technology to enhance the programmatic goals, and provide thoughtful input and feedback into design changes made to a participatory platform.

The administrator alignment study illustrates that when it comes to innovation programming, some formats are much more complex and resource intensive than others. The management of a many-to-many participatory platform requires programmatic expertise, technical expertise, quick iteration, an effective collaborative environment, and sufficient staffing and financial resources to make necessary changes. I observed that it is extremely important to have the administrators who interact with the public on a daily basis, in this case it was the Changemaker intermediary staff, be more involved in any design changes to a platform like this, and have a much closer connection to the technical

management of the platform. Through the lessons gained from the 10,000 Solutions case, the technical team needs to understand the substantive and technical needs of a platform for it to be successful. While this case emphasized that the external nature of the contractor was a liability, another contractor may not be. The amount of learning gained by each participating administrator was immense compared to their starting point, and that this experience came with a great deal of fatigue. Planning for innovation integration in an organization needs to take a long view to reduce administrator burn out. This long view does not have to mean keeping a project like 10,000 Solutions going in perpetuity. The insights from Chapter 2 illustrate that administrators need to know that a project can be put to rest if ineffective or if it reaches the end of its lifecycle. Some criteria that can be used for indicating the need to end a project are lack of resources, lack of support from some to all of the collaborative management, more effective programmatic or online tools to advance the work in a different form, or extended lack of engagement of potential participants. Rather, administrators need to understand what behaviors are being created or strengthened through participation in the platform and program, continually seek to match design aspirations to design reality, and provide sufficient resources for administrators to complete the project they are asked to manage.

The third research question provided a demographic assessment of student participation in open innovation programming at Arizona State University. A first easy, yet important insight was that to understand the reach of innovation programming in an organization that is proactively integrating such practices into their work, looking at one department's programming will not be sufficient. There were twenty-one programs included in this demographic survey that were sponsored by two intermediary departments within the

same university. The demographics of student participants were encouraging in that they resembled the demographic profile of the university itself. As Arizona State University has expressly identified broad and diverse inclusion of students, that means that the programming included in the study is likewise reaching a broad and diverse student population. There were a few participation gap areas, such as relatively lower female participation than the university profile, which can provide insights for future programming. In addition, the college cluster profiles may indicate opportunities for new cross-discipline collaborations. Programming was offered in different formats, times, locations, and substantive tasks. This assessment showed that students who participate in these activities remain enrolled and continuing their studies.

The overall take away from my dissertation findings was that 1) intermediary departments and administrators facilitate the process of open innovation adoption as a bridging force of departmental silos but are internal to the organization, and 2) it is possible for this change to happen, happen effectively, and happen in a faster timeframe that people may have thought at the outset. It is important for administrators to understand the complexity of the task facing them, be willing to operate out of their comfort zones, be unafraid of smaller failures in service to the organizational goal, trust their collaborative partners, and keep focused on the core objectives of the organization itself. The use of diverse programming, technological tools, and administrators who specialize in creating innovation project will go a long way to empowering administrators to rise to the task of implementing open innovation in organizational operations.

Methodological Considerations

This dissertation research relied primarily on qualitative data from a case study, and theoretical pattern matching as the analytical approach. I feel that the use of qualitative analysis enabled me to capture a rich source of organizational learning about the design, management, and evaluation of open innovation within Arizona State University. The experiential knowledge gained by administrators in this case study is valuable to the field of open innovation and public administration as there are now articulations of objectives, strategies, and success metrics for managing open innovation programming. The success metrics from Chapter 2 illustrate that a binary or limited dimension evaluation tool is insufficient for understanding organizational learning and cultural change. The addition of the demographic survey provided a different analytical lens to the study of open innovation participation. While the experiences of administrators is extremely valuable, that information alone is not enough to understand the phenomenon of an organization integrating open innovation practices. The demographic survey addresses one of the next questions that could be included in an assessment- the coverage of open innovation programming to the large and diverse student body of Arizona State University.

The strength of using different analytical tools is the researcher can look back and forth between the findings generated from each tool to gain insight about the overall effort. For instance, the demographic survey shows that there were many more one-time participants than repeat participants; the administrator interviews thoughtfully address what they thought was missing in the participatory programming or platform design that didn't encourage students to return, which was the call for participation aligning with student interest. Much as administrators spoke about iterative design, the use of multiple

methodologies and data sources allow for iterative research that can improve design. A challenge to be addressed in future research is how to measure someone's capacity as a master learner. The open innovation activities are not aspiring to teach students to be good at that one activity, but rather to know how to use a variety of skills and work with others to solve real world challenges. Continued thought on the use of analytical methods and iterative study will be necessary to study issues of this nature.

Future Research

There are two directions in which I would like take this research to continue the study of open innovation implementation by organizations. The first is to continue a deep dive, which would more fully illuminate all the different people and programs at play, thereby allowing for a more comprehensive evaluation. Within the objective of deepening the case study, a priority participant group to interview would be the student participants themselves. I purposely constrained my dissertation research to studying administrators who manage open innovation, entrepreneurship, and social engagement programs. Without these individuals, there would be no working interface between an organization and its respective public. However, administrator objectives, management, and evaluation is, and must be, constrained by organizational priorities and needs. Therefore, administrators are naturally more likely to think about public participation in terms of how this participation can improve the service of the organization. To continue expanding the case study, I would be interested in following up with student participants who participated in the programming included in this dissertation. Student participants are not constrained by organizational prerogatives in their thoughts on open innovation. It is far too easy for public administration scholars to think about participation primarily from the view of the public organization; to

best understand what participatory programs are creating, it is best to not combine evaluations of administrators and participants. Of particular interest would be reflection on what the experience of participation taught them, and if any of the ideas developed during that participation has continued to develop into action. I would create a unique interview protocol with theoretical concepts and propositions that are consistent with public participation literature. In addition to learning the results of this study for its own sake, an additional study on alignment could take place.

Another component to deepen the case study is the comparison of ideation activities, what was included in this dissertation, with other types of participatory engagement. For instance, many students participate in student government at the university level or on advisory committees within departments and centers. Other students engage in citizen science research, and still others are involved in clubs and groups that make up the social fabric of the university culture. By interviewing these different participant groups with the same interview protocol, we could learn what the student participants gain from different types of engagement at Arizona State University.

The second direction in which this research can be expanded is to broaden it beyond the scope of this case study. An easy and fascinating first step would be to replicate the interview process with administrators in a variety of public sector settings. This would provide insights into how applicable the Arizona State University administrator responses are to the larger field of public administration. An additional opportunity to broaden this research would be to design and test an online feedback system for ideation. One of the biggest unfulfilled wishes of 10,000 Solutions administrators was a reliable way to send ideas to administrators within the university and have them respond. A key consideration for a

feedback system like this would be how to design genuine feedback for participants without causing an undue burden on administrators who do have other responsibilities that must be addressed to be successful at their jobs.

A final future research objective is to create a new opportunity of participatory action research to study how to get to open governance. This dissertation focused on the ideation and informing actions that are present in open innovation, as that is what is most prevalent at the moment. The objectives of the Open Government Movement are to make government more transparent, participatory, and collaborative ("Open Government Directive," 2009; White House, 2009). It can be argued that transparency and participation is being experimented with a variety of tools and tasks in different sectors. However, there are very few instances, especially at a larger scale, of collaborative decision making. The next phase of research is then, how do we get to collaborative governance of public sector organizations, and what is the role of technology in creating collaborative governance? Continued participatory action research will encourage continued development of experimentation by organizations, learning how to improve the process of collaborative engagement, and, perhaps, creating new opportunities for people to contribute to their communities in constructive ways.

REFERENCES

Agogue, M., Ystrom, A., & Le Masson, P. (2013). Rethinking the Role of Intermediaries as an Architech of Collective Exploration and Creation of Knowledge in Open Innovation. *International Journal of Innovation Management*, *17*(2), 1350007. http://doi.org/10.1142/S1363919613500072

Alexander, J. A., Comfort, M. E., & Weiner, B. J. (1998). Governance in Public-Private Community Health Partnerships: A Survey of the Community Care Network SM Demonstration Sites. *Nonprofit Management and Leadership*, *8*(4), 311–332. http://doi.org/10.1002/nml.8402

Allison, G., & Zelikow, P. (1999). *Essence of Decision: Explaining the Cuban Missile Crisis* (2nd ed.). Pearson.

Ansell, C., & Gash, A. (2008). Collaborative Governance in Theory and Practice. *Journal of Public Administration Research and Theory*, *18*(4), 543–571. http://doi.org/10.1093/jopart/mum032

Argyris, C. (1976). Single-Loop and Double-Loop Models in Research on Decision Making. *Administrative Science Quarterly*, *21*(3), 363–375. http://doi.org/10.2307/2391848

Argyris, C., & Schon, D., A. (1974). *Theory in Practice: Increasing Professional Effectiveness* (1 edition). San Francisco: Jossey-Bass.

Argyris, C., & Schön, D. A. (1997). Organizational Learning: A Theory of Action Perspective. *Reis*, (77/78), 345–348. http://doi.org/10.2307/40183951

Arizona Board of Regents. (2014). *Impacting Arizona. Transforming the World: Arizona Board of Regents FY 2014 in Review*. Retrieved from http://www.azregents.edu/reports/default.aspx

Arizona State University. (2014a). Enrollment Trends by College and Dept. Retrieved July 9, 2016, from https://facts.asu.edu/Pages/Enrollments/Enrollment-Trends-by-College-and-Dept.aspx

Arizona State University. (2014b, August 20). Record 82,000 students choose ASU. Retrieved May 13, 2016, from https://asunow.asu.edu/content/record-82000-students-choose-asu

Arizona State University. (2016a). About Michael M. Crow | Office of the President. Retrieved May 8, 2016, from https://president.asu.edu/about/michaelcrow

Arizona State University. (2016b). ASU Foundation. Retrieved June 20, 2016, from http://www.asufoundation.org/about-us

Arizona State University. (2016c). Design Aspirations | New American University. Retrieved May 12, 2016, from https://newamericanuniversity.asu.edu/about/design-aspirations

Arizona State University. (2016d). Educational Outreach & Student Services | Educational Outreach and Student Services. Retrieved June 20, 2016, from https://eoss.asu.edu/

Arizona State University. (2016e). Entrepreneurship & Innovation. Retrieved June 20, 2016, from https://entrepreneurship.asu.edu/about

Arizona State University. (2016f). Office of University Initiatives. Retrieved June 20, 2016, from https://ui.asu.edu/index.php

Arizona State University Office of Institutional Analysis. (2015). Quick Facts: Fall 2014. Retrieved July 6, 2016, from https://uoia.asu.edu/content/quick-facts

Ashoka Changemakers. (2012). Retrieved July 24, 2012, from http://www.changemakers.com/main

Astin, A. W. (1977). *Four Critical Years: Effects of College on Beliefs, Attitudes, and Knowledge* (1 edition). San Francisco, Calif.: Jossey-Bass.

Astin, A. W. (1984). Student Involvement: A Development Theory for Higher Education. *Journal of College Student Development*, *40*, 518–529. Retrieved from https://www.researchgate.net/publication/220017441_Student_Involvement_A_Development_Theory_for_Higher_Education

Bakici, T., Almirall, E., & Wareham, J. (2013). The role of public open innovation intermediaries in local government and the public sector. *Technology Analysis & Strategic Management*, *25*(3), 311–327. http://doi.org/10.1080/09537325.2013.764983

Bozeman, B. (2000). Technology transfer and public policy: a review of research and theory. *Research Policy*, *29*(4–5), 627–655. http://doi.org/10.1016/S0048-7333(99)00093-1

Cassidy, S., & Eachus, P. (2000). Learning Style, Academic Belief Systems, Self-report Student Proficiency and Academic Achievement in Higher Education. *Educational Psychology*, *20*(3), 307–322. http://doi.org/10.1080/713663740

Challenge.gov. (2015). Retrieved from http://challenge.gov/

Changemaker Central. (2016). Retrieved June 20, 2016, from https://changemaker.asu.edu/about

Chesbrough, H. (2006). *Open Business Models: How to Thrive in the New Innovation Landscape* (1 edition). Boston, Mass: Harvard Business Review Press.

Chesbrough, H. W. (2005). *Open Innovation: The New Imperative for Creating And Profiting from Technology* (First Trade Paper Edition edition). Boston, Mass.: Harvard Business Review Press.

Cohn, J. P. (2008). Citizen Science: Can Volunteers Do Real Research? *BioScience*, *58*(3), 192–197. Retrieved from http://www.jstor.org/stable/10.1641/B580303

Coleman, S., & Gotze, J. (2001). *Bowling Together: Online public engagement in policy deliberation.* London: Hansard Society. Retrieved from http://catedras.fsoc.uba.ar/rusailh/Unidad%207/Coleman%20and%20Gotze%20Bowling%20Together,%20online%20public%20engagement%20in%20policy%20deliberation.pdf

Cresswell, A. M., Canestraro, D. S., Gil-García, J. R., Pardo, T. A., & Schneider, C. (2004). Interorganizational information integration: Lessons from the field. In *65th ASPA National Conference, Portland, OR* (Vol. 196).

Crow, M. (2016a). ASU GSV Summit Keynote Address. Retrieved May 3, 2016, from http://livestream.com/asugsvsummit/events/5043691/videos/120325625

Crow, M. (2016b, July 7). Change the World? Create a Culture of Innovation. Retrieved July 9, 2016, from https://www.linkedin.com/pulse/change-world-create-culture-innovation-michael-crow

Crow, M. M., & Dabars, W. B. (2015). *Designing the New American University* (1 edition). Baltimore, Maryland: Johns Hopkins University Press.

Cuthill, M., & Fien, J. (2005). Capacity building: Facilitating citizen participation in local governance. *Australian Journal of Public Administration*, *64*(4), 63–80. http://doi.org/10.1111/j.1467-8500.2005.00465a.x

Dawes, S. S., & Helbig, N. (2010). Information Strategies for Open Government: Challenges and Prospects for Deriving Public Value from Government Transparency. In M. A. Wimmer, J.-L. Chappelet, M. Janssen, & H. J. Scholl (Eds.), *Electronic Government* (pp. 50–60). Springer Berlin Heidelberg. Retrieved from http://link.springer.com.ezproxy1.lib.asu.edu/chapter/10.1007/978-3-642-14799-9_5

Etzkowitz, H., & Leydesdorff, L. (2000). The dynamics of innovation: from National Systems and "Mode 2" to a Triple Helix of university–industry–government relations. *Research Policy*, *29*(2), 109–123. http://doi.org/10.1016/S0048-7333(99)00055-4

Etzkowitz, H., Webster, A., Gebhardt, C., & Terra, B. R. C. (2000). The future of the university and the university of the future: evolution of ivory tower to

entrepreneurial paradigm. *Research Policy*, *29*(2), 313–330. http://doi.org/10.1016/S0048-7333(99)00069-4

Faller, M. B. (2016, March 11). ASU setting path "Toward a More Perfect University." Retrieved April 7, 2016, from https://asunow.asu.edu/20160311-solutions-asu-setting-path-toward-more-perfect-university

Fung, A. (2006). Varieties of Participation in Complex Governance. *Public Administration Review*, *66*, 66–75. http://doi.org/10.1111/j.1540-6210.2006.00667.x

Gee, J. P., & Hayes, E. (2012). Nurturing Affinity Spaces and Games-Based Learning. In C. Steinkuehler, K. S. Ph.D, & S. B. Ph.D (Eds.), *Games, Learning, and Society: Learning and Meaning in the Digital Age* (1 edition, pp. 129–153). Cambridge: Cambridge University Press.

Gothelf, J., & Seiden, J. (2013). *Lean UX: Applying Lean Principles to Improve User Experience* (1 edition). O'Reilly Media.

Gottschalk, P. (2009). Maturity levels for interoperability in digital government. *Government Information Quarterly*, *26*(1), 75–81. http://doi.org/10.1016/j.giq.2008.03.003

Harrison, T. M., Pardo, T. A., & Cook, M. (2012). Creating Open Government Ecosystems: A Research and Development Agenda. *Future Internet*, *4*(4), 900–928. http://doi.org/10.3390/fi4040900

Harvey, J. B. (1988). The Abilene paradox: The management of agreement. *Organizational Dynamics*, *17*(1), 17–43. Retrieved from http://www.sciencedirect.com.ezproxy1.lib.asu.edu/science/article/pii/0090261688900289

Hayes, J., & Allinson, C. W. (1998). Cognitive style and the theory and practice of individual and collective learning in organizations. *Human Relations*, *51*(7), 847–871. Retrieved from http://search.proquest.com.ezproxy1.lib.asu.edu/docview/231468569/abstract

Heywood, J. (2009). *The big idea my brother inspired*. Presented at the Technology, Entertainment, Design. Retrieved from http://www.ted.com/talks/jamie_heywood_the_big_idea_my_brother_inspired.html

Howells, J. (2006). Intermediation and the role of intermediaries in innovation. *Research Policy*, *35*(5), 715–728. http://doi.org/10.1016/j.respol.2006.03.005

iMesa. (2013). Retrieved from http://www.mesaaz.gov/imesa/

Innes, J. E., & Booher, D. E. (2005). Reframing Public Participation: Strategies for the 21st Century. Retrieved from http://escholarship.org/uc/item/4gr9b2v5

Institute for the Future. (2011). Superstruct. Retrieved from http://archive.superstructgame.net/

Jones, B. D. (2001). *Politics and the Architecture of Choice: Bounded Rationality and Governance*. Chicago: University Of Chicago Press.

Kelley, T. M., & Johnston, E. (2012). Discovering the appropriate role of serious games in the design of open governance platforms. *Public Administration Quarterly*.

Khatib, F., DiMaio, F., Group, F. C., Group, F. V. C., Cooper, S., Kazmierczyk, M., … Baker, D. (2011). Crystal structure of a monomeric retroviral protease solved by protein folding game players. *Nature Structural & Molecular Biology*, *18*(10), 1175–1177. http://doi.org/10.1038/nsmb.2119

King, C. S., Feltey, K. M., & Susel, B. O. (1998). The Question of Participation: Toward Authentic Public Participation in Public Administration. *Public Administration Review*, *58*(4), 317–326. http://doi.org/10.2307/977561

Kivimaa, P. (2014). Government-affiliated intermediary organisations as actors in system-level transitions. *Research Policy*, *43*(8), 1370–1380. http://doi.org/10.1016/j.respol.2014.02.007

Learmonth, G. P., Smith, D. E., Sherman, W. H., White, M. A., & Plank, J. (2011). A practical approach to the complex problem of environmental sustainability: the UVa Bay Game. *The Innovation Journal: The Public Sector Innovation Journal*, *16*(1). Retrieved from http://www.innovation.cc/scholarly-style/learmonth_sustain_inviroment_v16i1a4.pdf

MAXQDA 12.1.3. (2015). Discover the new features of MAXQDA. Retrieved May 13, 2016, from http://www.maxqda.com/products/new-in-maxqda-12

McNeal, R., Hale, K., & Dotterweich, L. (2008). Citizen–Government Interaction and the Internet: Expectations and Accomplishments in Contact, Quality, and Trust. *Journal of Information Technology & Politics*, *5*(2), 213–229. http://doi.org/10.1080/19331680802298298

Mezirow, J. (1991). *Transformative Dimensions of Adult Learning*. Jossey-Bass, 350 Sansome Street, San Francisco, CA 94104-1310 ($27.95). Retrieved from http://eric.ed.gov/?id=ED353469

Monotti, A., & Ricketson, S. (2003). *Universities and Intellectual Property: Ownership and Exploitation* (SSRN Scholarly Paper No. ID 1162437). Rochester, NY: Social Science Research Network. Retrieved from http://papers.ssrn.com.ezproxy1.lib.asu.edu/abstract=1162437

Mossberger, K. (2000). *The Politics of Ideas and the Spread of Enterprise Zones*. Georgetown University Press.

Mossberger, K., Tolbert, C. J., & McNeal, R. S. (2007). *Digital citizenship: The internet, society, and participation*. MIT Press.

MyPlanPHX. (2013). Retrieved April 27, 2013, from http://www.myplanphx.com/

No, W., Mook, L., & Schugurensky, D. (Forthcoming). Concurrent or Integrated Hybridity? Exploring Offline and Online Citizen Participation in Invited Spaces. *Journal of Organizational Theory and Behavior*.

Noveck, B. S. (2012). Demand a more open-source government | Video on TED.com. Presented at the Technology, Entertainment, Design. Retrieved from http://www.ted.com/talks/beth_noveck_demand_a_more_open_source_government.html

Noveck, B. S. (2015). Smart Citizens, Smarter State: The Technologies of Expertise and the Future of Governing: Beth Simone Noveck: 9780674286054: Amazon.com: Books. Retrieved July 8, 2016, from https://www.amazon.com/Smart-Citizens-Smarter-State-Technologies/dp/0674286057/ref=sr_1_1?ie=UTF8&qid=1467999748&sr=8-1&keywords=beth+noveck

Office of the President. (2015). *New American University: 2015 and Beyond*. Arizona State University. Retrieved from https://president.asu.edu/about/asucharter

Open Government Directive. (2009). Retrieved February 6, 2013, from http://www.whitehouse.gov/open/documents/open-government-directive

OpenIDEO. (2013). Retrieved July 8, 2016, from https://openideo.com/

O'Reilly, T. (2010). Government as a Platform. In D. Lathrop & L. Ruma (Eds.), *Open government: Collaboration, transparency, and participation in practice* (pp. 11–39). Sebastopol, CA: O'Reily Media Inc.

Page, S. E. (2008). *The Difference: How the Power of Diversity Creates Better Groups, Firms, Schools, and Societies* (New edition with a New preface by the author edition). Princeton: Princeton University Press.

Pardo, T. A., Nam, T., & Burke, G. B. (2011). E-Government Interoperability: Interaction of Policy, Management, and Technology Dimensions. *Social Science Computer Review*, 894439310392184. http://doi.org/10.1177/0894439310392184

Pardo, T. A., & Scholl, H. J. (2002). Walking atop the cliffs: avoiding failure and reducing risk in large scale e-government projects. In *Proceedings of the 35th Annual Hawaii*

International Conference on System Sciences, 2002. HICSS (pp. 1656–1665). http://doi.org/10.1109/HICSS.2002.994076

Pardo, T. ., Gil-Garcia, J. R., & Burke, G. B. (2008). Governance Structures in Cross-Boundary Information Sharing: Lessons from State and Local Criminal Justice Initiatives. In *Hawaii International Conference on System Sciences, Proceedings of the 41st Annual* (pp. 211–211). http://doi.org/10.1109/HICSS.2008.185

Peristeras, V., & Tarabanis, K. (2000). Towards an enterprise architecture for public administration using a top-down approach. *European Journal of Information Systems*, *9*(4), 252–260.

Plott, C. R. (1976). Axiomatic Social Choice Theory: An Overview and Interpretation. *American Journal of Political Science*, *20*(3), 511–596. http://doi.org/10.2307/2110686

Plott, C. R. (1991). Will Economics Become an Experimental Science? *Southern Economic Journal*, *57*(4), 901–919. http://doi.org/10.2307/1060322

Schaffers, H., Komninos, N., Pallot, M., Trousse, B., Nilsson, M., & Oliveira, A. (2011). Smart Cities and the Future Internet: Towards Cooperation Frameworks for Open Innovation. In *The Future Internet, Future Internet Assembly 2011: Achievements and Technological Promises* (pp. 431–446). Springer.

Simon, H. A. (1997). *Administrative Behavior, 4th Edition* (4 Sub). Free Press.

Smith, G. (2009). *Democratic Innovations: Designing Institutions for Citizen Participation - Theories of Institutional Design* (1st ed.). New York, NY, USA: Cambridge University Press.

Spent. (2014). Retrieved from http://playspent.org/

Stewart, J., & Hyysalo, S. (2008). Intermediaries, Users and Social Learning In Technological Innovation. *International Journal of Innovation Management*, *12*(3), 295–325. http://doi.org/10.1142/S1363919608002035

Surowiecki, J. (2005). *The Wisdom of Crowds*. New York, NY: Anchor Books.

Tödtling, F., Lehner, P., & Kaufmann, A. (2009). Do different types of innovation rely on specific kinds of knowledge interactions? *Technovation*, *29*(1), 59–71. http://doi.org/10.1016/j.technovation.2008.05.002

Treisman, C., Johnston, E. W., Kelley, T. M., & Krishnamurthy, R. (2013). *Participatory Platforms with a Public Intent: Critical reflection and future practices*. Phoenix, AZ: Center for Policy Informatics, Arizona State University.

van Lente, H., Hekkert, M., Smits, R., & van Waveren, B. (2003). Roles of Systemic Intermediaries in Transition Processes. *International Journal of Innovation Management*, *7*(3), 247–279. http://doi.org/10.1142/S1363919603000817

We the People. (2013). Retrieved from https://petitions.whitehouse.gov/

Weber, M. (1978). *Economy and Society: An Outline of Interpretive Sociology*. (G. Roth & C. Wittich, Eds.) (New Ed edition). Berkeley: University of California Press.

White House. (2009). *Memorandum of Transparency and Open Government*. White House. Retrieved from http://www.whitehouse.gov/the_press_office/TransparencyandOpenGovernment

XPRIZE. (2013). Retrieved July 8, 2016, from http://www.xprize.org/

Zimmerman, B. J. (1990). Self-Regulated Learning and Academic Achievement: An Overview. *Educational Psychologist*, *25*(1), 3–17. http://doi.org/10.1207/s15326985ep2501_2

APPENDIX A

THEORETICAL PATTERN MATCHING PROCESS MAP

Concept	Definition	Source	Interview Question	Concept Prediction	Alignment Prediction
Design Stages					
Organizational outcomes	Organizational outcomes are the combination of an institution and its preferences	Plott, 1976, 1991, 8	What was your participatory platform or program intended to accomplish within the workings of your organization? Within ASU?	The New American University mission and design values will be prominent in the responses of administrators, and will also be consistent with the mission of the department in which they operate.	Each department will have a slightly different articulation of the purpose of 10,000 Solutions within the department and within the university. Alignment of administrators within department groups in anticipated.
Governing variable	Governing variables are values that administrators strive to keep within an acceptable range through their actions	Argyris & Schön, 1974, 7	What values and actions were important to promote through the use of your participatory platform or program?	administrators will emphasize an objective of active participation or learning.	administrators will share values and actions that are consistent with their articulation of the organizational outcomes. I do not anticipate different responses from staff and manager administrators.
Action strategies	Action strategies are intended to keep governing variables in an acceptable range.	Argyris & Schön, 1974, 7	How did the design and management of your participatory platform or program realize the values and actions you articulated?	Administrators will articulate how the design of the innovation effort contributed to the organizational outcome.	Administrators will have a consistent understanding of the design of 10,000 Solutions, based on the time they were involved. Administrators involved earlier in the lifecycle will know about the first design iteration, whereas administrators involved throughout will understand both

Satisficing	people need to know just enough to make a decision, not knowing every possible piece of information or option as would be expected in rational decision making.	Simon, 1997, 7	How did your team draw boundaries on how much research and learning was necessary about participatory platforms or programs before you began the design or management of your own platform?	Administrators for the most part did a minimal amount of research before designing and managing their effort.	Intermediary administrators did far more research and planning than the leadership administrators. At the same time, a consistent response of experimentation is anticipated due to the novelty of a participatory platform.
Single loop learning	Single loop learning indicates when an organization makes changes that are consistent with its existing norms and practices	Simon, 1997, 7	Were there design changes needed to your platform to realize the objective of your platform or program? If so, what were those changes?	A majority of the insights to this question, and the interview itself, will be reflective of single loop learning. This is due to the fact that the larger normative change within ASU was the development of the new charter, which occurred prior to any of the efforts included in this study.	Intermediary managers and staff have the best understanding of needs from the first platform iteration and the design changes made in the second iteration.
Consequences	Consequences in this case are indicative of actions that have intended and unintended consequences	Argyris & Schön, 1974, 7	How successful was the design and management of your platform or program at realizing your values and action objectives? How do you measure success?	Generally positive assessments for projects or programs that were simple in design are anticipated; as design complexity increases, more mixed results are anticipated.	Administrators with greater proximity to management of the platform, administrator assessment of 10,000 Solutions will become more detailed and more negative in assessment.

Teamwork					
Past experiences	Past experiences, both professional and personal are important aspects of what a team member brings to a collective effort	Jones, 2001, 7	What professional and personal experiences did your team have that was helpful for the management of the platform or program? Were there any past experiences (or lack thereof) that were unhelpful?	It is not anticipated that specific training in innovation or online technological skills will be highlighted in responses. Of more impact will be administrator experiences with substantive innovation areas and the ability to manage such efforts.	There will be high amounts of alignment of this question from all administrators, regardless of department or role. This is due to the novelty of 10,000 Solutions as a participatory platform.
Skills matching	Skills match indicates individuals with particular cognitive and technological skills, and the jobs they are assigned to complete, has a large impact on organizational learning	Hayes & Allinson, 1998, 8	What skills were needed to design and manage your participatory platform or program? Did you need to develop a new strategy for managing these platforms? How did your team and (if applicable) your partners divvy up those responsibilities?	Administrators with open innovation experience will have a strong sense of the skills needed to successfully run a project or program.	Administrators with daily managerial roles for 10,000 Solutions will have a richer description of what is needed on a team. These will primarily be intermediaries as they have the job of design and management of the platform.

Interoperability	Interoperability is the property of a system that allows different groups to communicate, collaborate, and coordinate in the execution of an effort	Cresswell et al. (2004); Gottschalk, 2009); (Pardo et al., 2011, 6); (Schaffers et al., 2011); Peristeras & Tarabanis, (2000).	How did the different groups managing your participatory platform or program communicate, coordinate, and collaborate? What would you say these groups were good at doing together Were there times where the groups had different or conflicting ideas of what needed to be done?	Interoperability is vitally important for the outcome of each innovation effort. It is anticipated that this question can be a way of assessing how the administrators themselves are becoming master learners of innovation practices.	All partners value and appreciate each other. All partners will express that collaboration was not perfect, and there were issues limiting effective management. Administrators internal to the university will express frustration with the external contractor.
Organizational learning	Organizational learning is when human institutions are influenced to change both by external pressures and internal efforts of individuals; this change in turn influences different expectations of individuals and conceptions of institutional capacity	Jones, 2001, 7	What did your team learn about itself through the experience of running your participatory platform or program? What did your team learn about ASU through the experience of running your platform or program?	Administrators will have a better understanding of what is required to make an impact within the university.	All administrators will have a better understanding of facilitating a bottom up effort at the university. Intermediaries will have a substantially expanded expertise of what it takes to run a participatory platform like 10,000 Solutions. More fatigue is expected from intermediary administrators than leadership administrators.

Innovation Culture					
Double loop learning	Double loop learning indicates changes being made to behavior including scrutiny and willingness to change established norms, practices, and goals	Argyris & Schön, 1974, 7	Has the management of participatory platforms or programs caused reflection or changes to the goals, norms, or practices of ASU?	Administrators will articulate their contribution more in service to the existing structure of the organization than in changing it. This is likely unique to this case, as ASU made an organizational objective to include innovation in its work prior to any innovation efforts. Therefore, the double loop learning is indicated through the existence of these efforts rather than the other way around.	Administrative leaders will express more impact of their work on shifting the goals of the university than intermediary administrators. It is anticipated that consensus from administrators across the board will be that the impact of 10,000 Solutions was useful but small in effect
Organizational, political, & bureaucratic factors	Organizational and political bureaucratic factors asserts that individuals and organizations learn in connection with their environmental context	Allison & Zelikow, 1999, 7	Are there aspects of the institutional culture at ASU that helped with this project? Other aspects that made it difficult? Were there examples or individuals outside of ASU who influenced this project? Are there things that were happening within ASU that influenced this effort?	Administrators will find the institutional culture of ASU to be a driving force in their work, experience running the innovation effort, and how they evaluate their experiences. Regarding influential people, internal organizational individuals will be more influential than external individuals.	Administrators will articulate this collaborative management of 10,000 Solutions as a result of the institutional culture of ASU.

Transformative learning	Transformative learning includes evolving practices and decisions lead to a transformation of the individual making decisions within an organization, or the organization itself	Mezirow, 1991, 7	Has the management of your platform or program changed the way you think about innovation and collaboration at ASU? If so, what changes do you see in the future?	Administrators will articulate a more sophisticated understanding of what is necessary to manage an open innovation effort within an organization. In particular, they will emphasize the complexity of management of such platforms and programs.	Intermediaries will express a deeper understanding of their own mission in their department resulting from the experience gained from 10,000 Solutions. Administrative leaders will articulate evolving understanding of using participation activities like 10,000 Solutions to connect with the student body.

APPENDIX B

INTERVIEW PROTOCOL

Values
• What was your program or platform intended to accomplish within the workings of your organization? Within ASU?
• What values and actions were important to promote through the use of your program or platform?
• How did the design and management of your program or platform realize the values and actions you articulated?
• How did your team draw boundaries on how much research and learning was necessary about participatory programs or platforms before you began the design or management of your own platform?
• Were there design changes needed to your program or platform to realize the stated objective? If so, what were those changes?
• How successful was the design and management of your program or platform at realizing your values and action objectives? How do you measure success?
• Anything else to add?
Teamwork
• What professional and personal experiences did your team have that was helpful for the management of the program or platform? Were there any past experiences (or lack thereof) that were unhelpful?
• What skills were needed to design and manage your program or platform? Did you need to develop a new strategy for managing these platforms? How did your team and (if applicable) your partners divvy up those responsibilities?
• How did the different groups managing your participatory platform communicate, coordinate, and collaborate to make the platform work? What would you say these groups were good at doing together (exp: same vision, shared understanding of resources needed)? Were there times where the groups had different or conflicting ideas of what needed to be done?
• What did your team learn about itself through the experience of running your program or platform? What did your team learn about ASU through the experience of running your program or platform?
• Anything else to add?
Arizona State University Culture and Innovation
• Has the management of participatory programs or platforms caused reflection or changes to the goals, norms, or practices of ASU?
• Are there aspects of the institutional culture at ASU that helped with this project? Other aspects that made it difficult?
• Were there examples or individuals outside of ASU who influenced this project? Are there things that were happening within ASU that influenced this effort?

• Has the management of your program or platform changed the way you think about innovation and collaboration at ASU? If so, what changes do you see in the future?
• Anything else to add?
Wrap- up Questions
1. Do you have any final thoughts to add to this interview?
2. Would you like to review the transcript of this interview prior to my analysis? You will be welcome to clarify anything said or add additional thoughts.
3. Is there any other administrator you recommend I include in this study?
4. Are there any documents, such as annual reports or publicity materials, that you would like to share with me for inclusion in this analysis?

APPENDIX C

ADMINISTRATOR MISALIGNMENT

Issue Discussed	Point of View	Response
Back End Functionality	External Contractor	Developing a redesign is all about the architecture. People don't realize the values of a platform architecture. Anybody can smash code on things, but, how good that system will be or how long it is going to last is based on how solid that architecture is. If it's very logical and it's extendable, the system will last a very long time. Like grabbing it, leaving a view of content by x amount of views, or looking at this or that is what architecture is solid enough it will just work with adding that view, or way for that functionality on top of it, where, if it didn't have any from the get go, you would be in a very, very bad situation where you're going back and refab the core of a system, you know. That is when, from like a nontechnical situation, they are looking at the platform and saying, "oh, there's no admin view", then we're say, "oh, no big deal because you could just add them here, here and here, you know. Like that's, 'cause it's, the information is already stored to use, you just have to extend it to a display.
Back End Functionality	Research Team	The contractor thought 10,000 Solutions was just a hosting sight, that all you needed to do was to provide different pages that had different types of content to it, but without back end combination. There was one specific sort of instance I remember, because I have a computer science background, their them telling us that it would not be possible to do a certain functionality, and then us coming up with a solution to that functionality. I believe it was something along the lines of, you don't have to host an individual website, you can link it to another thing by using a specific object, and that would allow for the same types of functionality. But at that point it became clear that they were not sophisticated when it came to sort of robust spec and architecture. Back ends enable the types of behaviors that can take place onto the website. A well-structured community, a well-structured sort of architecture, enables a lot of the things that we thought were necessary to build the communities that we needed to allow for people to be able to be aware of where they were within this larger community for collective participation or action to take place. They did not have the back end stuff that allowed for either the data analysis or the profiles, or the connection between multiple threads and themes, or the building of, you know, multiple people participating in one place.
Functionality for Research on Platform	External Contractor	Yeah, but I don't remember exactly what. I think it wasn't super clear, other than we were trying to get them access to the database so they could do the research. I remember it being like, "Okay, well where is this stuff?" And maybe the idea, one of the things we run into with that, with the frameworks is like people that develop like more simplistic stuff, they'll go in and they'll just want to see like one table of like an Excel spreadsheet of all the information that's in there. The framework is more of a giant spider web of data that you have to go grab. So you have to know the framework because you have to know where to go get it. I remember that being a case, and I said, "Here's the database, good luck with that." I don't know, I think they were able to figure it all out. But that takes a little bit of looking around.

Functionality for Research on Platform	Research Team	I don't think that we were able to answer many of the research questions that we wanted to because we were not able to run the real time experiments because of a lack of technical sophistication in terms of what was happening. There were some amazing stuff designed that would present different views of solutions based on individual participant activity. We had talked about different ways bringing groups together in real time to show people where they were within the ecosystem of 10,000 Solutions, and none of these were able to be realized by the technical infrastructure.

APPENDIX D

FALL 2014 QUICK FACTS - ARIZONA STATE UNIVERSITY

QUICK FACTS
ARIZONA STATE UNIVERSITY — Fall 2014

Headcount Enrollment[1]

ASU unduplicated total	83,301
ASU at the Tempe campus	67,446
ASU at the West campus	14,546
ASU at the Polytechnic campus	12,290
ASU at the Downtown Phoenix campus	22,105

Student Level

Undergraduates	67,507	81.0%
Graduate Students	15,794	19.0%

Residency

Residents	49,940	60.0%
Nonresidents	33,361	40.0%

Gender

Undergraduates		
Men	34,320	50.8%
Women	33,187	49.2%
Graduate Students		
Men	7,874	49.9%
Women	7,920	50.1%

Full-time/Part-time

Undergraduates		
Full-time	55,326	82.0%
Part-time	12,181	18.0%
Graduate Students		
Full-time	10,064	63.7%
Part-time	5,730	36.3%

New Undergraduates

First-time Freshmen	11,079
From Arizona High Schools	6,152
New Transfers	9,363
From Maricopa Community Colleges	3,835
From Other Arizona Community Colleges	552
New Nondegree-seeking	584

Race/Ethnicity	Undergrad		Grad	
Am. Indian/Alaska Native	1,047	1.6%	219	1.4%
Asian	3,889	5.8%	676	4.3%
Black/African American	3,355	5.0%	647	4.1%
Hispanic/Latino	13,626	20.2%	1,673	10.6%
Native Hawaiian/Pacific Islander	211	0.3%	23	0.1%
Two or more races	2,603	3.9%	323	2.0%
Total Minority	24,731	36.6%	3,561	22.5%
White	37,419	55.4%	7,988	50.6%
International	4,764	7.1%	4,087	25.9%
Unknown	593	0.9%	158	1.0%

Student Credit Hours and Full-Time Equivalent

	SCH	FTE
Lower-division	489,913	32,661
Upper-division	419,854	34,988
Graduate	136,053	13,605
Total	1,045,820	81,254

Undergraduate Costs (2014-15)

Resident tuition and fees (admitted Fall 2014)	$10,157
Nonresident tuition and fees (admitted Fall 2014)	$24,503
Room and Board	$9,575
Books and Supplies	$1,060

Degrees Awarded (AY 2013 –14)

Baccalaureate	14,381
Masters	4,584
Doctoral	596
Law	200
Total Degrees Awarded	19,761

Persistence and Graduation Rates

First-time Full-time Freshmen	
First-year Retention Rate (Fall 2013 cohort)	84%
6-Year Graduation Rate (Fall 2008 cohort)	63%
4-Year Graduation Rate (Fall 2010 cohort)	49%

First– Time Full-Time Freshman Credentials

Average High School GPA	3.41
Average High School Rank	27.1%
Average SAT	1113
Average ACT	24.3

First-Time Freshman Scholars

National Merit Scholars	117
President's Award	1,132
Provost's Award	1,464
Dean's Award	2,343
National Hispanic Scholars	127
National Achievement Scholars	3

[1] *Campus enrollments are based on class funding campus.*

University Office of Institutional Analysis
Last Update: February 12, 2015

APPENDIX E

CROSS TABULATIONS FOR CHALLENGE PROGRAM FORMAT

Variable	I.C. 2013	I.C. 2014	Cm.C. 2015	WCA Grant 2015	Open Pitch Tempe 2015	Open Pitch DPC 2015	Open Pitch West 2015	Open Pitch Poly 2015
Pell Eligible	21.6%	24.3%	33.2%	16.7%	43.3%	26.3%	63.2%	37.2%
Financial Aid Offered	97.3%	94.8%	94.2%	94.4%	93.2%	89.5%	89.0%	86.4.%
Resident	63.7%	66.5%	72.6%	63.2%	59.5%	45.0%	77.3%	77.6%
Non-Resident	36.3%	33.5%	27.4%	36.8%	40.5%	55.0%	22.7%	22.4%
Caucasian	46.8%	52.3%	49.3%	47.4%	43.2%	45.0%	50.0%	57.1%
Hispanic	6.5%	15.6%	19.4%	21.1%	16.2%	15.0%	27.3%	14.3%
African American	11.3%	7.3%	6.0%	13.2%	2.7%	10.0%	9.1%	0.0%
Asian	13.7%	8.7%	8.5%	2.6%	2.7%	10.0%	0.0%	8.2%
Other	21.8%	16.1%	16.9%	15.8%	35.1%	20.0%	13.6%	20.4%
Male	70.2%	66.1%	56.7%	47.4%	81.1%	75.0%	63.6%	93.9%
Female	29.8%	33.9%	43.3%	52.6%	18.9%	25.0%	36.4%	6.1%
Graduated	76.6%	67.8%	62.8%	45.0%	62.2%	40.0%	37.5%	42.0%
Retained	91.1%	95.9%	96.5%	94.7%	86.5%	85.0%	95.5%	87.8%
Undergrad	67.7%	74.8%	78.6%	78.9%	67.6%	70.0%	86.4%	85.7%
Graduate	32.3%	25.2%	21.4%	21.1%	32.4%	30.0%	13.6%	14.3%
Full-Time	88.7%	90.8%	91.0%	92.1%	83.8%	75.0%	77.3%	81.6%
Part-Time	11.3%	9.2%	9.0%	7.9%	16.2%	25.0%	22.7%	18.4%
Online	3.2%	1.8%	1.5%	0.0%	0.0%	5.0%	0.0%	0.0%
Group A	20.2%	31.7%	19.9%	34.2%	24.3%	35.0%	4.5%	8.2%

Variable	I.C. 2013	I.C. 2014	Cm.C. 2015	WCA Grant 2015	Open Pitch Tempe 2015	Open Pitch DPC 2015	Open Pitch West 2015	Open Pitch Poly 2015
Group B	3.2%	1.8%	5.0%	7.9%	8.1%	10.0%	4.5%	2.0%
Group C	4.0%	0.9%	1.0%	7.9%	0.0%	5.0%	59.1%	0.0%
Group D	19.4%	22.9%	35.8%	23.7%	16.2%	30.0%	22.7%	6.1%
Group E	41.9%	29.4%	23.4%	13.2%	40.5%	20.0%	9.1%	83.7%
Group F	11.3%	13.3%	14.9%	13.2%	10.8%	0.0%	0.0%	0.0%
GPA < 1	0.8%	0.5%	0.0%	0.0%	6.5%	0.0%	0.0%	0.0%
GPA [1, 1.5)	1.7%	0.0%	1.0%	0.0%	0.0%	0.0%	0.0%	4.3%
GPA [1.5, 2)	1.7%	1.4%	2.5%	2.6%	0.0%	0.0%	0.0%	4.3%
GPA [2, 2.5)	0.8%	4.3%	3.0%	2.6%	0.0%	16.7%	0.0%	4.3%
GPA [2.5, 3)	8.5%	9.0%	10.6%	5.3%	12.9%	5.6%	10.0%	10.9%
GPA [3, 3.5)	24.6%	22.7%	25.3%	23.7%	29.0%	33.3%	30.0%	34.8%
GPA [3.5, 4)	30.5%	33.2%	31.8%	44.7%	22.6%	22.2%	40.0%	23.9%
GPA >= 4	31.4%	28.9%	25.8%	21.1%	29.0%	22.2%	20.0%	17.4%

*Challenge sample population = 722. Null or missing values filtered for each cell

APPENDIX F

CROSS TABULATIONS FOR CLASS PROGRAM FORMAT

Variable	Launch Day Classes Tempe 2015	Launch Day Classes Downtown 2015	Launch Day Classes West 2015	Launch Day Classes Poly 2015
Pell Eligible	32.3%	42.6%	48.3%	45.1%
Financial Aid Offered	87.3%	91.2%	91.2%	88.2%
Resident	59.2%	71.7%	79.0%	70.5%
Non-Resident	40.8%	28.3%	21.0%	29.5%
Caucasian	50.7%	52.2%	52.4%	58.9%
Hispanic	18.0%	27.5%	28.1%	15.4%
African American	3.8%	5.7%	6.2%	4.3%
Asian	7.6%	4.1%	5.4%	6.3%
Other	19.8%	10.5%	7.8%	15.1%
Male	58.4%	42.8%	36.6%	79.7%
Female	41.6%	57.2%	63.4%	20.3%
Graduated	18.7%	35.1%	34.1%	29.3%
Retained	90.9%	90.8%	91.0%	90.9%
Undergraduate	99.7%	98.7%	99.8%	99.7%
Graduate	0.3%	1.3%	0.2%	0.3%
Full-Time	95.8%	95.3%	91.8%	92.2%
Part-Time	4.2%	4.7%	8.2%	7.8%
Online	0.0%	0.0%	0.0%	0.0%
Group A	32.1%	8.2%	6.4%	11.6%
Group B	8.5%	46.1%	1.0%	2.0%

Variable	Launch Day Classes Tempe 2015	Launch Day Classes Downtown 2015	Launch Day Classes West 2015	Launch Day Classes Poly 2015
Group C	1.4%	0.5%	71.2%	1.3%
Group D	36.1%	44.1%	16.3%	0.0%
Group E	18.6%	0.4%	1.4%	83.8%
Group F	3.3%	0.7%	3.6%	1.2%
GPA < 1	3.1%	3.3%	3.0%	2.8%
GPA [1, 1.5)	2.2%	1.6%	1.4%	1.5%
GPA [1.5, 2)	4.8%	3.4%	3.0%	3.7%
GPA [2, 2.5)	11.7%	8.2%	8.7%	8.8%
GPA [2.5, 3)	19.8%	16.8%	15.1%	15.0%
GPA [3, 3.5)	28.9%	27.1%	26.9%	28.2%
GPA [3.5, 4)	22.9%	27.6%	28.3%	27.4%
GPA >= 4	6.6%	12.0%	13.5%	12.6%

*Class sample population = 5,686. Null or missing values filtered for each cell

APPENDIX G

CROSS TABULATIONS FOR EVENT PROGRAM FORMAT

Variable	CGIU 2014	Launch Day 1:1 Tempe 2015	Startup Summit 2015	Launch Day 1:1 Downtown 2015	Launch Day 1:1 West 2015	Launch Day 1:1 Poly 2015	Edson 2015
Pell Eligible	29.4%	34.0%	25.2%	35.0%	56.2%	41.9%	15.4%
Financial Aid Offered	90.0%	87.6%	81.1%	95.7%	97.1%	85.7%	100.0%
Resident	63.2%	61.2%	46.7%	73.1%	79.4%	61.5%	80.5%
Non-Resident	36.8%	38.8%	53.3%	26.9%	20.6%	38.5%	19.5%
Caucasian	44.3%	52.5%	33.3%	54.6%	47.7%	49.0%	61.0%
Hispanic	17.8%	15.6%	16.3%	21.0%	31.8%	21.2%	17.1%
African American	4.6%	1.9%	4.4%	7.6%	8.4%	2.9%	0.0%
Asian	9.2%	9.9%	5.9%	6.7%	6.5%	4.3%	9.8%
Other	24.1%	20.2%	40.0%	10.1%	5.6%	22.6%	12.2%
Male	34.5%	60.5%	75.6%	30.3%	30.8%	69.2%	80.5%
Female	65.5%	39.5%	24.4%	69.7%	69.2%	30.8%	19.5%
Graduated	63.3%	44.1%	46.7%	30.0%	45.0%	35.6%	77.9%
Retained	96.0%	92.4%	94.8%	92.4%	97.2%	95.7%	97.6%
Undergraduate	77.0%	87.8%	72.6%	89.9%	98.1%	89.4%	56.1%
Graduate	23.0%	12.2%	27.4%	10.1%	1.9%	10.6%	43.9%
Full-Time	92.0%	93.5%	94.1%	92.4%	94.4%	96.2%	80.5%
Part-Time	8.0%	6.5%	5.9%	7.6%	5.6%	3.8%	19.5%
Online	1.7%	0.0%	3.0%	0.8%	0.0%	0.0%	0.0%
Group A	39.7%	26.6%	8.1%	32.8%	4.7%	12.5%	22.0%

Variable	CGIU 2014	Launch Day 1:1 Tempe 2015	Startup Summit 2015	Launch Day 1:1 Downtown 2015	Launch Day 1:1 West 2015	Launch Day 1:1 Poly 2015	Edson 2015
Group B	1.1%	3.0%	3.7%	43.7%	0.9%	0.5%	4.9%
Group C	3.4%	1.9%	9.6%	0.8%	59.8%	0.5%	0.0%
Group D	25.3%	22.8%	22.2%	17.6%	8.4%	2.9%	14.6%
Group E	19.0%	31.2%	52.6%	5.0%	0.9%	79.3%	53.7%
Group F	11.5%	14.4%	3.7%	0.0%	25.2%	4.3%	4.9%
GPA < 1	2.9%	3.2%	0.8%	0.0%	0.0%	0.0%	0.0%
GPA [1, 1.5)	0.6%	1.2%	0.8%	0.9%	0.0%	0.5%	2.9%
GPA [1.5, 2)	2.9%	1.2%	4.5%	1.7%	0.0%	2.4%	0.0%
GPA [2, 2.5)	4.7%	7.1%	3.8%	5.1%	7.5%	7.2%	0.0%
GPA [2.5, 3)	11.7%	16.2%	14.4%	13.7%	14.0%	12.1%	5.9%
GPA [3, 3.5)	19.9%	24.1%	23.5%	28.2%	17.8%	28.0%	35.3%
GPA [3.5, 4)	33.9%	32.4%	33.3%	24.8%	32.7%	29.5%	26.5%
GPA >= 4	23.4%	14.6%	18.9%	25.6%	28.0%	20.3%	29.4%

*Event sample population = 1,051. Null or missing values filtered for each cell

APPENDIX H

CROSS TABULATIONS FOR CAMP PROGRAM FORMAT

Variable	Startup Spring Break 2015	Variable	Startup Spring Break 2015
Pell Eligible	37.5%	Full-Time	74.1%
Financial Aid Offered	66.7%	Part-Time	25.9%
Resident	55.6%	Online	3.7%
Non-Resident	44.4%	Group A	7.4%
Caucasian	25.9%	Group B	14.8%
Hispanic	22.2%	Group C	7.4%
African American	0.0%	Group D	22.2%
Asian	18.5%	Group E	40.7%
Other	33.3%	Group F	7.4%
Male	66.7%	GPA < 1	4.0%
Female	33.3%	GPA [1, 1.5)	4.0%
Graduated	67.7%	GPA [1.5, 2)	0.0%
Retained	96.3%	GPA [2, 2.5)	0.0%
Undergraduate	59.3%	GPA [2.5, 3)	16.0%
Graduate	40.7%	GPA [3, 3.5)	16.0%
		GPA [3.5, 4)	28.0%
		GPA >= 4	32.0%

*Camp sample population = 27. Null or missing values filtered for each cell