

**Through the Stakeholders' Eyes: An Evaluation of a Transnational Biomedical
Research Training Program Advancing the Growing Practice of Global Health Education**

by

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Abstract

Background

Influenced by *Embrace the World*, Pitt's strategic plan for its global vision the University of Pittsburgh (Pitt) has enhanced its involvement in transnational knowledge sharing endeavors over several decades. The School of Medicine at the University of Pittsburgh has been directly involved in a global health education initiative involving transnational biomedical research training and scientific skills development. The program involves hosting young Chinese medical professionals or Visiting Chinese Medical Professionals (VCMP) from Tsinghua School of Life Sciences, Beijing, China who work alongside members of the "laboratory community."

Statement of Dissertation of Practice

This dissertation of practice is an evaluation of this transnational biomedical research training program. The program evaluation includes the assessment of stakeholder perspectives to identify program strengths, areas for development, opportunities, barriers, and goals. Identifying these areas helps develop an understanding of the responsiveness of the system to this transnational training program.

Methods

Personal interviews and focus groups combined with secondary data analysis of the Methods and Logic in Biomedicine curriculum, exit interview surveys designed and conducted by

personnel from the University of Pittsburgh School of Medicine (UPSOM), and contractual objectives were used to identify global health education practices in this transnational training program. A strengths, weaknesses, opportunities, and barriers (SWOB) analysis was conducted. Data was coded using NVivo software.

Results

Study participant groups' perspectives align and disconnect in program goals, strengths, weaknesses, opportunities, and barriers. Effort, generation of data, and personal development are identified as main themes in how each group defines productivity. The “laboratory community” is identified as a system supporting this transnational training program. Reported as an area for development is the espoused value of diversity and inclusion.

Conclusions

This transnational training program in biomedical research is a special niche within global health education. The system supporting this program at the University of Pittsburgh has shown adaptability to challenges. Outcomes of this global health education program are the development of scientific skills sets and the evolution of a young physician scientist.

Keywords

Knowledge Sharing, Global Health Education, Transnational, Program Evaluation, Social Innovation, Espoused Values, Systems Thinking

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1.0 Section 1. Introduction

Internationalism has enriched the possibilities of a multitude of knowledge sharing practices across many disciplines. One such discipline is global education, and, specifically related to this study, global health education. Over several decades, the University of Pittsburgh, an institution interested in increasing its global interactions, has enhanced its involvement in transnational knowledge sharing endeavors (Jacob, Sutin, Weidman, Yeager, 2015; Steinberg, 2013). Steinberg's introduction of the action terminology, *knowledge mobilization*, has been translated in this study to knowledge sharing (2013, p. 9). Knowledge sharing in this study is sharing both intellectual and cultural information (Steinberg, 2013). *Transnational* in this study is defined as, *across continents, or the convergence of two cultures*. Human mobility refers to the influx of international students, staff, and administration into higher education institutions with an emphasis on industrialized countries.

1.1 Problem Area

This exploration of transnational knowledge sharing and human mobility begins with the global concepts of internationalism and globalization as they relate to global health education and higher education institutions. Both globalization and internationalism have a driving vision of decreased international barriers (Altbach & Knight, 2007; Battat, Seidman, Chadi, Chanda, Nehme, Hulme, Li, Faridi, & Brewer, 2010; Brown & Lauder, 2012). Two schools of thought emerge in exploring globalization and internationalism. One views globalization as grounded in

western ideology of power and privilege that is driven by economics and has political and social undertones of economic gains (Essay UK, 2019). On the other hand, studies show that the ideology of internationalism emphasizes economic betterment founded in co-operation and takes into consideration human rights with long-term economic benefits for a more equitable playing field around the globe (Essay UK, 2019; Altbach & Knight, 2007; Jacob *et al.*, 2015; Weidman, 2006).

Altbach and Teichler (2001) highlight an element of internationalism in their article by saying, “In recent decades, the international mobility of staff and students has become a normal part of academic life, involving perhaps 3 to 5 million people annually” (p. 8). They further elucidate this claim by stating, “Although mobility is more likely for the most able students and staff, it has become a normal option for staff and students as well as a regular policy and administrative review within higher education institutions, especially in the industrialized countries” (p. 8). Altbach and Teichler (2001) emphasize the role that higher education institutions now play in human mobilization. They refer to the fact that national and regional agencies account for a small fraction of “cross-border mobility” compared to that of individual initiative, business enterprise, and academic institutions (Altbach & Teichler, 2001, p. 9). Undeniably, human mobility has enhanced both knowledge sharing capability and the concept of humans as a commodity.

Global health education can exist because of international mobility. Simpson, as cited by Tozer (2011), states, “the concept or ... conviction that globalization is a way of thinking and proceeding ... holds great promise for the world” (p. 339). Whether grounded in globalism or internationalization ideology, the way two nations interact with one another impacts the potential for social innovation. Although transnational endeavors are multi-faceted, both competitive drive and economic interest among higher education institutions have served as an impetus for many

transnational collaborative endeavors. In these progressive realms of transnational knowledge sharing endeavors, both economic benefit and social innovation exist. Intertwining the ideologies of internationalism and globalization, higher education institutions have brought numerous opportunities for social innovation and the advancement of knowledge sharing, especially in health education.

Social innovation is defined by Frances Westley in Patton (2011), “as an alteration of what is established by the introduction of new elements or forms (including new ideas, practices, or resource flows); in particular, the alteration of social relationships to allow for transformation of intransigent and broadly-based social problems” (p. 36). Social innovation can be situated on both ends of the internationalism/globalization spectrum. The past several decades have revealed a continually growing trend of Chinese graduate students enrolling in universities outside of China, which is largely a result of competitive drive and a growing institutional interest and involvement in globalization (Jacob *et al.*, 2015; Tan & Weidman, 2012; Weidman, 2006; Xu & Fang, 2013). Nestled within decades of literature discussing economic, social, and political processes and outcomes of internationalism and globalization are the concepts of knowledge sharing and global health education practices.

Olssen *et al.* (2004) describe a way that sheds light on what global health education in this context could mean. On global issues of concern, such as health, Olssen *et al.* (2004) states,

Globalization cannot be seen as a qualitatively new development, but rather as the intensification of a process that is age-old...forms of governance are changing from state to global, to inter-state, to non-governmental and to private market mechanisms...With ‘globalizers’ and ‘hyper globalizers’ it can be argued that states have a diminished capacity to protect their borders against private international decision-making (p. 255).

The concept of global health education should be reflected upon in terms of Battat, Seidman, Chadi, Chanda, Nehme, Hulme, Faridi, & Brewer's (2010) meaning, "Global health is the study and practice of improving health and health equity for all people worldwide through international and interdisciplinary collaboration" (p.1) Global health education, grounded in human rights, attempts to understand potential social and economic trajectories of global health from the ideology of internationalism.

Global health education practices such as transnational knowledge sharing face many challenges, including communication barriers, cultural differences, workplace adjustment demands, organizational nuances, and aptitude variances. Aptitude variances equate to ability and personal drive. Another identifiable challenge in global health education is setting the terms of transnational agreements for transnational knowledge sharing. This economic and social negotiation process can be complicated as clear communication is a serious challenge.

1.2 Inquiry Context and Setting

The Department of Surgery at the University of Pittsburgh School of Medicine operates as a host for Chinese citizens in a transnational biomedical training program, which in this context consists of American and Chinese coming together under the practice of medicine to share medical research knowledge. The collaboration began after a mentor/student experience between Dr. Jeremy Berg, now a distinguished faculty member at the University of Pittsburgh, and an aspiring molecular biophysics Ph.D. graduate student from China, Yigong Shi. (McDonald, Barson, Lorence, Staresinic, 2014; McDonald, Lorence, Staresinic, 2013). The valuable mentorship experience left such an impression on Dr. Shi that upon his graduation and return to China, he

wanted to share this positive experience with citizens of his country. That positive knowledge sharing experience stimulated a vision resulting in social innovation and movement in global health education practices through the inception of this transnational biomedical training program.

In the context of knowledge sharing and global health education practices, the transnational biomedical training program at the University of Pittsburgh, initiated in 2012, involves skills training between American citizens and Chinese citizens. This biomedical research training program endeavor at the graduate and postgraduate level with Mainland China directly impacts the University of Pittsburgh's objective to enhance its reputation in the global education market. This section describes the institutional setting in which this transnational training program exists. The section begins with the big picture description of the University of Pittsburgh, followed by a description of the School of Health Sciences at the University of Pittsburgh. The paper then reviews the School of Medicine and the Department of Surgery. Finally, this section describes the transnational program and my position within this program.

1.2.1 The University of Pittsburgh

The University of Pittsburgh, founded in 1787 as the Pittsburgh Academy, found its home in Oakland, Pennsylvania in 1908. The University was a private institution until 1966 when it joined the Commonwealth System of Higher Education. Based on measurements of quality of education, alumni employment, quality of faculty, influence, patents, scholarly citations, broad impact, and publications, the University of Pittsburgh rose from 47th to 43rd internationally in 2017 in the Center for World University Rankings. The University of Pittsburgh has a total economic impact of \$3.9 billion and generates \$186.8 million in state and local tax revenue (TrippUmbach, 2016). The National Science Foundation ranks the University of Pittsburgh 9th in the nation in federal

science and engineering funding with research activity generating \$1.4 billion in annual economic impact in 2015 with 7,727 jobs supported by this funding and \$46.8 million in local and state government revenue (TrippUmbach, 2016). In 2018, The National Institute of Health ranked the University of Pittsburgh 5th among U.S. institutions in competitive grants awarded to faculty members with 1,116 awards totaling \$546,388,511 (<https://report.nih.gov/award/index/cfm>). The University includes the following:

- 26,487 undergraduate students
- 9,541 graduate students
- 5,357 faculty members
- 7,289 staff members

1.2.1.1 Institutional Support Through Policy

The University of Pittsburgh’s global goals, as outlined in the 2016 Global Pitt Plan, *Embracing the World*, proposes “a strategic approach to international partnerships” (<https://www.ucis.pitt.edu/main/embrace-world>). A committee of international partners and the University of Pittsburgh community convened and found value in the “exchange of ideas and values” where responsibility is assumed to keep the exchange of information and knowledge flowing (<https://www.ucis.pitt.edu/main/embrace-world>). The plan specifically states: “We aspire to serve as a global convening point where individuals and communities can freely engage in collaborative dialogue and activities that positively impact the quality of life, health, prosperity, and social mobility of people here and around the world” (<https://www.ucis.pitt.edu/main/embrace-world>).

Open Doors Data (2015) ranked the University of Pittsburgh number seventeen (#17) in institutions across the nation hosting international J-1 Research Scholars. The University hosted 1,716 in 2014 and 2015, six hundred and thirteen (613) of whom are involved with the School of Medicine alone (Office of International Services Annual Report, 2015; Office of International Services Fact Book, 2015; J-1 Visa Exchange Visitor Program, 2016; Institute of International Education, 2016). The influx of transnational scholars to institutions in the state of Pennsylvania is extensive. The institution is invested in such endeavors, so why not exert the effort to develop program coherence, human and social capital, and allocation of resources?

1.2.1.2 Schools of Health Sciences

The University of Pittsburgh Schools of Health Sciences is comprised of six Schools in Health Sciences (<http://www.health.pitt.edu/>), each designed to enhance translational research. The Office of Research School of Health Science's mission is "to foster both the emerging and the established research enterprises within and across the six schools of Health Sciences at the University of Pittsburgh" (<https://www.oorhs.pitt.edu> , 2019). The six schools include:

1. Graduate School of Public Health (<http://www.publichealth.pitt.edu/>),
2. School of Dental Medicine (<http://www.dental.pitt.edu/>),
3. School of Health and Rehabilitation Sciences (<http://www.shrs.pitt.edu/>),
4. School of Medicine (<http://www.medschool.pitt.edu/>),
5. School of Nursing (<http://www.nursing.pitt.edu/>),
6. School of Pharmacy (<http://www.pharmacy.pitt.edu/>)

1.2.1.3 School of Medicine / Department of Surgery

The University of Pittsburgh/UPMC Department of Surgery trains future leaders in academic surgery through core residency programs and fellowship programs. The Department is comprised of the following divisions:

- Abdominal Transplantation
- Breast Surgical Oncology
- Colon & Rectal Surgery
- Hepato-Pancreato-Biliary Surgery
- Minimally Invasive and Metabolic Surgery
- Pediatric Surgery
- Vascular Surgery

Each of these divisions is comprised of expert faculty members who engage in clinical and laboratory research as independent researchers. The Department is recognized globally for its research programs, resident research/training, and fellowship/training (www.surgery.pitt.edu). Led by Dr. Timothy Billiar, the George Vance Foster Professor and Chairman, the Department of Surgery includes:

- 7 Vice Chairs
- 13 Division Chiefs
- 172 Faculty Members

Appendix J exhibits J1 & J2 depict the multiple levels of institutional involvement at the University of Pittsburgh. These multiple levels of involvement, in conjunction with the transnational element, meld to create a complex and dynamic organizational culture. The multiple hierarchical levels of stakeholders both inform and constrain the transnational training program.

On the one hand, this stratification can cloud intentions and knowledge sharing through a disconnect in communication channels (Steinberg, 2013). On the other hand, having such a diverse community of resources can provide avenues for policy development and informed insight, which are imperative for the development of institutional goals related to global health education practices.

1.2.1.4 The Training Program

The Visiting Chinese Medical Professionals (VCMP) are either third-year medical students or postgraduates from two Universities in China, Tsinghua University School of Life Sciences in Beijing, China and Central South University Xiangya School of Medicine in Changsha, China. I refer to both groups of Chinese medical students and Chinese medical professionals as Visiting Chinese Medical Professionals (VCMP). Tsinghua University School of Life Sciences has signed a renewal agreement for another five years of transnational biomedical research training with the University of Pittsburgh School of Medicine (Factbook, 2016/2017). Xiangya School of Medicine has initiated this same type of transnational collaboration with multiple institutions in the United States.

The Visiting Chinese Medical Professionals (VCMP) undergo a rigorous selection process: some are invited to the University of Pittsburgh School of Medicine to develop the skillset and knowledge base necessary to be a physician scientists acquiring basic science research techniques and medical research skillsets alongside Resident Personnel (RP), *i.e.*, existing employees and affiliates of the University of Pittsburgh School of Medicine. This type of transnational training program involves one-on-one instruction, mentorship, and shared workspaces.

The constraint of time and continuous turnover of Visiting Scholar Medical Professionals (VCMPs) make it difficult to build relationships, which influences team dynamics, laboratory

culture, and the ability to create a sense of *belonging*, which will be discussed later in the literature review (Carolissen, 2012). It takes time to form a trusting relationship. If present experiences are jaded by an inability to form cohesive teams or misunderstandings about expectations, or assumptions and cultural biases, future development of global health research could be dramatically impeded. These challenges influence knowledge sharing. Identifying strengths in the program and areas for development will help develop an understanding of the responsiveness of the system to this transnational training program.

My position within the training program and this evaluation could be perceived as both a benefit and a drawback. I work as a Laboratory Manager and Educator within the Department. My specialty is animal model development and surgical skills education used to test immune function. The fact that I am embedded in the trenches of the program at a level far below the positions where major policy decision-making occurs both contributes to and impedes certain aspects of conducting the study. Awareness of power differentials and my positioning in this system, in conjunction with honest communication throughout the process, contributes to the validity of the study. The position I hold in this training program gives me a comfortable place from which to conduct an evaluation.

1.3 Stakeholders

This transnational training program can be categorized as a complex system based on Mitchell, as cited by Patton (2011), states, “A complex system is characterized by a large number of interacting and interdependent elements in which there is no central control; self-organizing and emergent behaviors based on sophisticated information processing generate learning, evolution,

and development” (p.1). This transnational training endeavor has been initiated through a top-down organizational landscape. The challenges of transnational endeavors, such as: cultural differences, workplace adjustment demands, communication barriers, organizational nuances, and aptitude variances in conjunction with organizational dynamics inherent to higher education institutions, equate to no central control and a lot of independently moving parts. The idea of complex systems is discussed in the review of supporting literature section.

Figure 1 is a visual representation of the stakeholder group classifications. Using tactics of the stakeholder approach to evaluations, as described by Gamble (2008) and Patton *et al.* (2016), I have classified the stakeholders in this dissertation of practice as follows:

- The Visionaries are those stakeholders who originated this idea, and they have a personal vested interest in its success. These stakeholders include: Deans and Associate Deans, Chancellors and Vice Chancellors, and Department Chairmen.
- The Policy-Makers are those stakeholders who desire to ensure the institution, i.e., the University of Pittsburgh, is represented in the best light and follows federal and state regulations. These stakeholders include: Executive Administration and Directors
- The Street-Level Managers are those stakeholders who are expected to implement the rules and regulations that the policy-makers put in place. They are also directly responsible for the day-to-day compliance of the VCMP. These stakeholders include: Department and Laboratory Administration and Managers and Mentoring Faculty
- The Day-to-Day Operations Specialists are responsible for experimental procedures training and knowledge sharing related to conducting experiments, as well as daily interactions of this professional development training experience. These stakeholders include Staff/Technicians, Visiting Chinese Medical Professionals, and Residents.

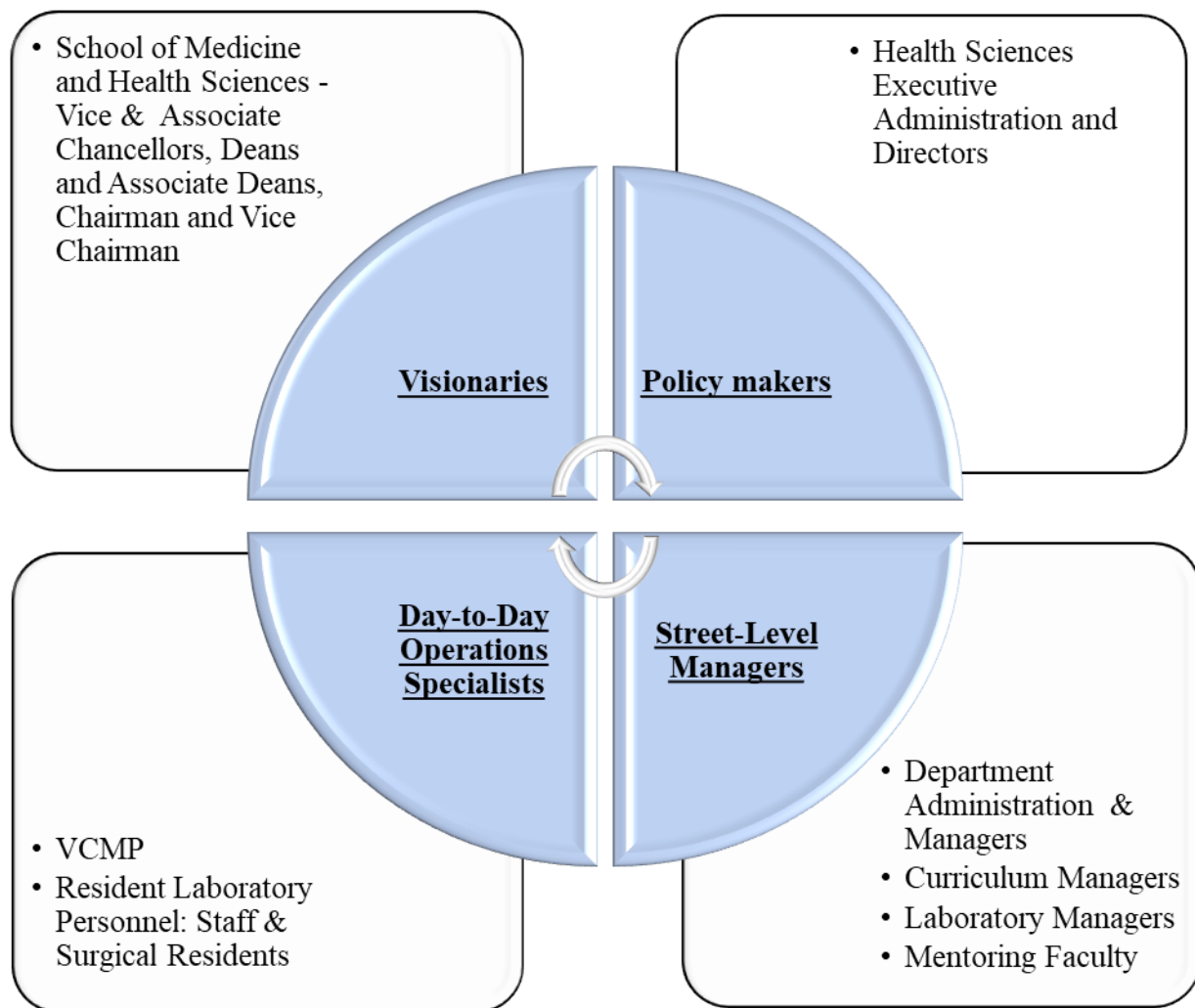


Figure 1 Visual Representation of Stakeholder Classification Groups

1.4 Statement of Dissertation of Practice

The dissertation of practice looks at the system supporting this transnational training program to clearly define the strengths and areas for development. This transnational training program contains obstacles that restrict the full potential for knowledge sharing and system development. The path from the arrival of the Chinese medical professionals to their departure involves dynamic relationships constrained by the complexities of the following: personal cultural

differences, workplace adjustment demands, communication barriers, innovative research practices, organizational nuances, such as organizational/professional culture, and aptitude variances, i.e., ability and personal drive. Identifying stakeholder perspectives on relationships and interrelationships and perceived strengths and areas for development in the program produces a picture of the system supporting this transnational training program and provides the ability to replicate the program in other departments and the ability to advance this global health education practice.

1.5 Inquiry Questions

The specific themes of interest in this dissertation of practice are used to elucidate the present operating system for the transnational biomedical training program between the University of Pittsburgh School of Medicine and Tsinghua University School of Life Sciences in Beijing China. This study will inform stakeholders of several outcomes:

1. What practices are in place to advance knowledge sharing and global health education practices in this transnational training program?
 - a. What are the goals?
 - b. What are program strengths, weaknesses, opportunities, and barriers?
 - c. What knowledge sharing practices have evolved?
2. What gaps exist between organizational practice and espoused values?
 - a. What are the emergent needs of the stakeholders?
 - b. What are the stakeholders' espoused values?
 - c. How do stakeholders' values align?

3. What does the system look like to support transnational biomedical research training at the University of Pittsburgh?

2.0 Section 2. Review of Supporting Literature

Though more research in such a specialized niche of global health education practice is desirable, this section highlights concepts from existing scholarly literature that support this evaluation of a transnational biomedical research training program. Very little research exists in such a specialized niche in global health education practices. This review of scholarly literature introduces areas that contribute to the discussion of fostering, sharing, and informing global health education practices at higher education institutions, including framing global health and concepts associated with knowledge sharing, culture, and program evaluation as a practice.

2.1 Global Health Education

2.1.1 Definition and Development

Koplan, Bond, Merson, Reddy, Rodriguez, Sewankambo, and Wasserheit, authors of *Towards a Common Definition of Global Health*, recognize the interest in global health as they discuss the philanthropic ventures, government policies, and academic programs that proliferated because of the global health ideal. Koplan et. al. recognize that global health is framed as a notion, an objective, and a mixture of scholarship and research and also acknowledge that, “without an established definition of global health, a shorthand term such as global health might obscure important differences in philosophy, strategies, and priorities for action between physicians, researchers, funders, the media, and the general public” (2009, p. 1993). Koplan et al. state:

Perhaps most importantly, if we do not clearly define what we mean by global health, we cannot possibly reach agreement about what we are trying to achieve, the approaches we must take, the skills that are needed, and the ways that we should use resources (p. 1993).

Koplan et al. describe global health as possessing both attributes of public health and international health. Similarly, Williams and Des Marais suggest global health involves the development and implementation of solutions requiring the global cooperation cultivated by globalization and internationalization. The establishment of The International Sanitary Conference, in 1851, marking the first formal attempt to organize an international approach to address the global spread of disease (Williams & Des Marais, 2016). Williams and Des Marais (2016) provide a timeline for the establishment of what is now the World Health Organization (WHO), which developed post-WWII from the combination of the Office Internationale d'Hygiene Publique, the League of Nations Health Organization, and the United Nations Relief and Rehabilitation Administration (2016, p. 4). The establishment of the WHO is relevant because the evolution of the WHO from the 1960s to the 1990s demonstrated a global health approach through a “multidimensional perspective on health and development that encouraged community participation and health education” (Williams & Des Marais, 2016, p. 4). Nearly a century later, and largely “as a result of decolonization in Africa, Asia, and Latin America . . . the growth of study opportunities began to proliferate in the 1950s,” increasing “resources to support global education and practice experiences for students” (Williams & Des Marais 2016, p. 5). They continued by stating that this growth “evolved into today’s network of organizations that support international education and research opportunities” (Williams & Des Marais, 2016, p. 5).

Koplan et al. approach a formal definition of global health by first exploring what the term *global* means (Koplan et al., 2016, p. 1994). Koplan et al. propose the following to address this

question, “The global in global health refers to the scope of the problems, not their location” (p. 1994). This description allows for global health to include both domestic and transnational issues.

Koplan et al. (2016) distinguish global health in the following way:

The preference for use of the term global health where international health might previously have been used runs parallel to a shift in philosophy and attitude that emphasizes the mutuality of real partnerships, a pooling of experience and knowledge, and a two-way flow between developed and developing countries. Global health thus uses the resources, knowledge, and experience of diverse societies to address health challenges throughout the world (p. 1994-1995).

The progressive realms of medicine and medical science are conducive for pooling experience and promoting global health through global health education endeavors. Furthermore, Koplan et al. (2009) acknowledge that global health encompasses both clinical medicine, as well as the study of basic sciences. Koplan et al. (2009) offer the following definition for global health:

Global health is an area for study, research, and practice that places a priority on improving health and achieving equity in health for all people worldwide. Global health emphasizes transnational health issues, determinants, and solutions; involves many disciplines within and beyond the health sciences (sic) and promotes interdisciplinary collaboration; (sic) and is a synthesis of population-based prevention with individual-level clinical care (p. 1995).

Deepening this distinction is the trend in health care supporting knowledge sharing as represented by the formation of transnational academic programs, fellowship training, and institutions, such as the Institute for International Medicine (INMED), that focus efforts toward training students and professionals for cross-cultural health care and scientific investigation. Forming a global health education knowledge sharing community is an iterative process, which brings us to the next section.

2.1.2 Knowledge Sharing in Global Health Education

The immersion of different cultures in higher education institutions and health education corporations is enhancing cultural knowledge sharing, as well as technical knowledge sharing through skill development. Both cultural and technical knowledge sharing practices are leading to powerful social innovation in global health care. Schugurensky, among many researchers, believes the restructuring of the higher education institutions over the past few decades “cannot be isolated from ... globalization dynamics ... and the commodification of knowledge” (2013, p. 294).

Altbach and Knight (2007) associate the emergence of the “knowledge society” with the dramatic expansion of international activities of universities (p. 290). Mertens (2015), Hicks and Generett (2011), Choules (2007), and Paulston (2003) all agree that knowledge sharing, also known as *knowledge mobilization*, is embedded in critical theory and finds significance in social justice. However, the argument against sharing knowledge openly exists in the literature. This argument claims *knowledge mobilization* devalues human capital through enhancing opportunities to acquire specialized knowledge and skills without appropriate compensation for the knowledge sharer oversaturating the market, which puts a strain on job attainment within the global job market (Brown & Lauder, 2012, p. 121; Lin, 2008; Lauder, Brown, Dillabough, & Hasley, 2006). While it is necessary to conceptualize this perspective, other studies and literature, grounded in humanism and social justice, reveal knowledge sharing and knowledge creation as ways to enhance innovation, creativity, identity formation, and diversity (Krabel, Siegel, & Slavtchev, 2012; Diaz & Zirkel, 2012).

Some literature suggests that we are in the midst of the ‘age of human capital’ where knowledge sharing and human interactions are the valued commodity (Brown & Lauder, 2012, p. 117; Moore, 2004). Demonstrating similar consensus, Collin and Apple (2011) state:

citizens can and should ... work together through disparate channels to help each other shape and adapt to the new realities of the emerging socio-economic order. A crucial step in this process ... is the widening of opportunity within and across educational institutions for diverse learners to collaborate in developing powerful literacies necessary both for securing productive, rewarding labor in fast-moving informational economies and for reshaping socio-economic orders (p. 298).

Torres and Puiggrós discuss the production, distribution, and use of knowledge (1995).

Torres and Puiggrós are referring to knowledge sharing in traditional pedagogical practices of public education in Latin American schools and raise awareness to the question to how this traditional practice crosses cultures? Saltmarsh, Hartley, and Clayton (2009) argue that the outcome of reciprocity and the multi-directional flow of knowledge is community change and co-creation of knowledge. Other bodies of literature suggest otherwise, indicating that in the quest for economic prosperity, elite populations devalue human capital (Brown & Lauder, 2012; Felstead, 2002, as cited by Brown & Lauder, 2012; Leigh, 2011; Weber, 2014).

The reality is that these two schools of thought coexist. Both schools of thought agree that focus on market relationships can impede the development of human relationships and human value. For example, Weber (2014) stated: “One downside of globalization is the changed society focused on market values, not human values” (p. 67). This thought coincides with Garver-Berger and Johnston’s (2015) statement: “Research shows that it’s very hard to recover when a social relationship turns into a market relationship” (p. 136).

2.1.3 Constraining-Factor Model and Knowledge Sharing

Siemens, Roth, and Balasubramanian (2008) discuss the difficulties associated with knowledge sharing and devised the “constraining-factor model” to enhance understanding of the dynamic relationship among motivation, opportunity, and ability as they relate to knowledge

mobilization (p. 428). The constraining-factor model denotes that the dynamic coordination of motivation, opportunity, and ability directly impact knowledge sharing (Siemsen *et al.*, 2008). Hindrance of any one of the three: motivation, opportunity, or ability, results in limited knowledge mobilization. Although this statement may seem commonsensical, actually conceptualizing this constraining-factor model in the context of global health and global health education practices emphasizes the necessity of acknowledging the role of the organization in addressing the question of how knowledge sharing occurs in transnational education endeavors.

2.2 Global Health Summary

This section on global health presented several facets of global health and global health education. First, global health encompasses multiple levels, including community, national, and international engagements. Second, interest in globalization has enabled higher education institutions and corporations to be hubs for transnational knowledge sharing and skills development (Tan & Weidman, 2012; Weidman, 2006). Third, knowledge sharing is considered in the literature to both cultivate human value and devalue humans depending upon the drive for market relationships. Fourth, transnational training endeavors in clinical medicine and basic sciences promote global health education. These facets highlight global health practices as dynamic and complex systems involving the integration of different cultures and an amalgamation of human values and economic ventures. Higher education institutions and health-based organizations are places that support global health education practices through global cooperation, which can cultivate knowledge mobilization and promote health education.

2.3 The Organization

2.3.1 Systems Thinking

In 1936, the biologist Karl Ludwig von Bertalanffy engineered general systems theory to challenge reductionist schools of thought. Merriam-Webster defines reductionism as the theory that complex phenomenon can be explained by reducing mechanisms of operation into its simplest parts. General systems theory, on the other hand, postulates an interdisciplinary conceptual framework that focuses on wholeness, patterns, relationship, order, integration, and organization in closed and open systems (Bertalanffy, 1972). Bertalanffy's claim is that systems as a whole have physical properties and laws of physics that cannot be reduced to the laws of their simplest components to extrapolate meaning.

Systems thinking, a spawn of general systems theory, is associated with organizations, organizational dynamics, and social psychology literature. Systems thinking asks for a better understanding of the dynamics involved in human decision-making, including the acknowledgment of how decisions impact whole systems, not just pieces of a system (Senge, 2006). Systems thinking within an organization involves discussions of adaptability and capacity building, feedback loops, and human interaction within and between departments (Senge, 2006; Garvey-Berger & Johnston, 2015). Systems thinking encourages inquiry about how the system impacts decision-making, as well as how decision-making impacts the system, specifically, the organization.

2.3.1.1 Development of the Cynefin Framework

In 1999, Daniel Snowden entered the systems thinking conversation with his Cynefin framework. The Cynefin framework is a conceptual framework introduced by Snowden to aid in organizational decision-making. Snowden's Cynefin framework represents that spectrum of complexity just discussed. Garvey-Berger and Johnston suggest ways to help judge where something falls on the spectrum of complexity through assessing, "how much disagreement there is about project goals and ways to achieve them," and "whether the knowledge and capacities needed to work on the issue are located in one organization at one place or whether they are spread across different places, organizations, or sectors" (2015, p. 40). Snowden's Cynefin framework, as referenced by Garvey-Berger and Johnston (2015), includes these four system domains:

- Simple/Obvious System. Simply systems include a tightly constrained system with no degree of freedom.
- Complicated System. A complicated system is tightly coupled with governing constraints.
- Complex System. A complex system is a loosely coupled system with enabling constraints.
- Chaotic System. A chaotic system lacks any logical order and is free of constraints.

Combining the thinking of Snowden and Garvey-Berger and Johnston's explanations, this paragraph identifies each type of system in Snowden's Cynefin framework. Garvey-Berger and Johnston (2015) describe a simple system domain as possessing agreement between goals and processes with locally held knowledge, skills, and capacities. Garvey-Berger and Johnston (2015) describe a complicated system domain as an environment that has predictable cause and effect relationships. The authors further describe a complicated system domain as embracing effective

change management actions based on past experiences, consistent communication channels, and existing expertise and resources to help manage goals. Garvey-Berger and Johnston (2015) describe a complex system domain as an unpredictable system having variability in cause and effect relationships and broad boundaries for trying things out to determine what works and what does not. The complex system domain does not depend upon reproducibility of what works and what does not work. In complex systems, change is unpredictable, and communication channels are iterative learning processes that are refined on a continuum. Garvey-Berger and Johnston (2015) describe Cynefin's chaotic system domain as unpredictable. Existence in the chaotic system domain is not permanent. The chaotic domain operates under no cause-effect relationships and can perplex the rational mindset. The chaotic system domain is unstable and requires immediate decisions to align the chaotic system domain with another, more predictable system domain. Finally, the last domain Garvey-Berger and Johnston (2015) discuss is disorder. Disorder exists when no thoughtful decision about actions is necessary, and decisions are made from personal preference. Snowden's Cynefin framework, as described by Garvey-Berger and Johnston, helps to identify a system by complexity level to assist with approaches for decision-making while applying systems thinking.

2.3.1.2 Senge's Learning Organization

Senge (2006) encourages the acknowledgment of a system as being a dynamic complex of internal and external forces interacting and influencing every facet of organizational performance. Within an organization, there are cultural, organizational, and personal boundaries, all of which are crossed and redefined based on situations, decision-making, and relationship building. Systems thinking encourages the consideration of how all relationships impact one another, which requires understanding ingrained mental models and communication patterns with internal and external

stakeholders. Mental models, described by Senge as “deeply held internal images of how the world works, images that limit us to familiar ways of thinking and acting,” can confine a system (2006, p. 163). Being able to identify and challenge mental models within an organization can lead to what Senge refers to as a learning organization (2006). Senge (2006) recognizes that organizational systems exist in fragmented states that are managed by management teams who operate with a structured mindset, i.e., mental model (Senge, 2006).

Even though organizations can be filled with human capital possessing expert level skills and knowledge, this information is not always passed along or received as a result of these mental models. This disconnect in knowledge sharing creates partitions in social capital and stifles institutional capacity. Bill O’Brien, a CEO credited with encouraging a learning organization framework that helped the company, Hanover, survive when others crumbled, stated, “The healthy corporations will be ones which can systematize ways to bring people together to develop the best possible mental models for facing any situation at hand” (Senge, 2006, p. 171).

2.3.1.3 Garvey-Berger and Johnston’s Identifying the System

In *Simple Habits for Complex Times Powerful Practices for Leaders*, authors Garvey-Berger and Johnston (2015) attempt to supply the reader with ways to cope with the rise in “complexity, ambiguity, volatility, and uncertainty,” found in the world and workplaces (p. 1). The authors discuss *habits of the mind* (Garvey-Berger and Johnston, 2015). Habits of mind are ways of thinking and problem solving based on personal experience and learned tactics (Garvey-Berger & Johnston, 2015). The authors suggest the ways to expand thinking and enable leaders to deal with the complex world in which they find themselves is to adopt new habits of the mind that require an individual to ask different questions, take multiple perspectives, and see the system (p. 13). The authors urge readers to recognize the existence of a spectrum of complexity to guide

decision-making (Garvey-Berger and Johnston, 2015). Garvey-Berger and Johnston's emphasis on the importance of recognizing habits of the mind sound strikingly similar to the emphasis Senge places on recognizing mental models in systems thinking.

2.4 Consideration of Culture – National and Organizational

2.4.1 The Polarizing Effects of Culture

Culture, in the broadest sense, encompasses nationality. Unfortunately, culture in a narrower sense can have a polarizing effect through stereotyping. This section highlights the polarizing effect of how stereotyping perpetuates power imbalances imposed by racial and ethnic biases. During the past century and a half, numerous researchers have defined the word *culture* in diverse terms as indicated by these few examples extrapolated from Fan (2000):

- Tyler (1881) – that complex whole which includes knowledge, belief, art, morals, law custom, and any other capabilities and habits acquired by man as a member of society.
- Hoebel (1960) – the integrated sum total of learned behavior traits that are shared by members of a society
- Downs (1971) - a mental map which guides us in our relationships to our surrounds and to other people.
- Hofstede (1980) – the interactive aggregate of common characteristics that influence a group's response to its environment.

- Hofstede (1984) – collective programming of the mind which distinguishes one group of people from another.

In Fan's article, such phrases as "learned behavior traits," "mental maps," and "collective programming of the mind" refer to deeply held beliefs that guide behaviors and influence perspectives. These phrases bring to mind polarization and, more directly, the concept of stereotyping.

Stereotyping impacts group performance and the ability to share knowledge (Brown & Lauder, 2012; Krabel & Slavtchev, 2012; Shimpi & Zirkel, 2012; Lew, 2011). Brown and Lauder (2012), as well as Krabel and Slavtchev (2012), acknowledge the fears that perpetuate stereotypes through their indication that guest workers, i.e., foreign-born personnel, typically are more entrepreneurial and "do the same jobs for fewer rewards and inferior contracts of employment" (p. 125). As described here, guest workers may appear to be low skilled workers; however, Brown and Lauder and Krabel are not just referring to low skilled workers. According to Brown and Lauder and Krabel Slavtchev, these stereotypes are perpetuated in foreign-born personnel, especially those of Asian descent, regardless of skill level.

Lew (2011), Shimpi and Zirkel (2012), and Fan (2000) discuss the psychological implications associated with immigrant-host relationships. These authors highlight how mental models can impact cultural integration. Shimpi & Zirkel (2012) and Lew (2011) discuss ethnic stereotyping and the categorization of Asian students and professionals. Shimpi and Zirkel (2012) examined literature covering a 150-year period of history. The authors discovered repeating themes that acknowledge the way social power or race-based power imbalances of European Americans over other races, specifically Chinese Americans, preserve mental models that enable a notion where "Chinese and other Asian Americans are often conceived as perpetual foreigners"

(p. 535). According to Shimpi and Zirkel (2012), immigrant populations, regardless of the length of time these populations have spent in the host country, are referred to through descriptive terms that engender a sense of othering.

In their report, Shimpi and Zirkel's conceptual framework unveiled that, "what is often framed as a conversation about immigrants is actually a conversation about something else: namely race" (2012, p. 539). They found three main themes that remained constant regarding descriptions of Chinese Americans that they described as objectively suspicious. Chinese Americans are described as the "model minority," as "hard-working" and "diligent," however, these descriptive terms were paired with robot-like qualities, such as "drone" justifying cheap labor or inequitable wages and suggesting that "Chinese Americans are lacking in humanity" (Shimpi & Zirkel, 2012, p. 540). The second theme to emerge describes Chinese Americans as "isolationist and self-segregating," suggesting the Chinese Americans do not want to participate, justifying their exclusion from social activities by European Americans (Shimpi & Zirkel, 2012, p. 540). The third theme to emerge describes Chinese Americans as "lacking loyalty," suggesting they cannot be trusted and, therefore, should not be placed into positions where they are to be relied upon or valued (Shimpi & Zirkel, 2012, p. 540). Olssen, Codd, and O'Neil (2004) suggest that even if we want our realities and worlds to be divided, we are interconnected on a much deeper level, obstructing us from true segregation even with the indoctrination of stereotypes.

2.4.2 Intergroup Relations Perspective

Shimpi and Zirkel (2012) and Lew (2011) urge the reader to recognize such descriptive terms and consider the origin of these terms and the existing biases and assumptions perpetuated by the use of such terms as a beginning for change of the race-based power imbalances. Shimpi

and Zirkel (2012) suggest reframing transnational interactions by using an interracial interactions frame as a way of thinking and interacting. These authors do not use the terminology *transnational interaction*. I adopted this descriptive terminology from the research associated with global health education for this study. The authors believe an interracial interactions frame for viewing transnational interactions is better suited to change ingrained thoughts, i.e., mental models, than the immigrant-host frame that is still prevalent in this modern globalized world. The immigrant-host frame means there is a host, i.e., a country, an organization, a home, etc., and there are immigrants who come to the host. The immigrant-host title suggests a power imbalance. Shimpi and Zirkel (2012) suggest that simply using the terminology immigrant-host signifies polarization and imbalance. Shimpi and Zirkel (2012) draw from intergroup relations literature to suggest an intergroup relations perspective that highlights language and behaviors that perpetuate race-based power imbalances. The intergroup relations perspective encourages the process of understanding: “(1) the motivated function of stereotyping and prejudice, (2) the role that group separation can play in increasing, rather than decreasing, stereotyping and prejudice over time, and (3) racial differences are linked to the persistence of this othering of immigrant populations” (p. 550).

2.4.3 Organizational Culture

Awareness of the concept that organizations could possess a culture was raised as far back as the 1950s through the published case study of Elliott Jaques, M.D., titled *The Changing Culture of a Factory*. Raising awareness of what organizational culture might mean, the Oxford Index highlights the work of Glynn, Giorgi, and Lockwood’s (2013) *Organization Culture*. The work of these authors opened organizational culture discussions from management studies to organization studies.

Andrew Pettigrew reintroduced the concept of organizational culture in the 1970s with his work, *On Studying Organization Culture*, published in 1979 (Glynn, et al., 2013). It was Andrew Pettigrew's insights that led to the description of organizational culture as "an amalgam of beliefs, identity, ritual, and myth" (Glynn et al., 2013). Based on the work of Harrison and Handy in the 1970s, researchers have categorized organizational culture into "typologies of corporate character and culture" (Schein, 2010, p. 166).

Gerard 'Geert' Hofstede, Terrence Deal and Allan Kennedy, and Edgar Schein's research contributions began in the 1980s. Hofstede's book, *Culture's Consequences*, originally published in the 1980s and rewritten in 2001, introduces the dimension of comparative, cross-cultural studies to organizational culture (Hofstede, 2001). Hofstede's work on the influence of cultural differences in organizational cultural characteristics continues to be influential today (Glynn et al., 2013). Deal and Kennedy's 1982 work, *Corporate Cultures: The Rites and Rituals of Corporate Life*, pioneered one of the first models of organizational culture. All of these authors have contributed to understanding the role of organizational culture in business success and sustainability for decades. Finally, a brief discussion of Schein's is presented. Edgar Schein is an influential scholar who is still an active contributor to research in the field today. Schein first wrote about organizational culture in 1985. Many current authors base their work on the research and findings of Edgar Schein. For the remainder of this section, I am referencing the work of Schein to present the major concepts on organizational culture since many later authors base their work on his.

2.4.3.1 Organizational Culture, According to Schein

Schein (2010) opens the 4th edition of his book, *Organizational Culture and Leadership* by asking the reader to understand culture as a concept. Schein (2010) states, "Perhaps the most intriguing aspect of culture as a concept is that it points us to phenomena that are below the surface,

that are powerful in their impact but invisible and to a certain degree unconscious (p. 14). Schein (2010) shares two of his insights about culture and leadership. One insight emphasizes how culture can be created by our interactions with others. This insight allows the reader to perceive culture as fluid and dynamic. The other insight Schein shares is the perspective of culture as the stable and rigid way we often think of culture. From this perspective, culture taught through socialization experiences, means to “perceive, feel, and act in a given society, organization, or occupation . . . as a way to maintain the ‘social order’” (p. 3). This anthropologic perspective provides a concrete understanding of culture and provides a reason for why we behave in certain ways, and provides ways to extract meaning from daily life. Schein (2010) believes,

If we understand the dynamics of culture, we will be less likely to be puzzled, irritated, and anxious when we encounter the unfamiliar and seemingly irrational behavior of people in organizations . . . Even more important, if we understand culture better, we will understand ourselves better and recognize some of the forces acting within us that define who we are (p.9).

The focus of Schein’s 4th edition (2010) is understanding and defining culture as a concept. Schein’s 5th edition (2017) brings into the conversation modern ideologies that have evolved as a result of the explosion of technology. Schein (2017) discusses the importance of recognizing the integration of technology into the modern organization. The integration of technology has allowed organizations to span across continents, essentially demolishing borders. Schein advocates for looking at group culture and organizations holistically. Schein introduced the concept of a socio-technical system to highlight the interconnectedness of internal and external influences on groups and organizations. Schein identified “external problems of survival” as how groups and organizations align to handle the external environments in which they exist (2017, p. 149). Schein also identified internal issues, which are “the inevitable human problems that arise in collective life,” with which groups and organizations are faced (2017, p. 149). Both external and internal

influences are viewed as fundamental problems that shape groups of all types (Schein, 2017). Schein (2010, 2017) recognizes that culture as an abstract concept must be grounded to observable events. Schein encourages using cultural content models for understanding organizational culture and encourages the recognition of the social-emotional aspect of decision-making, i.e., feelings and emotions that are part of every decision and every human. Tending “to both the economic health of the organization and the internal organizational health,” i.e., human capital is important for functionality and sustainability according to studies referenced in Schein (2017, p. 8).

Schein describes 12 definitional categories that capture the depth and breadth of the concept of culture and states, “Culture . . . exists at many levels of observability. The categories are arranged roughly according to the degree to which you, as an observer, will be able to see and feel those cultural elements when you observe an organization or group” (2017, p.3). The 12 definitional categories for observability are as follows:

- Observing behavioral regularities when people interact,
- Defining group norms or implicit standards and values,
- Understanding espoused values, which are principles and values a group claims to be achieving,
- Holding a formal philosophy or ideologic principle that guides actions,
- Defining rules of the game,
- Possessing a climate or a feeling conveyed by an inner group and outside the group interactions,
- Possessing embedded skills
- Having habits of thinking, mental models, and linguistic paradigms
- Having shared meaning

- Having root metaphors that characterize the group
- Having formal rituals and celebrations
- Having identity and images of self as an organization (added to the 5th edition list)

Schein (2010, 2017) encourages the reader to consider the following as elements of culture:

- Structural stability, defined by a group's identity,
- Depth, defined by the deepest unconscious part of a group,
- Breadth, defined as pervasive and influential of all aspects of operations,
- Patterning, defined as rituals, values, and behaviors that make the whole from its interlaced working components.

Schein (2010, 2017) describes the importance of understanding organizational culture when he writes, “the forces that are created in social and organizational situations deriving from culture are powerful ... Cultural forces are powerful because they operate outside of our awareness (p. 7). Therefore, Schein (2017) formally defines culture as,

The accumulated shared learning of that group as it solves its problems of external adaptation and internal integration; which has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, feel, and behave in relation to those problems.

This accumulated learning is a pattern or system of beliefs, values, and behavioral norms that come to be taken for granted as basic assumptions and eventually drop out of awareness (p. 6).

2.4.3.2 Competing Theories of Cultural Categories

For decades, organizations have been branded based on a primary focus to discern the essence of the organization. Harrison's four “types” of cultures, as referenced by Schein, are

Power-oriented, Achievement-oriented, Role-oriented, and Support-oriented (p. 166). Schein (2010), referenced the Blake and Mouton's "Managerial Grid" to further discuss typologies of corporate culture (p. 167). Blake and Mouton's group dynamics dimensions were reduced to "task variables and *building and maintenance* variables" (Schein, 2010, p. 167). Goffee and Jones's "types" of cultures, as referenced by Schein, are *Fragmented, Mercenary, Communal, and Networked* (2010, p. 167). Cameron and Quinn, as referenced by Schein (2010) identified the following "types" of cultures from their work in the early 2000s: *Hierarchy, Clan, Market, and Adhocracy* (p. 168).

The outcomes of these researchers, combined with later findings of Pearson and Corlett, from the early 2000s, provided an internalized aspect of typology and challenged the research of Ancona in the 1980s. According to Schein (2010), Ancona's contribution to the field identified the relevance of "the relationship between the group (organization) and its external environments" (Schein, 2010, p. 167-168). Stemming from Ancona's research, Cameron and Quinn's research on organizational performance introduced a competing values dimensionality. According to Schein (2010), Cameron and Quinn's research on organizational performance recognizes external and internal components. Cameron and Quinn's research identified a structural component where structural is defined as "how stable or flexible the organization is and how externally or internally focused it is" (Schein, 2010, p. 168).

Schein's (2010) 4th edition describes four categories of culture. *Macrocultures*, the first category, can be thought of as national and ethnic groups possessing the stability and rigidity of the second insight to culture provided by Schein. *Organizational cultures*, the second category, "vary in strength and stability as a function of the length and emotional intensity of their actual history from the moment they were founded" (p. 3). *Subcultures* exist in occupations within an

organization. Subcultures can vary in structure and rigidity. *Microcultures* exist within organizations and subcultures and can be variable and dynamic. Microcultures are more closely related to Schein's first insight that described culture as forming and evolving based on daily interactions influencing cultural formation. Schein highlights the necessity of recognizing systems. For example, Schein (2010) suggests that small coherent units within organizations should be referred to as *microsystems* with existing *microcultures* since they are comprised of teams that "cut across occupational groups" (p. 2). Schein's research on identifying culture in groups and organizations highlights a holistic approach to identifying culture. Schein emphasizes how powerful internal influences of human capital are to decision-making, adaptability to external influences, and sustainability within an organization (Schein, 2017).

2.5 Considering Culture Summary

The discussion in this section encompasses both national culture and organizational culture. It is necessary to discuss both national and organizational culture because both contribute to the system in which this global health education endeavor is embedded. They are intertwined in this transnational biomedical research training program. Organizational awareness is key to identifying and addressing intangible impacts on systems, especially concerning weaknesses and gaps-whether in communication practices, value alignment, relationship building, etc. Failing to raise this awareness may serve as impediments to goal structuring and program and organizational development. To optimally develop knowledge sharing platforms to sustain successful global health education practices, organizations must evaluate and challenge their current practices and understanding of systems thinking and culture. From the literature, the following themes emerge:

- Understanding composites of organizational culture (Schein)
- Recognizing challenges and limitations of mental models that include deeply ingrained beliefs about the world and which operate outside of our awareness (Senge, Schein, Shimpi & Zirkel,)
- Recognizing systems ranging from ‘simple’ to ‘chaotic’ and developing mindful habits of approach (Garvey-Berger & Johnston, Snowden’s Cynefin framework)
- Recognizing and addressing detriments of polarization and power imbalances imposed by racial and cultural bias and prejudice (Shimpi & Zirkel, Lew)
- Recognizing influences of technology on human capital (Schein, Shimpi & Zirkel)
- Considering culture and the themes of external adaptation and internal integration (Schein, Fan)

Organizations embracing systems thinking open themselves to addressing challenges and incorporating strategies to minimize barriers that impact knowledge sharing and decision-making. Fan (2000) states, “a society’s culture provides its members with solutions to problems of external adaptation and internal integration” (p. 3). Evaluating global health education practices can help identify strengths and areas for program development.

2.6 The Art of Evaluation

Patton, McKegg, and Wehipeihana (2016) describe goals of developmental evaluation in the opening of their book *Developmental Evaluation Exemplars Principles in Practice* in the following way:

Developmental evaluation provides evaluative information and feedback to social

innovators, and their funders and supporters, to inform adaptive development of change initiatives in complex dynamic environments. Developmental evaluation brings to innovation and adaptation the processes of asking evaluative questions, applying evaluation logic, and gathering and reporting evaluative data, to inform and support the development of innovative projects, programs, initiatives, products, organizations, and/or systems change efforts with timely feedback (p. v).

Evaluation as practice is truly an art of integration. Before going in-depth into evaluation as practice, clarifying a common misunderstanding between assessment and evaluation is necessary. This next section provides clarity to this commonly misused terminology and supports the integral alignment of evaluation theory and evaluation practice.

2.6.1 Evolving Evaluation Theory and Practice

In the literature, there exists an underlying discussion about the purpose of evaluation. Embedded within this discussion is the suggestion to bridge a gap that exists between evaluation theorists and evaluation practitioners. This discussion began almost two decades ago and continues today through the work of numerous researchers and associations, such as the American Evaluation Association (AEA). The Eleanor Chelimsky Forum is an affiliate of the AEA that is aimed at discussing strategies to address the challenges of bridging the gap between evaluation theories and evaluation practice. In the literature, there is concern that evaluation practitioners are not grounding their evaluation practice in theory (Alkin & Christie, 2013; Chelimsky, 2012; Frye & Hemmer, 2012; Miller, 2010; Musick, 2006; Rog, 2015, Stufflebeam, 2016). These same authors think evaluation practitioners are provided an ideological perspective through evaluation theories.

The discourse in the literature also considers how ungrounded evaluation practices leave room for speculation in evaluation design and reproducibility as there is no clear support for reasoning roles and relationships between evaluator and evaluand, stakeholder roles and

participation, concept sensitization, methodology, and dissemination of findings (Abma & Stake, 2002; Chelimsky, 2012; Cook, 2010; Cousins & Whitmore, 1998; Frye & Hemmer, 2012; Goldie, 2006; Miller, 2010; Patton, 2011; Rossi, Lipsey, & Freeman, 2004).

Discussion among researchers within the literature concerning this disconnect has provided several opportunities for improvement in evaluation practice. First, the discussion has produced a need for practitioners and theorists to align evaluation terminology, practice, and theory consistently and in an open forum. Second, it has provided an avenue for a whole new series of research to discover how to bridge this gap. Third, it has provided avenues for how to ground practice in theory, using concrete terminology as opposed to general terms, which, according to Leviton (2015) and Hansen (2013), and Alkin & Christie (2008) was a limitation of earlier attempts to align theory and practice.

Stake, along with authors, such as Chelimsky (2012), Leviton (2015), and Morrow and Nkwake (2016), ask for bridging the gap between theory and practice. These authors argue for clearer articulation and communication of not just findings but assumptions of program evaluation design and process. The evolution of evaluation theory and practice, as described by Morrow and Nkwake series of publications in 2016, embraces the modern infatuation with rapid return of results. Although the argument for abandoning theoretical position and articulating logical framework appears practical for the speedy modern world and could be supported by practitioners, the art of evaluation practices could suffer greatly. Thinking about the requests to consider the impacts of rapid returns and modernization on the art of evaluation practice accentuates the necessity to consider cause-effect relationships in systems thinking.

A solid recommendation within the literature by Chelimsky is to create an open dialogue and open forums where practitioners and theorists can discuss what is going on in practice, align

it with theory, and find common ground where theory and practice can evolve together. However, Chelimsky's premise of developing a body of best practice can be argued against by social theorists as best practice and its constant state of fluctuation can be difficult to define! The problem, as outlined by Chelimsky (2012) and others, is the vastness associated with evaluation research. Rog (2015) and Rogers, Hacsı, Petrosino, and Heubner (2000) suggest integrating theory and practice by including within every report a more systematic and detailed discussion of "how" and "why" implementation choices were made. This suggestion by Rog is valued in this dissertation of practice.

2.6.2 Clarifying Confusion Between Assessment and Evaluation

Bodies of literature are available for exploring program evaluation and assessment of process and outcomes. However, after an extensive review of the vastly diverse body of evaluation literature, it became apparent to me that confusion exists in the terminology assessment compared to evaluation as Schugurensky highlights in the statement, "controversies have arisen about the difference between evaluation and assessment" (2013, p. 305). Musick (2006) states:

It is apparent that there is not a shared definition of the term *program evaluation*, particularly when it is associated with terminology referring to educational outcomes. Part of the confusion may be an issue of semantics. The term *evaluation* is often used interchangeably with the term *assessment* (p. 759).

For example, Gulikers, Biemans, Wesselink, and Vander Wel's (2013) article explains the necessity to align *formative assessment* practices and *summative assessment* practices to change conceptions. However, Gamble (2008) uses the terminology *formative evaluation* and *summative evaluation* practices when discussing developmental evaluation practices, thus reinforcing the

confusion in reporting, where assessment and evaluation are sometimes incorrectly used interchangeably. Holmboe, Sherbino, Long, Swing, and Frank (2010), on the other hand, correctly use the term *assessment* when discussing their study of the role of assessment in competency-based medical education. They describe the importance of using continuous, comprehensive, and elaborate assessment and feedback systems to drive the evaluations that emerge from these assessments. In this case, *assessment* is viewed as a piece of information that can be combined with other relatable pieces of information, from separate *assessments*, to produce an overall *evaluation*.

If the objective of a researcher is to conduct a reliable and reproducible evaluation, then the appropriate use of the terminology must be concrete and invisible to time. Therefore, it is necessary to make the distinction that assessment is comprehending a portion of a bigger picture. For example, one would perform an assessment to determine whether or not a procedure for a piece of machinery involved in a specific protocol provides useful information or develops skills. Evaluation, on the other hand, is an overall compilation of individual assessments to create a clear picture of specific outcomes and how context influences those outcomes.

2.6.3 An Argument for Not Being Too Narrow

Some evaluation literature embedded within medical education program evaluation, such as Musick (2006) and Holmboe *et al.* (2010) suggest shifting from process-oriented to outcomes-oriented models of evaluation, which are largely driven to placate accountability constraints. Weiss (1983) identified critiques of evaluation practices by stating that “One of the ways in which evaluators narrow their focus is by concentrating on the measurement of program outcomes” (p. 4). Being solely focused on outcomes for the sake of accountability gives insufficient attention to

the current context and operations inside the program. This claim supports the argument for not being too narrow and ultimately ignoring issues of operation in the program evaluation. Similar to Patton's (2016) utilization evaluation approach, Weiss's stakeholder evaluation approach aims to address "the full range of issues that matter to participants" through an open canvass of concerns (1983, p. 7).

Evaluation research is complexly diverse. Appreciating this diversity and finding more commonalities among the various approaches and models used is necessary for the evolution of the field of program evaluation (Campbell & Mark, 2015; Frye & Hemmer 2012). Narrow focus, such as severely context-driven evaluation leading to a disregard of process or value, is contributing to the gap between evaluation theory and practice (Frye & Hemmer, 2012; Patton, 2011). All are present in every case of every evaluation. Understandably, in an attempt to make program evaluation research manageable, these aspects have resulted in segregation and loss of in-depth understanding, thereby, reducing the significance of the evaluation. This sort of reductionist view is warned against in the literature through Aristotle's famous quote, "The whole is greater than the sum of its parts."

2.7 Literature Review Conclusion

The reader is encouraged to realize the complexities associated with global health education. Discussions in this review of scholarly literature highlight essential aspects of global health education as they relate to this dissertation of practice including:

- Global health descriptions
- Systems thinking and the organization

- Culture, both group culture and organizational culture
- Evaluation as a practice

Concepts in the global health section of this literature review emphasize knowledge sharing and the role higher education institutions and health-based organizations play in cultivating knowledge sharing. A program evaluation of this transnational training program supports global health education practices to cultivate knowledge mobilization and promote health education. Concepts in the systems thinking section of this literature review reinforce the necessity of gathering information in evaluation practices. Systems thinking helps identify the type of organization being evaluated. Understanding the big picture while identifying the pieces that construct the big picture are beneficial for program evaluation practices. Concepts in the culture section of this literature review provide a means to identify and understand how influential biases can be in evaluation as a practice. Stereotyping in the culture section and overcoming biases in the art of evaluation section emphasize the need for the evaluator to recognize and appreciate potential power imbalances and cultural influence when conducting an evaluation. This review of scholarly literature discussed evaluation as a practice to provide a solid foundation in support of *why* evaluations are necessary. The next section discussing inquiry design and methodology provides answers to *how* this evaluation is conducted. Themes outlined in this literature review support conducting a program evaluation to determine strengths and areas to develop in this transnational global health education endeavor.

3.0 Section 3. Inquiry Plan / Methodology

3.1 Inquiry Question

This program evaluation assessed stakeholder perspectives to identify program strengths and areas for development of labs hosting Visiting Chinese Medical Professionals (VCMP). The scope of this study is to define the mentoring and training of the visiting scholars from Tsinghua University School of Life Sciences. The information provided in this study can be used to guide laboratory interactions, operations, and future training practices.

Although this transnational collaboration between the University of Pittsburgh School of Medicine and Tsinghua University School of Life Sciences is an established program, effective April 2011 and renewed in May 2016, this study will be the first program evaluation. This dissertation of practice explores the transnational training program practices in medical research laboratories by asking:

1. What practices are in place to advance knowledge sharing and global health education practices in this transnational training program?
 1. What are the goals?
 2. What are program strengths, weaknesses, opportunities, and barriers?
 3. What knowledge sharing practices have evolved?
2. What gaps exist between organizational practice and espoused values?
 1. What are the emergent needs of the stakeholders?
 2. What are the stakeholders' espoused values?
 3. How do stakeholders' values align?

3. What does the system look like to support transnational biomedical research training at the University of Pittsburgh?

An understanding of stakeholders' perspectives of the program's current operations and preferred outcomes can distinguish effective knowledge sharing practices. Weiss (1983) and Patton *et al.* (2016) encourage the stakeholder approach to evaluation because it puts a premium on flexibility and on the ability to respond to present information needs. This program evaluation unveils knowledge sharing practices that work and preferred outcomes that can lead to improved communication and the development of capacity to support this transnational training program and other programs like this one (Furco, 2013; Garvey-Berger & Johnston, 2014). Also, the results of this study contribute to developing an understanding of the evolution of this transnational training program. Documenting the how's, why's, and what's through conducting this program evaluation contributes to the knowledge base necessary to contribute to capacity building, program sustainability, and the development of global health education practices.

3.2 Approach, Design, and Methods

This dissertation of practice used developmental evaluation tactics to identify parts of the system within the University of Pittsburgh School of Medicine supporting the transnational biomedical research training program with Tsinghua University School of Life Sciences. Gamble describes the value and inherent flexibility of the Developmental Evaluation as “supporting the process of innovation within an organization” (2008, p. 12). He elucidates by stating:

Initiatives that are innovative are often in a state of continuous development and adaptation, and they frequently unfold in a changing and unpredictable environment... Much is in flux: the framing of the issue can change, how the problem is conceptualized

evolves and various approaches are likely to be tested. Adaptations are largely driven by new learning and by changes in participants, partners, and context (Gamble, 2008, p.12). Developmental Evaluation practices, as described by Patton *et al.* (2016), thrive on the

discovery of emergent information. For example, Patton (2011), states:

The developmental evaluator inquiries into *developments*, tracks *developments*, facilitates interpretation of *developments* and their significance, and engages with innovators, change agents, program staff, participants in the process, and funders around making judgments about what is being developed, how it is being developed, the consequences and impacts of what has been developed, and the next stages of development (p. 227).

3.2.1 Inquiry Design

A critical aspect of developmental evaluation practices is understanding stakeholder perspectives. Assessing stakeholder perspectives to conduct an evaluation is referred to as the stakeholder evaluation approach (Weiss, 1983; Mathison, 2005; Patton, 2011). The stakeholder evaluation approach used in this study emphasizes communication and transmission of information. Focusing on communication patterns can be used for development purposes as opposed to judgment of program worthiness, a stereotype or misconception commonly related to program evaluation. Using a stakeholder evaluation approach to conduct this study, I compiled stakeholder perspectives on areas of strength and areas for program improvement to share with stakeholders (Owston, 2008; Patton *et al.*, 2016; Weiss, 1983).

Weiss recommends the stakeholder approach as it “addresses the issue of fairness directly by empowering an array of concerned groups to play an active part in the evaluation” (1983, p. 8). Patton heavily emphasizes the stakeholder approach to evaluation because of the focus on the stakeholders’ perspectives and their stake in the system. Clearly defining the different perspectives of stakeholders provides avenues for effective leadership, cohesive development, and system improvement, thus, identifying aspects of the training program that work and areas that need

development. This study used an assessment of stakeholder perspectives to understand and define the laboratory system of this transnational training program.

3.2.1.1 Lived and Espoused Values

Gamble (2008) suggests the evaluator be “attuned to two streams of data” (p. 31). The first stream of data is deciphering the espoused values associated with decisions or approaches (Gamble, 2008; Heifetz, *et al.*, 2009). The second stream of data is documenting and deciphering the emergent process (Gamble, 2008). This second stream of data collection provides information about the implications of decisions. Understanding decision making is part of evaluation practices.

The alignment of lived and espoused values can be important for program efficacy. Schein (2010) refers to espoused values as “articulated principles that the group claims to be trying to achieve” (p. 15). Heifetz *et al.* (2009) and Tourmen (2009) agree with Schein’s definition of espoused values. Lived values are best explained by using what Schein (2010) describes as *artifacts*. Lived values are those values that stakeholders display or follow on a day-to-day basis. These two values may not align. The best way to decipher lived values is to ask stakeholders to describe “what” they noticed when performing at their job (Schein, 2010). The best way to expose espoused values is to ask “why” individuals make the decisions they are making or “why” they are performing in a certain way (Schein, 2010). Deciphering the difference can reveal underlying assumptions about culture.

The strength of an evaluation is determined in defining the “what,” “why,” and in executing “how” the evaluation is conducted. This dissertation of practice combines Kirkpatrick’s four-level framework and Glasgow, Boles, and Vogt’s RE-AIM framework to discover the strengths and areas for development in this training program. Using Kirkpatrick’s four-level evaluation model as an instrument is a way to engage study participants when conducting this stakeholder-focused

developmental evaluation (Bates, 2004). Kirkpatrick's framework consists of the following measurement parameters:

- **Level 1: Reaction** - Measurement of the Reaction of stakeholders to the training program.
- **Level 2: Learning** – Measurement of Learning taking place as understood through stakeholder perspectives.
- **Level 3: Behavior** - Measurement of knowledge sharing Behavior in this training program.
- **Level 4: Results** – Defining the Resulting system in place that supports knowledge sharing in the transnational biomedical training program.

Kirkpatrick's framework has been in use since 1959 by many high-profile organizations (Kirkpatrick, 1996; Kirkpatrick, 1998; Kirkpatrick, 2009; Bates, 2004). This framework enables the identification of various program outcomes that move the evaluation of this transnational training program beyond measures of just learner satisfaction and value-based findings (Steinberg, 2013; Gamble, 2008; Frye & Hemmer, 2012).

Another instrument useful to identify stakeholders and conduct the inquiry in a stakeholder-focused evaluations is Russ Glasgow, Shawn Boles, and Tom Vogt's RE-AIM framework, as cited by Steinberg (2013). RE-AIM provides a framework that helps identify:

- **Reach:** Who the various stakeholders are and what parts of the institution might be affected.
- **Effectiveness:** Expectations of each group of stakeholders and how those expectations were met or not.
- **Adoption:** Challenges and successes of the training program and usefulness of the

program

- **Implementation:** Challenges and successes of the program initiation and training.
- **Maintenance:** Deciphering how the training program is useful to stakeholders, the adaptability of the program, and the sustainability of the program.

3.2.1.2 Bias Caution

A most significant area of concern during data collection is *researcher bias*. Nkwake and Morrow (2016), along with Patton (2011), urge the researcher to consider the veracity of researcher bias and the influence of evaluation assumptions, especially to those researchers who are close to the problem, which I am. I mention this point because I am very close to this study. To clarify, I began working at the University of Pittsburgh in 2001 as a research technician with the Department of Pulmonary, Asthma, Allergy, and Critical Care Medicine. It was during my time with Pulmonary Medicine that I had my first interaction with a visiting scholar from China. I changed my position within the University of Pittsburgh to become part of the Department of Surgery. Therefore, I have been directly responsible for training the Visiting Chinese Medical Professionals for over fifteen years.

To disclose any potential personal biases, I documented my perspective before I conducted interviews of any other study participants. Performing this tasks disclosed my beliefs and perspectives of the program before hearing the perspectives of other study participants. Developing a thorough understanding of how bias affects study results is important for evidence-based research (Mertens, 2015; Pannucci & Wilkins, 2010; Nkwake and Morrow, 2016; Patton, 2011).

3.2.2 Data Collection

This study uses multiple types of data collection methods. Seidman (2006) supports using multiple methods for data collection by stating, “research interests have many levels, and, as a result, multiple methods may be appropriate” (p. 11). Therefore, to inform stakeholders of knowledge sharing practices in the laboratory system, this study uses document analysis, personal interviews, and focus group interviews.

3.2.2.1 Document Analysis

Document analysis is beneficial for program evaluations because it allows the evaluator to look retrospectively at a program to determine the purpose of a program, and gathering facts about a program’s status (Mathison, 2005). Caulley (1983) advises evaluators to follow four rules when choosing documents for analysis:

Rule 1. Consider the *time interval* within which the document was written. The more time between the document origination and its review, the less potential reliability.

Rule 2. Consider the *purpose* of the written document. The more closely a document reflects an authentic method of record-keeping, the more dependable that document.

Rule 3. Consider the level of *confidentiality*. The more confidential, “the more ‘naked’ is the truth revealed by the document” (p. 23).

Rule 4. Consider the author’s *experience*. Testimonials of experienced reporters hold more validity and reliability than untrained reporters or casual reports.

According to Caulley (1983), a good document analysis involves working through documents with the intention of confirmation or rejection of a hypothesis. Caulley refers to this act as *Tracking* (p. 21).

Document analysis for this study consisted of exploring the education course materials, exit surveys designed and implemented by personnel from the University of Pittsburgh School of Medicine, and the contractual agreement between the University of Pittsburgh and Tsinghua University School of Life Sciences. Analyzing the education course materials document involved tracking knowledge that is being shared, exploring how that knowledge is being shared, and identifying requirements, goals, and objectives of the course. Analysis of the exit survey consisted of looking at 21 exit surveys provided to me by the University of Pittsburgh School of Medicine. I identified goals, strengths, weaknesses, opportunities, and barriers in each of the 21 exit surveys. These identified responses were then compiled for reporting. The next document analysis consisted of analyzing the correspondence between the two institutions. This analysis involved comparing the original agreement with the renewed agreement for changes and similarities, exploring and outlining collaborative goals and expectations, and exploring the language used to describe this knowledge sharing training program. The data generated from this document analysis can be compared to the actual training and research practices in the laboratory for the determination of goal attainment. Use of the data generated from the analysis of the described documents informed stakeholders of inquiry questions 1 and 2.

3.2.2.2 Personal Interview

The personal interview is another tool used as a method of inquiry in this study. Interviewing is one of the most historical and basic modes of inquiry (Seidman, 2006). I identify with the psychology behind Seidman's statement, "Interviewing provides access to the context of people's behavior and thereby provides a way for researchers to understand the meaning of that behavior" (p. 10). Patton, Seidman, and I share the belief that in "the root of in-depth interviewing is an interest in understanding the lived experience of other people and the meaning they make of

that experience” (Seidman, 2006, p. 9). It is in each “microcosm of consciousness” that personal experiences shape a story (Seidman, 2006, p. 7). Interviewing is an appropriate method of inquiry because the stakeholder approach to program evaluation specifically focuses on the perspectives and story each stakeholder is willing to share. The stories each stakeholder shares can help define the past, present, and future of this transnational training program.

A good interviewer must possess an interest in the story of other people (Seidman, 2006; Patton, 2011). Brinkman and Kvale (2015) provide extensive support for the necessity of learning the craft of the qualitative interview. Although listening and enjoying a good story sounds like enough, Kvale and Brinkman hone in on the importance of understanding the difficulties associated with interviewing as an inquiry method and encourage the interviewer to be as prepared as possible. Brinkman and Kvale (2015) state:

Professional interview research goes beyond a mastery of interviewing skills and conceptual knowledge of the subject matter of an inquiry. It also involves a theoretical reflection on the production of knowledge in research interviewing, such as addressing the epistemological and ethical issues of interviewing, as well as conceptions of interviewing practice. Conceiving of qualitative research interviewing as a method or as a craft is not a mere play of words, or only an abstract epistemological issue, but has concrete consequences for the practice and the learning of research interviewing (p. 88).

The two authors explain that a good interview requires not just tacit knowledge and interpersonal skills to navigate through the interview, but practice and situational experience. Kvale and Brinkman recommend having a researcher interview the interviewer to uncover assumptions and personal biases (2005, p. 93). Aspects to consider and practice as an interviewer include: the sound quality of the recording devices, clarification of inaudible answers, and clarity of questions (Kvale and Brinkman, 2005, p. 89). Kvale and Brinkman have outlined Seven Stages of Interview Inquiry, which integrate nicely with Rubin and Rubin’s (2012) *responsive interviewing* tactics described shortly. Kvale and Brinkman’s (2015) Seven Stages of Interview Inquiry are described as follows:

Thematizing. Thematizing includes the *what* and *why* of the investigation. It includes the formulation of the purpose and conception of the themes to be researched. Knowledge sharing practices and strengths and areas for development are themes of interest in this study.

Designing. Exploration of epistemology, i.e., the intended knowledge to be obtained from the study keeping moral code always in mind, involves the planning of the methods, validity, and scope of the research. Designing involves the discovery of the role of the interviewer as a “miner,” i.e., a knowledge collector or a “traveler,” i.e., a knowledge constructor (p. 48). Although I am a traveler by nature, this study was conducted through the mining approach to interviewing. The questions are structured, and specific intentions are associated with these questions that are to be “mined” from the interview.

Interviewing. Conducting the interviews is based on the approach deemed necessary by the interviewer. The interviews in this study are of a semi-structured design with predetermined questions encompassing knowledge sharing practices and strengths and areas for development as the major themes of this study.

Transcribing. Preparing the interviews for analysis involved transcribing the oral interviews into written language.

Analyzing. Based on the purpose of the research and investigation, analyzing can take many forms. Analysis of this study is discussed in the Data Analysis and Interpretation section.

Verifying. Establishing the validity and reliability of the research findings is determined by the consistency of the results, i.e., reliability, and whether the study produced what it was intended to produce, i.e., validity.

Reporting. Communicating the findings of the study in an ethical, systematic, and

understandable product using visual representations and clear language.

Schein (2010) and Patton (2011) provide in-depth guidance on designing interview questions to deal with reality testing of stakeholder perspectives. Reality testing compares espoused values to organizational behaviors, which tackle inquiry questions 1-3. Deciphering espoused values, artifact, and operating assumptions is necessary for identifying the development potential of this transnational training program. It is important when designing interview questions to consider building relationships between the interviewer and the interviewee to obtain a real picture of the training program and its outcomes (Mertens, 2015; Rubin & Rubin, 2012). Also recommended by Seidman (2006) is that interviewers curb their egos, which can interfere with an interviewer's ability to listen and understand the narrative taking place in the interview. Even more important than just designing the line of questioning is being able to use what Rubin and Rubin (2012) describe as *responsive interviewing*, which entails active listening and tailoring interview questions in real-time based on the interviewee's responses. Gamble (2008) suggests a developmental evaluator document with each interview:

- process observations
- points of tension
- implicit decisions
- assumptions made
- emerging themes and patterns

Each *responsive interview* led to new information that provided qualitative data for mapping the interconnectedness of the stakeholders and the system (Rubin & Rubin, 2012). Gamble (2008) and Patton *et al.* (2016) suggest using reflective practices to assess collected data. Reflective practices and responsive interviewing help answer questions related to this study, such

as:

- How is knowledge sharing working within the system? What evidence indicates that the process is or is not working? Where are places for development?
- What are the organization's real-time feedback mechanisms for tracking changes/growth? What evidence indicates that the process is working?
- Where are the areas of disconnect in the system? How can we develop those areas to overcome the disconnect?
- Where are strengths in the system? What made those areas strong? What can we learn from that strength?
- What barriers exist among stakeholders?

A thorough exploration of these concepts led to the interview questions in Appendix A, Table A1, A2, and A3. These tables are divided into columns representing the interview questions themselves and the correlation between interview questions and inquiry questions. Visual Aid B1 in Appendix B represents the personal interview protocol snapshot. The personal interview protocol used in this study is found in Appendix D. Correspondence frameworks for initiating and conducting study participation are found in appendices F, G, H, and I . Each study participant/stakeholder interview was audio recorded only. Due to the global impact of SARS-CoV-2, COVID-19, this study was forced to follow necessary hygiene and safety restrictions and guidelines as outlined by the Center for Disease Control and the University of Pittsburgh. These restrictions required all personal interview meetings be conducted virtually. I chose either ZOOM or TEAMS applications to conduct the interviews to ensure study participant safety. Faculty and Visiting Scholar Medical Professionals (VCMP) study participant data was collected using personal interviews.

3.2.2.3 Focus Groups

Focus group interviewing as an inquiry method for this study involves a multiple-category design with four to six randomly chosen stakeholders from the resident personnel study participant group. It involved cultivating a safe, comfortable space for sharing feelings and perceptions by structuring groups within hierarchical levels and cohorts.

The foundation for focus groups began as a result of social scientists believing that personal interviewing possessed too much potential for interviewer biases (Krueger & Casey, 2015). In the early 1900s, prominent social scientists Stuart A. Rice and Robert K. Merton, Marjorie Fiske, and Patricia L. Kendall used focus groups as a nondirective interviewing technique (Krueger & Casey, 2015). Merton conducted some of the first focus group interviews for data collection on the morale of U.S. military troops in WWII (Mathison, 2005; Krueger & Casey, 2015).

Focus group interviews, as a method of collecting data, gained momentum not from the efforts of social scientists or academics, but rather from market researchers in the 1950s (Mathison, 2005; Krueger and Casey, 2015). Focus group interviewing provided a way to stay in touch with potential customers and discover ways to design products and test advertising campaigns (Krueger and Casey, 2015). About thirty years later, academics “rediscovered” focus group interviews as a research technique only after marketing researchers proved the benefits of using focus group interviews. However, the technique used by marketing researchers had to be adapted to academic research settings and scientific rigor for academic credibility. The adaptation brought academics back full circle to the research of Robert Merton’s investigation of WWII military morale from fifty years prior. Robert Merton’s work is credited as a significant contributor to the origination and foundation of focus group interviewing as a research method (Mathison, 2005; Krueger & Casey, 2015).

Focus groups differ from personal interviews in several ways. First, focus groups are characterized by small groups of three to twelve people that share a commonality as opposed to a one-on-one interview. That commonality is determined by both the purpose of the study and the researcher (Krueger & Casey, 2015). Similar to the personal interview, the role of the researcher in the focus group interview is that of a listener, observer, and analyzer (Krueger & Casey, 2015). The researcher's role in the focus group differs from his/her role in the personal interview. The focus group researcher takes on the task of a moderator. The purpose of a moderator in focus groups entails providing study participants with an equal opportunity to have a voice, as well as creating a safe place to share that voice. The exploration of feelings and thought processes associated with the focus group discussion is driven by the researcher's ability to encouraging heartfelt responses by thoughtfully designed open-ended questions posed in a safe and open environment (Krueger & Casey, 2015).

Krueger and Casey (2015) recommend using focus groups when “looking for a range of opinions, perceptions, ideas, or feelings that people have about something like an issue, behavior, practice, policy, program, or idea” (p. 21). Krueger and Casey also recommend using focus groups when trying to understand perspectives among various “groups or categories of people” within an organization (p. 22). To effectively incorporate the focus group as a method of inquiry, the researcher needs to plan three to four focus groups with each stakeholder category with the objective of reaching theoretical saturation (Krueger and Casey, 2015, p. 27). *Theoretical saturation* is defined by Krueger and Casey as reaching a point in focus group interviews where no new information or ideas are heard (2015, p. 23).

Focus groups are useful for decision-making. Krueger & Casey (2015) outline three points where focus groups are beneficial. First, focus groups help decision-makers gain understanding

through gathering information from stakeholders about feelings and perceptions of ideas as a needs assessment before program implementation and the initiation of change. Second, focus groups offer a useful method for obtaining feedback from stakeholders about a program that is already in place or one that has recently finished. Third, a focus group can be used to obtain feedback to identify what works and what does not work in a program, places for program improvement, and whether a program meets its predetermined goals. Although similar information can be collected through personal interviews, focus groups provide information on behavior, collectively (Krueger & Casey, 2015). Focus groups provide insight into concerns and issues within an organization through dynamic group discussion, listening, and observation (Krueger & Casey, 2015).

When forming groups for focus group interviews, Krueger and Casey (2015) recommend careful consideration be given to power dynamics. They suggest the researcher avoid mixing across hierarchical levels when forming groups because it tends to abolish a safe place to share perceptions and opinions openly. Krueger and Casey (2015) also recommended keeping the purpose of the study in mind when planning focus groups. They advise the researcher to think about what you will do with the information and “what types of people do you want to be able to say something about in your final report” (2015, p.25).

Focus groups can use one of two routes for acquiring information, the heart or mind (Krueger & Casey, 2015). The questioning route, i.e., the mind, relies on specific predetermined questions for moderation where an intellectual contribution is the focus. The topic guide route relies on an outline of main themes or topics to guide the discussion and can often elicit a more emotionally based response referred to as the heart approach (Krueger & Casey, 2015). Whether the objective of the focus group is to discover emotions and feelings associated with certain topics or behaviors or to discover the topics themselves, focus group questions should do the following

seven things: stimulate conversation, be clear, easy to say, short, open-ended, one-dimensional, and guide the direction of the conversation (Krueger & Casey, 2015, p. 41-43).

As a standard practice for conducting focus group interviews, Krueger and Casey (2015), as well as Mathison (2005), emphasize the importance of preparation. Both resources discuss the necessity of “careful planning, good questions, skilled moderation of the discussion, and systematic and verifiable data analysis” (Mathison, 2005, p. 159). Krueger and Casey (2015) recommend designing questions in the following order: an opening question, an introductory question, a transition question, key questions, and an ending question (p. 44-47).

Opening question. The opening question is used to get study participants to talk. This question is not used for analysis. The opening question should not emphasize or point out differences or inequalities in the group. It is used to develop a relationship among the group and create a comfort level that stimulates open communication for study participants.

Introductory question. The introductory question is used to introduce the topic of discussion. Responses to the introductory question give the researcher a sense of study participants’ perspective on the topic, which provides insight on how to effectively moderate the focus group.

Transition question. Transition questions link the introductory question and the key questions. Responses to these questions enlighten study participants to the perspectives of other people in the group. Transition questions ask study participants to go into more depth on experiences to gather information about emotions and feelings associated with those experiences.

Key question. Key questions should be limited to between four and six. This category of questions provides most of the data for analysis. The key questions section of the focus groups requires the most time to complete.

Ending question. The ending question should be designed to help the study participants reflect on the comments and discussion of the focus group. Responses to these questions are considered by Krueger and Casey to be critical to the analysis. Ending questions have subcategories: *all things considered question*, used to determine study participants' final position on a topic of interest, the *summary question*, used to elicit a response from study participants about the summary of the focus group, and the *final question*, used to ensure nothing was missed in the focus group discussion. The final question asks something along the lines of "is there anything you would like to discuss that we may have missed" (Krueger & Casey, 2015, p. 46). The final question is prefaced by a short overview of the study that provides more detail than the introduction.

This study used multiple-category design focus group sessions with resident personnel (RP). To help cultivate safe, comfortable spaces for sharing feelings and perceptions, the focus group design for this study has each group remaining within their hierarchical level. For example, laboratory managers were interviewed with other laboratory managers, and resident personnel were interviewed with other resident personnel.

There are many participatory ways to conduct a focus group interview. The researcher could ask study participants to draw pictures that represent an idea or theme then ask for a group discussion to explain those pictures (Krueger & Casey, 2015). The researcher could provoke discussion by asking study participants to construct a flow chart or diagram to explain how each participant interprets how something might work (Krueger & Casey, 2015). This study uses mind mapping, described by Krueger and Casey (2015) as a "visual depiction of how an individual thinks about a topic or issue" (Krueger & Casey, 2015, p. 55). The study participants are asked to participate in the cognitive exercise of word association. Using word association, each participant builds on the responses of other participants to generate a thought cloud. That thought cloud was

built upon for mind mapping aspects of the training that work and areas for development. Appendix A, Appendix B, and Appendices L1-L5 outline the predetermined questions that guide the focus group interviews and communications used to discover stakeholder perspectives in this study. Again, due to the global impact of SARS-CoV-2, COVID-19, this study was forced to follow necessary hygiene and safety restrictions and guidelines as outlined by the Center for Disease Control and the University of Pittsburgh. These restrictions required all focus group interviews to be conducted virtually. I chose either ZOOM or TEAMS applications to conduct the interviews to ensure study participant safety.

3.3 Participants in the Study

Through using the RE-AIM framework, the following subjects were identified as individuals that should be included as study participants in this study: Faculty, Resident Personnel (RP), i.e., technical staff, and the Visiting Chinese Medical Professionals (VCMP). Gender was not included in the study participant selection criteria. These groups of study participants, who are also stakeholders, were chosen because they have direct relationships with the training program and they can incorporate findings from this study to guide future interactions.

Of the fifty-five faculty members supporting visiting scholars, ten of them were randomly chosen as study participants designated as Faculty. The Faculty involved in this study all possess either a Ph.D., MD, or MD/Ph.D. degree. Some faculty are practicing clinicians who function as both a practicing physician and as a faculty researcher. Some faculty function as instructors and researchers.

The resident personnel all hold titles of Research Scientist or Research I-V functioning as laboratory managers, researchers, and laboratory technicians. The level of education within the resident personnel category varies from requiring a bachelor's degree to a doctorate. The job responsibilities range from cleaning glassware, making solutions, and routine laboratory maintenance to collaborating on conceptual project design and conducting complex experiments using highly specialized equipment and computations. Some laboratories host medical students who are gaining experience in research and expanding their knowledge-base. Some laboratories host medical residents. Therefore, the group designated as resident personnel can range from recent college graduates whose first job is a research technician in a laboratory to seasoned veterans of the laboratory with decades of experience and extensive knowledge on experiment design and execution. Also included in the resident personnel group are medical doctors who are in their postgraduate years of training as residents and are completing their laboratory rotation years.

Finally, the visiting scholars, referred to in this study as Visiting Chinese Medical Professionals (VCMP), are those transnational scholars from Tsinghua University School of Life Sciences paired with the randomly chosen faculty mentors. The VCMP are all students pursuing medical doctor degrees from Tsinghua University School of Life Sciences. These students must have completed at least three-and-a-half years of education at Tsinghua University School of Life Sciences. The students must demonstrate proficiency in speaking English based on scores from either TOEFL, IELTS, or the Chinese national examination. The VCMP must be in excellent academic standing.

None of the study participants were chosen based on gender identity since all participants are randomly selected without knowledge of gender designations or demographics of any kind. All study participants operate under the School of Medicine. The randomization took place by

putting the list of participating faculty mentors' names, provided by the School of Medicine, into an excel sheet and randomizing that list using the Randomization function =VLOOKUP(LARGE(\$B\$2:\$B\$67,A2),\$B\$2:\$C\$67,2,FALSE). The first ten faculty members in the list after the randomization were selected for personal interviewees. If a faculty member did not respond to the study participation request or chose to not participate, then the next faculty member in the list was chosen. The ten randomly selected faculty mentors all had research laboratories comprised of resident personnel and administrators who facilitate laboratory operations. Faculty and Visiting Chinese Medical Professionals had one-on-one interviews.

Focus group interviews are used for Resident Personnel (RP). This study has focus group interview sessions each with 2-4 study participants per group. Focus groups for corresponding resident personnel occur by mixing laboratory personnel from laboratories who hosted a visiting scholar. This program evaluation necessitates several separate sessions of focus group interviews for resident personnel that follow the same process. This study originally designated the visiting Chinese Medical Professionals (VCMP) focus group sessions. However, the VCMP preferred to have one-on-one interviews. Table 1 below provides a visual snapshot summary of the mixed methods of inquiry for this dissertation of practice.

Table 1 Mixed Methods Data Collection Overview

Method	Document or Study Participants/Stakeholders	Number of Participants
Document Analysis	MLB Curriculum	-
	Collaborative Education Agreements	-
	UPSOM Exit Interview Surveys	21
Personal Interviews	Faculty Mentors	10
	Visiting Scholars	5
Focus Groups	Resident Personnel - Technicians	6
		(3 groups of 2)

3.4 Data Analysis and Interpretation

Conducting the interviews and focus groups and coding that data provides qualitative data for reporting. Data from document analysis, interviews, and focus groups are analyzed and interpreted using Krueger and Casey's (2015) Constant Comparative Analytic Framework and the Triangulated Learning Framework adapted by Patton (2011).

The analysis of this study is embedded in reflective practice. Reflective practice is described by Schön (1983), Patton et al. (2016), and Gamble (2008) as an iterative process that drives developmental evaluations involving a conscious effort to examine emotions, experiences, actions, and responses to enhance understanding. Reflective practices used in this study include post-interview and post-focus group researcher reflections. After each interview and focus group

session, the researcher documents what stood out, what questions and processes were difficult, what elicited positive or negative responses by the interviewee, what elicited apprehension, and additional thoughts and feelings about process, behavior, meaning, and outcomes of each interview and focus group (Kvale & Brinkman, 2009; Krueger & Casey, 2015, Patton, 2016). Using the Triangulated Learning Framework and the Constant Comparative Analytic Framework, the researcher is looking for patterns, similarities, differences, and development of theory by identifying patterns in the data and discovering relationships among ideas and across participant groups (Krueger & Casey, 2015).

Kvale and Brinkman's (2019) seven stages of interviewing outlined previously (2009) specify the data must be analyzed and verified before reporting. Data needs to be transcribed and coded to identify themes before triangulating and comparing using the comparative analytic framework. Data analysis is conducted through:

1. Transcribing each recorded interview. After transcribing the interview, NVivo 11 software can be used to code specific themes identified by the researcher, specifically, study participant's values, language that identifies strengths and areas for development, and language identifying knowledge sharing practices. NVivo 11 is software designed for distinguishing and quantifying qualitative data.
2. Document analysis of the MLB1 coursework curriculum. Document analysis of curriculum coursework involves using NVivo 11 software and coding practices too. Identifying differences in goals and requirements between the original curriculum compared to the current curriculum is part of document analysis for this study. Identifying language that places value on something is part of document analysis for this study. Identifying expectations, goals, and objectives to compare to contractual

goals, expectations, and objectives is part of this document analysis.

3. Document analysis of Collaborative Education and Research Agreements (contracts).

Reviewing existing agreements to identify contractual obligations and outlined expectations to determine if the institution is meeting those expectations and obligations is part of the document analysis for this study. Identifying language used to define expectations and obligations, as well as coding themes using language that describes how those expectations and obligations are being met, is part of document analysis.

Verification of the data, as discussed by Kvale and Brinkman (2019), Krueger and Casey (2015), Patton (2011), and Galletta (2013) involves ensuring the trustworthiness of the interpretation of the data. Integrating concept mapping, triangulation, and comparative analysis for data interpretation enhances scientific rigor and study validity.

Concept mapping. Concept mapping is used to make connections across identified themes from the interviews and focus groups. Concept mapping of the system is recommended repeatedly in the literature as both a reflective practice for development and as a reporting tactic (Alkin and Christie, 2004; Mathison, 2005). Concept mapping methodology provides a way to systematically connect themes and identify realities in a visual display to encourage stakeholders to think about ideas and how those ideas fit into the big picture. Hansen *et al.* (2013) states, “we believe that creating ...visual representations may aid research on evaluation” (p. 34). For this study, concept mapping is a feature of the final report. A systems perspective, as presented by Walker, Senecah, and Daniels’s collaborative learning processes, states, “issues are connected, and parties or stakeholders are interdependent. Voice and influence gain strength from the parties recognizing their interdependence” (2006, p. 196). This concept mapping process, referred to by Patton (2011)

as *Dynamical Actual-Ideal Comparative Evaluation Framework*, reveals stakeholders' perceived reality regarding functions and design. Concept mapping of the present system to identify the interconnectedness of the major themes of interest in this dissertation of practice involves identifying: system strengths, areas to develop, and knowledge sharing practices in this global health education niche.

Triangulation. The Triangulated Learning Framework used in this study for data analysis and interpretation involves the process of gathering data from multiple sources for comparison, i.e., triangulation (Mathison, 2005; Patton, 2011). Triangulation of the data acquired from the various study participants, i.e., stakeholders, adds depth to the exploration of how actions are driven. This exploration forces the researcher to distinguish beliefs from knowledge. The Triangulated Learning Framework from Patton (2011) depicts the interplay between Actions, Knowledge, and Beliefs/Values. Patton (2011) explains, "Action flows from a combination of what we believe and what we know" (p. 233). This framework describes the relationship between values/beliefs, knowledge, and action. This framework is relevant to this study because it depicts the framework for deciphering espoused values and organizational behaviors of stakeholders as they pertain to the training program.

Defining the system in place to support this transnational training program involves both revealing what stakeholders perceive the system in place to be as well as what barriers exist. Some of the themes considered at this phase of inquiry design include: espoused values and organizational behaviors, knowledge sharing practices, barriers of knowledge sharing and intellectual property, and program strengths and areas for development. To ensure anonymity, the data will be grouped under general headings of distinction, such as Visionaries, Policy-Makers, Street-Level Managers, and Day-to-Day Operations Specialists.

SWOT/SWOB. A Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis of the interviews and focus groups is used to accurately design a system map and address the research questions outlined in this study. The “T,” which stands for *Threats* in this SWOT analysis, is replaced with “B” to represent *Barriers* that exist in knowledge sharing. Because this evaluation exists in a world of academic medical research, performing a SWOB of the existing culture is fitting. The primary objective of a SWOT/SWOB analysis is to develop a full understanding of factors influencing decision-making. Performing a SWOB analysis in this context informs the researcher of how this program has evolved and transformed into its current operating patterns. A SWOB analysis provides information that covers the main outcomes of interest, including program strengths, weaknesses, opportunities for development, and barriers that exist within this program.

3.5 Proposed Demonstration of Practice

The final demonstration of practice for this program evaluation focuses on the early stages of initiating change in the transnational training program. As a first step, I will electronically distribute an executive summary and Panopto presentation to my study committee members and two other executives in charge of this transnational training program. This executive summary and presentation will inform these stakeholders of the study findings. Following the electronic distribution of this executive summary and Panopto presentation, I will extend an invitation to meet with the executives to discuss the study findings, get feedback, explore future directions, and, optimistically, generate buy-in. Since stakeholder involvement is a vital piece of a stakeholder evaluation, extending the evaluation findings is important. Extension of the findings is necessary for elucidating stakeholder interests, encouraging agency and feedback, and systematically

planning for future evaluations. Table 2 summarizes the steps of the proposed demonstration of practice.

Table 2 Summary of Proposed Demonstration of Practice

Step #	Description of Steps
Step 1	Distribution of Executive Summary and Panopto Presentation of Current Evaluation Results/Findings.
Step 2	Open Discussion with Executive Level Training Program Stakeholders of Current Evaluation Results and Findings.

4.0 Section 4. Results

Section 4 contains the results from the analysis of data from secondary documents, including Collaborative Education Agreements, MLB course curriculum, the 21 Visiting Scholar exit interview surveys conducted by administrative personnel of the University of Pittsburgh School of Medicine (UPSOM), 16 one-on-one interviews and 3 focus group interviews. The perspectives of Faculty, Visiting Chinese Medical Professionals (VCMP), and Resident Personnel (RP) study participants are used to answer this program evaluation's inquiry questions:

1. What practices are in place to advance knowledge sharing and global health education practices in this transnational training program?
 1. What are the goals?
 2. What are program strengths, weaknesses, opportunities, and barriers?
 3. What knowledge sharing practices have evolved?
2. What gaps exist between organizational practice and espoused values?
 1. What are the emergent needs of the stakeholders?
 2. What are the stakeholders' espoused values?
 3. How do stakeholders' values align?
3. What does the system look like that supports transnational biomedical research training at the University of Pittsburgh?

The first part of this section describes the results of the Strengths, Weaknesses, Opportunities, and Barriers (SWOB) analysis. Next, this section identifies stakeholders' goals and shows how stakeholders view productivity. Third, this section identifies the current system in place to advance knowledge sharing and global health education practices. Fourth is a summary of the

findings. Analysis of the data from this study resulted in the identification and definition of A Scientific Skill Set. A Scientific Skill Set is defined as the development of: critical thinking skills, designing scientific questions, mastering the scientific method, and data reporting and is used throughout the results section.

4.1 SWOB Analysis

The SWOB analysis is useful for identifying internal and external influences in this transnational training program. Each arm of the SWOB analysis opens with a mind map and brief narrative representing the findings from each study participant group. Following the mind maps for each study participant group is a Venn diagram visual depiction of the main themes identified from each study participant group's responses. The Venn diagrams show how study participant perspectives align. Tables identifying coding strategies, interview and survey questions, and corresponding inquiry questions used to assess program strengths, weaknesses, opportunities, and barriers (SWOB) in this training program are outlined in appendices L1 through L4.

4.1.1 Program Strengths

The first arm of the SWOB analysis reveals program strengths in this transnational training program. Asking questions to assess what works and what stakeholders identify as successful facilitates the identification of program strengths. Table L1 in appendix L identifies coding strategies, interview and survey questions, and corresponding study inquiry questions used to assess program strengths. The mind maps in Figure 2-4 represent program strengths by study

participant group. The program strengths narrative following the mind maps provides a detailed explanation of main themes and the sub themes. Main themes are boldface and indented. Subthemes supporting each main theme are indented and italicized. Seventy-one of 120, or 59.2% of VCMP exit interview survey responses are coded as program strengths. Program strengths represent an overall 41.6% of study participant interview responses.

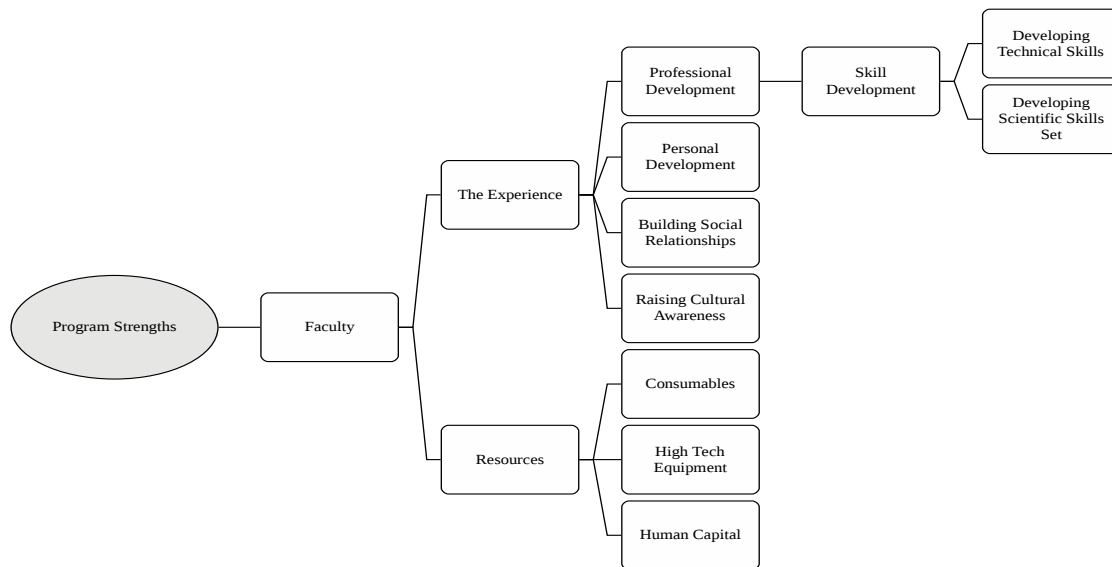


Figure 2 Mind Map Depicting Program Strengths as Identified by Faculty Study Participants

Note. The mind map depicted in Figure 2 represents program strengths identified in the Faculty study participant group. Two major themes are identified as program strengths from analyzing data generated from Faculty study participants in this transnational training program including: 1. The Experience and 2. Resources. Interpretations that make meaning of similarities and differences between study participant groups of each theme and the identified subthemes are described in the program strengths narrative following figures 2-4 mind map visual representations.

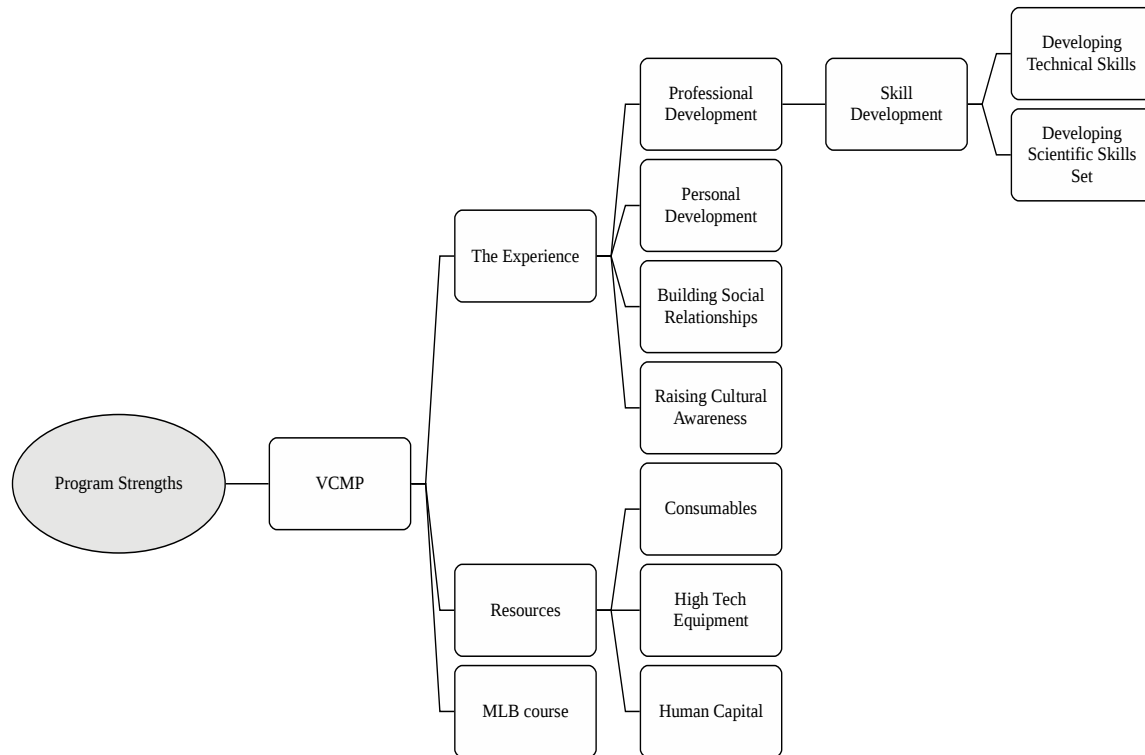


Figure 3 Mind Map Depicting Program Strengths as Identified by Visiting Chinese Medical Professional (VCMP) Study Participants

Note. The mind map depicted in Figure 3 represents program strengths identified in the VCMP study participant group. Three major themes are identified as program strengths from VCMP study participant groups in this transnational training program including: 1. The Experience, 2. The Methods and Logics in Biomedicine (MLB) course, and 3. Resources. Interpretations that make meaning of similarities and differences between study participant groups of each theme and the identified subthemes are described in the program strengths narrative following figures 2-4 mind map visualizations. The VCMP and Faculty mind maps present similarities in themes identified as program strengths.

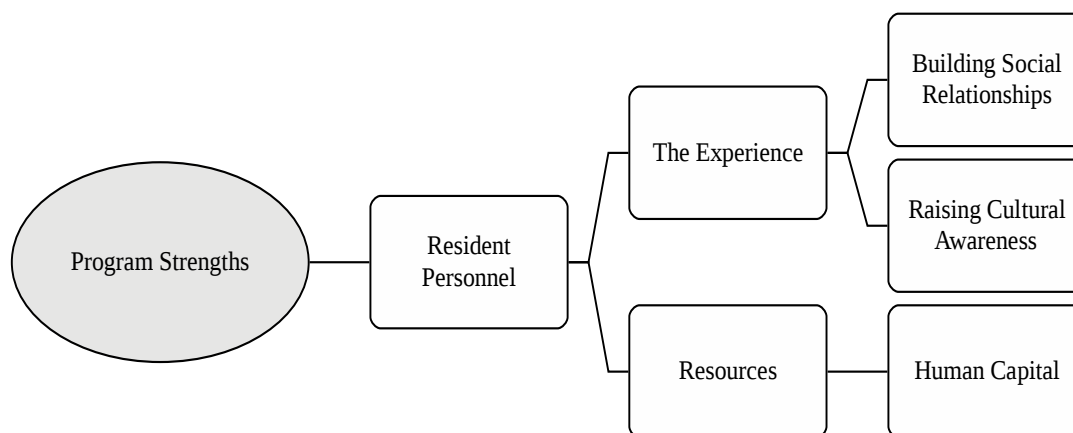


Figure 4 Mind Map Depicting Program Strengths as Identified by Resident Personnel (RP) Study Participants

Note. Figure 4 is a mind map representing program strengths identified from the RP study participant group. Two major themes are identified as program strengths from the RP study participant data in this transnational training program including: 1. The Experience and 2. Resources. Interpretations that make meaning of similarities and differences between study participant groups of each theme and the identified subthemes are described in the program strengths narrative. The RP study participant group mind map characterizes a less complex mind map than either the VCMP or Faculty study participant mind maps.

4.1.1.1 Program Strengths Narrative

4.1.1.1.1 The Experience

All three stakeholder groups identify the experience of this knowledge sharing experience conducting basic science research in the United States as a program strength.

4.1.1.1.1.1 Professional Development

Fourteen of 71, or 19.7% of VCMP exit survey responses identify aspects of professional development as something they like the most. Ten of 10 Faculty stakeholders identify being a part of the evolution of a young scientist as bringing them satisfaction. Faculty recognize the experience

of training and mentoring VCMP as areas of professional development. RP stakeholder interview responses did not show any correlation to professional development.

4.1.1.1.1.2 Skill Set Development

Faculty and Visiting Chinese Medical Professional stakeholder groups identify gaining knowledge of basic science skills as a program strength. Specifically, these two stakeholder groups identify developing technical expertise and development of scientific skill sets as program strengths. To redefine, a scientific skill set is defined as the development of: critical thinking skills, designing scientific questions, mastering the scientific method, and data reporting. One VCMP stated, “Both the lab training and the MLB course have trained me to think like a scientist.” One Faculty stakeholder stated regarding the evolution of young scientist, “I think from a science standpoint, the thing that is really validating for me is when that light bulb goes off and they get that experiment to work or they get that concept they have been working on and it is like they are really proud of you know having accomplished that.” Thirty of 71, or 42.3% of VCMP study participant exit survey responses refer to technical expertise and scientific skill sets development.

Faculty and VCMP study participants reference RP stakeholders as critical to knowledge sharing and technical skill development. Although RP study participant responses identify teaching basic technical skills as a satisfying characteristic of the program, RP recognize skill development as more of a requirement and, therefore, not a program strength.

4.1.1.1.1.3 Personal Development

Six of 71, or 8.5% of responses from the VCMP exit survey data support personal development as a program strength. VCMP interviews reference personal growth, which equates to having individual agency and owning responsibilities of supporting oneself in a new culture and country as a program strength.

4.1.1.1.4 Building Social Relationships and Raising Cultural Awareness

In addition to personal and professional development, cultural awareness is mentioned by all three stakeholder groups. These stakeholder groups identify heightened cultural awareness and building social relationships as an aspect of this training program that brings them satisfaction. Eleven of 71, or 15.5% of VCMP survey responses identify the social aspect of the lab experience as something they like the most.

Data from the VCMP stakeholder group identifies the personal connections made during the laboratory experience as something that is satisfying and, therefore, a program strength. Responses from Faculty stakeholders reveal appreciation for the diversity this program offers the laboratory. Responses from RP study participants identify the personal connections made with the visiting scholars and being supportive of VCMP as satisfying, and, therefore, program strengths.

4.1.1.1.2 Resources

All three stakeholder groups identify resources as program strength. However, resource is defined differently by each stakeholder group. Resource definitions are broken down below and represented in Figures 2 & 3.

4.1.1.1.2.1 Consumable Resources

Data from VCMP and Faculty study participants indicates the availability of consumable resources and high-tech scientific equipment as being strengths of this training program. Consumable resources refer to pre made materials that can be ordered. Four of 71, or 5.6% of VCMP exit interview survey data identify consumable resources as a strength. RP data did not reference consumable resources. One VCMP stakeholder stated, “I think the greatest difference is in the USA, ... Actually, there were so many machines in the American lab which could help us to finish some meaningless [*sic*] work. For example, the western blot gel, which would take me a

while to make it in China, could be bought from some companies directly. These changes make the lab work more interesting and efficient.” Another VCMP study participant stated, “labs in US have more fundings [sic] and better equipments [sic] and techniques compared to China. So, it can be easier to do experiments in US.”

4.1.1.1.2.2 Human Capital as a Resource

Data from VCMP, Faculty, and RP study participants identify themselves as a human capital resource. Performing tasks such as helping to move projects forward, offering support, and fostering potential international collaboration bring satisfaction to study participants and are associated with program strengths. One Faculty study participant acknowledged the potential for exploitation in this structure, “Just how they approach work and also you know just their level of dedication to not just their research but their mentors, I mean they will do anything you ask them to do. You know, which of course mentors have to be careful not to abuse that, and which, unfortunately, there are some that do. You know that is the unfortunate reality.”

4.1.1.1.3 Methods and Logic in Biomedicine Course (MLB)

The data shows varied experiences by the VCMP with the MLB course. VCMP identify group facilitators as playing the main role in shaping the perspective of the MLB course. The variety of VCMP responses to the MLB course necessitate discussion space in each section of this SWOB analysis. VCMP stakeholder interviews identify comradery with peer groups and developing skill sets for how to organize data for reporting and presentation as course strengths and, therefore, program strengths.

Faculty and RP study participants express limited to no knowledge of the MLB course curriculum or obligations associated with the MLB course.

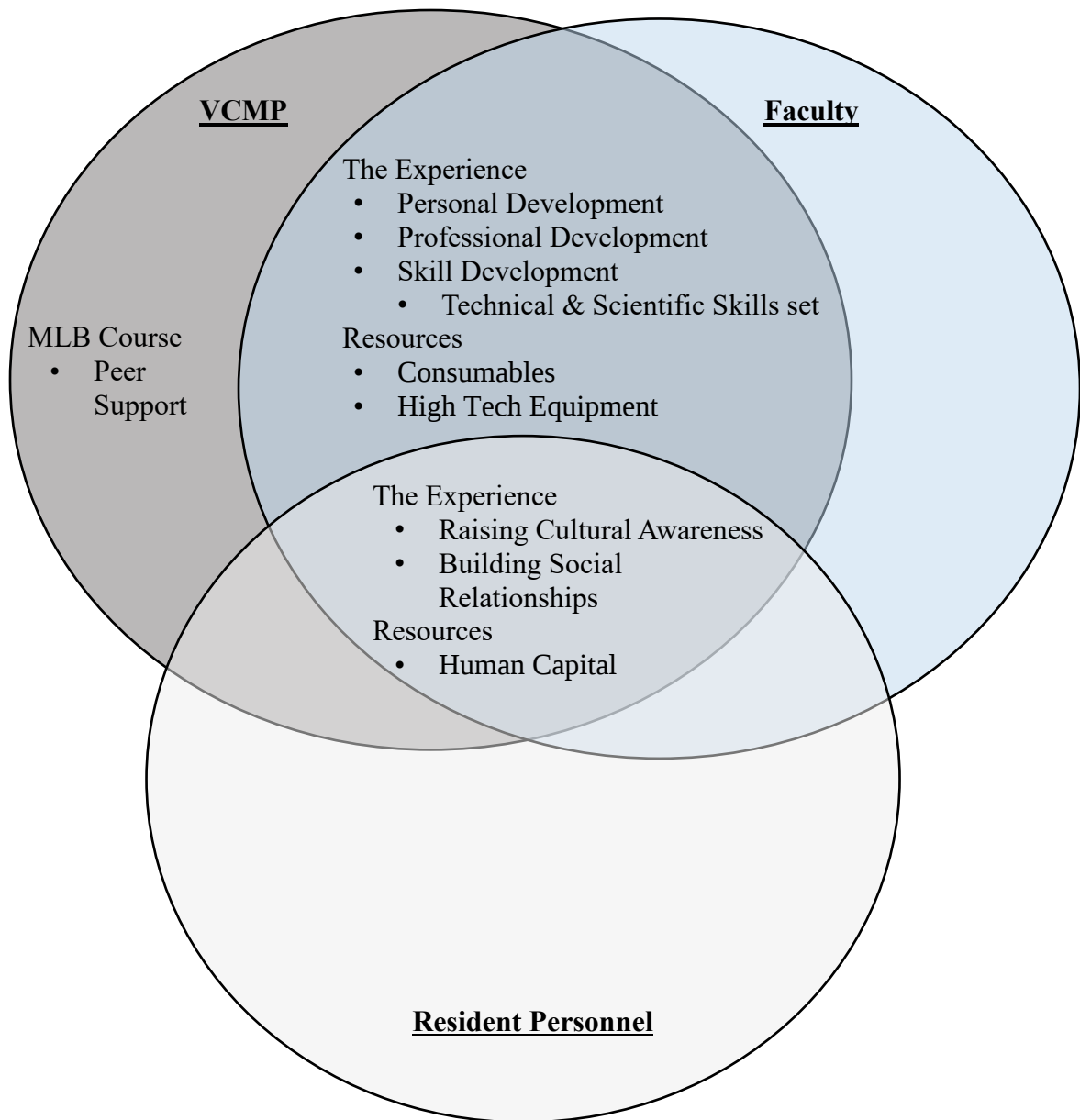


Figure 5 Comparison of Program Strengths by Study Participant Group

Note. The Venn diagram in Figure 5 represents how themes discovered in responses from each study participant group align and differ around program strengths. Notice that Faculty and VCMP themes align under the main themes of Resources and The Experience in the following ways: Personal and Professional Development, Technical and Scientific Skills Development, and Consumable and High-tech Equipment as Resources. Data from Faculty, VCMP, and RP study participant groups align in Raising Cultural Awareness and Building Social Relationships as themes in program strengths. Data from all three study participant groups also all align under the concept of Human Capital as

a Resource. Only the VCMP study participant group identify the MLB course, specifically, Peer Support in the MLB course as a program strength.

4.1.2 Program Weaknesses

The second arm of the SWOB analysis reveals program weaknesses/area for development in this transnational training program. Program weaknesses were identified by asking stakeholders to discuss areas of the program they would like to see developed and using key words related to dissatisfaction. Table L2 in appendix L identifies coding strategies, interview and survey questions, and corresponding study inquiry questions used to assess program weaknesses. The mind maps depicted in Figures 6-8 represent program weaknesses by study participant group. The program weaknesses narrative following the mind maps provides a detailed explanation of main themes and the sub themes. Main themes are boldface and indented. Subthemes supporting each main theme are indented and italicized. Thirteen of 120, or 10.8% of VCMP exit interview survey responses are coded as program weaknesses or areas for development. Program weaknesses represent an overall 28.3% of study participant interview responses.

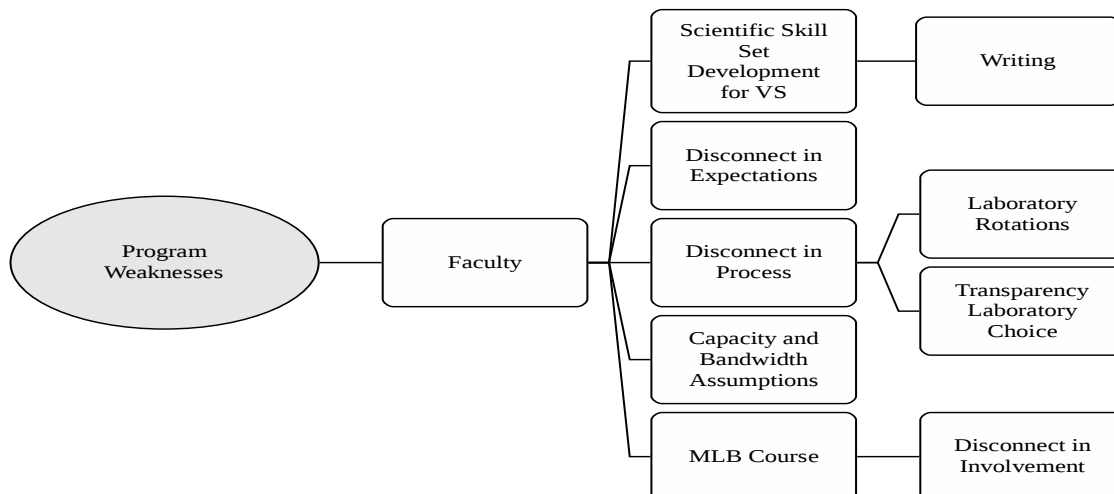


Figure 6 Mind Map Depicting Program Weaknesses as Identified by Faculty Study Participants

Note. Figure 6 is a mind map representing program weaknesses identified from the Faculty study participant group. Four major themes are identified as program weaknesses from Faculty study participant data including: 1. Scientific Skills Set Development of Writing for VCMP, 2. Disconnect in Expectations, 3. Disconnect in Process, Capacity and Bandwidth Assumptions, and 4. Disconnect from involvement in the MLB course. Interpretations that make meaning of similarities and differences between study participant groups of each theme and the identified subthemes are described in the program weaknesses narrative following figures 6-8 mind map visual representations.

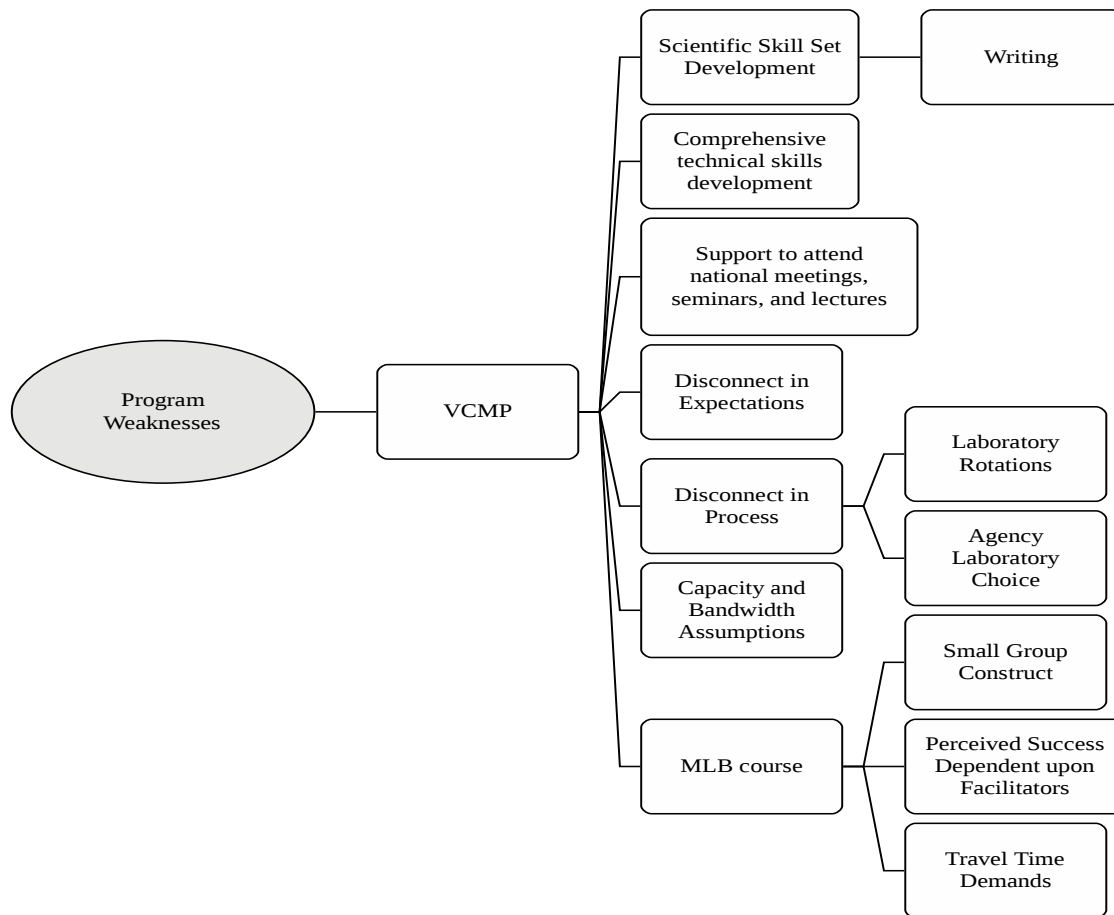


Figure 7 Mind Map Depicting Program Weaknesses as Identified by Visiting Chinese Medical Professional (VCMP) Study Participants

Note. Figure 7 is a mind map representing program weaknesses identified from the VCMP study participant group. Seven major themes are identified as program weaknesses from VCMP study participant data including: 1. Scientific Skills Set Development, 2. Comprehensive Technical Skills Development, 3. Support to attend national meetings, 4. Disconnect in Expectations, 5. Disconnect in Process, 6. Capacity and Bandwidth Assumptions, and 7. Aspects of the MLB course. Interpretations that make meaning of similarities and differences between study participant groups of each theme and the identified subthemes are described in the program weaknesses narrative following figures 6-8 mind map visual representations.

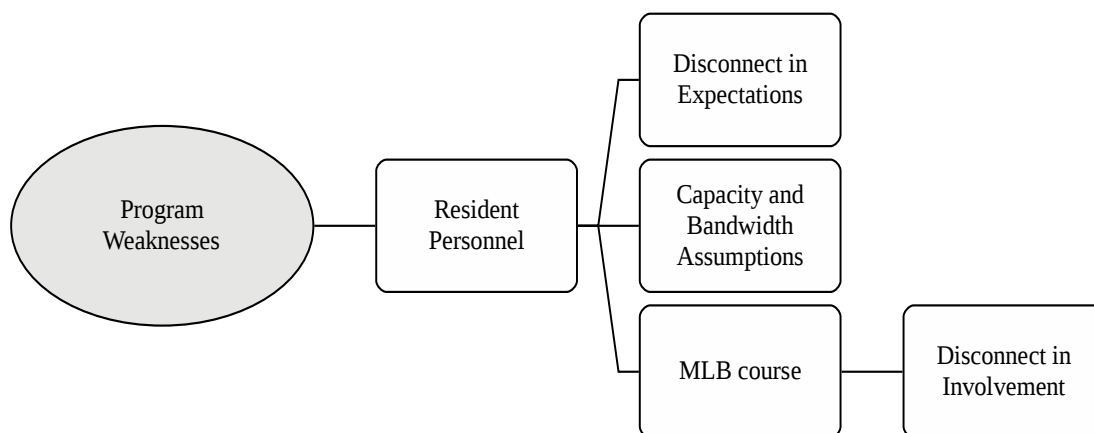


Figure 8 Mind Map Depicting Program Weaknesses as Identified by Resident Personnel (RP) Study Participants

Note. Figure 8 is a mind map representing program weaknesses identified from the RP study participant group. Three major themes are identified as program weaknesses from RP study participant data including: 1. Disconnect in Expectations, 2. Capacity and Bandwidth Assumptions, and 3. Disconnect from involvement in the MLB course. Interpretations that make meaning of similarities and differences between study participant groups of each theme and the identified subthemes are described in the program weaknesses narrative.

4.1.2.1 Program Weaknesses Narrative

4.1.2.1.1 Scientific Skills Set, Writing

Data show both Faculty and VCMP study participants express a need for more skill development in data reporting, specifically mentioning scientific writing process and presentation of data. Four of 13, or 30.8% VCMP responses identify being dissatisfied in their ability to report data, specifically mentioning scientific writing as an area of deficiency. One VCMP stated, "I strongly suggest to set up classes to train visiting scholars in scientific writing. The opportunity to audit certain classes in the university will also be preferred." One hundred percent of Faculty study participants identify scientific writing as an area for development in the VCMP stakeholders' scientific skill set. For example, one Faculty study participant stated, "I found that with this last

Tsinghua scholar because they actually had to write a thesis that we just I think we could have done a lot more with her writing and I don't think we did enough and I think it was just due to the fact I mean we are writing up her manuscripts now because it often takes 2 years to get a good body of data right so we will work on that remotely but it is not the same as when I can see her every day, right.”

Data from RP study participants did not provide information to support or not support this identified program weakness.

4.1.2.1.2 Technical Skills Development

Although skill development is identified as a program strength, it is important to recognize that learning only one or two technical skills is not satisfying to VCMP stakeholders who, “become bored learning only one or two technical skills and repeating that continuously.” Although boredom can be experienced by anyone repeating something continuously, this data demonstrates a potential lack of technical skill development by some VCMP stakeholders and unclear expectations of the reality of biomedical research. Data from VCMP study participant responses suggests technical skill development on a more comprehensive scale for VCMP stakeholders is an area for development in this transnational training program.

Both Faculty and RP data did not identify technical skill development as an area for development. Both of these stakeholder groups were satisfied with the technical skills acquired by VCMP working in their respective laboratories. This signifies a disconnect between levels of satisfaction and expectations among study participant groups.

4.1.2.1.3 Disconnect in Processes

It is clear that the training program leaders have a working model for selecting laboratories with which VCMP are appointed. However, the decision-making process for how VCMP

stakeholders are paired with laboratories is a mystery to study participants in this study. Data from both Faculty and VCMP study participants identify the pairing process as an area for improvement.

4.1.2.1.3.1 Laboratory Rotations

Fifteen-point-four percent of VCMP exit survey responses identify the lab rotation as an area for improvement. Eighty percent of Faculty and 30% of VCMP study participants mention they would like to see a longer laboratory rotations. Each of these study participant groups acknowledges the reasoning for the short rotation period as being a result of the VCMP 2-year time restriction.

4.1.2.1.3.2 Agency and Transparency in Laboratory Choice

Data from the one-on-one interviews reveal that VCMP study participants want more agency in their choice of laboratory. One VCMP stated, “Yeah, I actually I think it would be better if I, if we could have our own options because actually the University of Pittsburgh interviewed us before we came to Pittsburgh and to determine what our interests were and then therefore assigned us three labs for us to rotate and the decision was made by us to decide the final lab we were going to spend the two years in. but I think, um, so, through the lab rotation is still like kind of assigned to us somehow like it is not 100% guess to us...”

Data from Faculty study participants identifies a lack of transparency in how laboratories are chosen. Ninety percent of Faculty study participants identify not knowing if the VCMP they ultimately received chose to be in their laboratory themselves or if this choice was made for the VCMP by someone else.

RP study participants did not mention having any knowledge of the laboratory rotations or pairing process.

4.1.2.1.4 Disconnect in Expectations

Unclear expectations developed as an emerging theme in the coding process and the data show that all three stakeholder groups lack clear understanding of expectations in the transnational training program. Personal experience and study participant responses show roles and outcomes have organically evolved over time. However, there is deficiency in the feedback necessary to clarify expectations of each stakeholder group. Zero of 10 Faculty study participants presume to have a clear understanding of the requirements of the training program collaborative agreement or expectations of VCMP or Faculty stakeholder groups. In fact, 0 of 10 Faculty study participants identify being a part of a training program.

The data show that 0 of 6 RP study participants knew about obligations or set expectations relating to the training program between Tsinghua University School of Life Sciences and the University of Pittsburgh. Outside of knowing that the students were from China, only 1 RP study participant had any knowledge that the training and knowledge sharing they provide relate to a formal transnational collaborative training effort in global health education.

4.1.2.1.5 Support to Attend Lectures, Seminars, and National Meetings

Seven-point-seven percent of VCMP exit interview responses identify attending lectures, seminars, and national meetings as an area for development. VCMP interviews identify dissatisfaction in this area, too. Outside of the annual symposium, in which the VCMP stakeholders participate, the ability of the VCMP to attend lectures, seminars, and national meetings is dependent upon their Faculty mentor and that mentor's resources. While several Faculty study participants identify sending a few of the VCMP to national meetings, this option is entirely dependent upon the Faculty stakeholder and is identified as an area for development.

Data from RP study participants did not provide information to support or not support this identified theme.

4.1.2.1.6 Identifying Capacity and Bandwidth

The data show that identifying capacity and bandwidth are areas for development. The training program, in its current constitution, postulates that each VCMP has the emotional capacity and bandwidth to immerse themselves into both American culture and the University of Pittsburgh's School of Medicine organizational culture. Although not mentioned in the exit survey responses, 100% of VCMP study participants recognized in their one-on-one interviews the difficulties they experience in adapting within this transnational training process. Data from the program strengths section show that a main benefit of the MLB course is peer support. This identification suggests there are insufficient avenues for VCMP stakeholders to acquire support if struggling with adaptability and is identified as an area for development. One Faculty study participant describes, "integration does not always translate in transnational cooperations [*sic*], such as this one. I think it is really tough for some. So, um, my student um, so, we have lab benches and of course we integrated him into our meetings, but I would say he was pretty much he really did not, um you know he stuck pretty close to his colleagues in the program. So, um, I am not sure I would say he was ever really comfortable even after 2 years."

Faculty and RP study participant groups express experiencing a strain in bandwidth when discussing the visiting scholar training process. From my experience and Faculty interview transcriptions, there is an unspoken expectation that RS stakeholders are all equally equipped to share knowledge and effectively train transnational scholars in this program's current constitution. Each RP stakeholder is assumed to have the capacity and bandwidth to effectively share knowledge and train VCMP stakeholders. For example, one RP stated, "I don't know, it is a

challenge. And it is a challenge that I don't want to do though. No really, I like teaching people and I like being able to think of way to get them to understand. I just don't think I am getting anything out of it personally or professionally except frustration.” Since the inception of the program, training visiting scholars was assumed to be part of the RP job description without any curiosity about ability or logistics of what training the VCMP might entail. The intrinsic factors of each stakeholder group are heavily relied upon as a motivating force in the training process.

Faculty study participants found out that existing racism and stereotypes existed in their laboratory, which directly impacts daily laboratory operations. In fact, data from a one-on-one Faculty interview identifies that this assumption can be detrimental. This Faculty study participant discussed how a lack of formal process in being curious with RP stakeholders resulted in conflict in the laboratory community and a resignation by the RP from their position. I had personal experiences with RP stakeholders who exhibited racist behavior, stereotyping, and, on occasion, complete refusal to train the visiting scholars, “because it is not part of their job description.”

Data for the RP study participants reveal clear expectations that knowledge sharing of technical skill development is supposed to just happen. However, there are unclear expectations and directions on how, why, and the degree of knowledge sharing. Quality control checks do not always identify that knowledge sharing has been successful. Some RP were unsure of whether they were doing work for the VCMP or training them on how to complete a task. Identifying a feedback mechanism outside of productivity, where productivity is defined as a journal publication could be helpful and will be discussed in section 5.

4.1.2.1.7 Cultural Awareness

Faculty members maintain that they accept the Tsinghua visiting scholars into their labs and treat them just as they would any other graduate student or person coming into the lab.

Although this sentiment carries tones of equality and equity, this perspective actually exacerbates “colorblindness” and leaves room for intentional and unintentional microaggressions and stereotyping. Data from the VCMP did not contribute to this section directly. Data from Faculty study participants shows how VCMP tend to gravitate toward their peer group and sometimes have difficulty integrating. Data from RP study participants shows variability in cultural awareness. Some RP study participants are able to communicate and demonstrate cultural awareness and other RP are not culturally aware. This data aligns with data from the section discussing disconnect in expectations reinforcing the necessity for development in cultural awareness, diversity, and inclusion.

4.1.2.1.8 Methods and Logic in Biomedicine Course (MLB).

Four of 13, or 30.8% of VCMP exit survey responses identify 3 aspects of the MLB course as areas for development. Data from the VCMP interviews directly supports the exit survey findings.

One area for development is the construct of small groups. Having small groups comprised of VCMP immersed in diverse research fields makes it difficult for peer feedback and peer assisted troubleshooting.

The second area for development is the variability in the knowledge sharing in the course. Data from both one-on-one interviews and exit surveys show that the perceived successfulness and benefit of the MLB course is dependent upon the facilitator.

The third area for development in the MLB course is the amount of time required to get to and from the course. Several VCMP mentioned how difficult and time consuming it is to take the bus from their research facility to the facility the courses are being held. The VCMP did not like that they had to sacrifice almost an entire day of research time to go to the MLB classes. One

VCMP stated, “if we can do this online it would be much easier for us to um, come we stop whatever we are doing to attend the course because I find it very hard to get on the course on time. Because that is part of my problem because the 71B has traffic it is terrible it is terrible.”

Faculty and Resident Personnel stakeholders expressed limited to no knowledge of the MLB course curriculum or obligations associated with the MLB course. This disconnect is identified as an area for development. For example, one Faculty study participant stated, “As PI’s as Mentors, even though we are the guys who spend the most time with these guys there is no, at least I don’t have any knowledge, and I definitely don’t have any involvement in the curriculum outside of the class you just mentioned which, yes, I do know of but that is just because of a student telling me, um I can’t answer the question because I don’t know what they have already and um, there is nothing blindingly obvious that I see in them that is lacking that isn’t being accommodated to or catered for.”

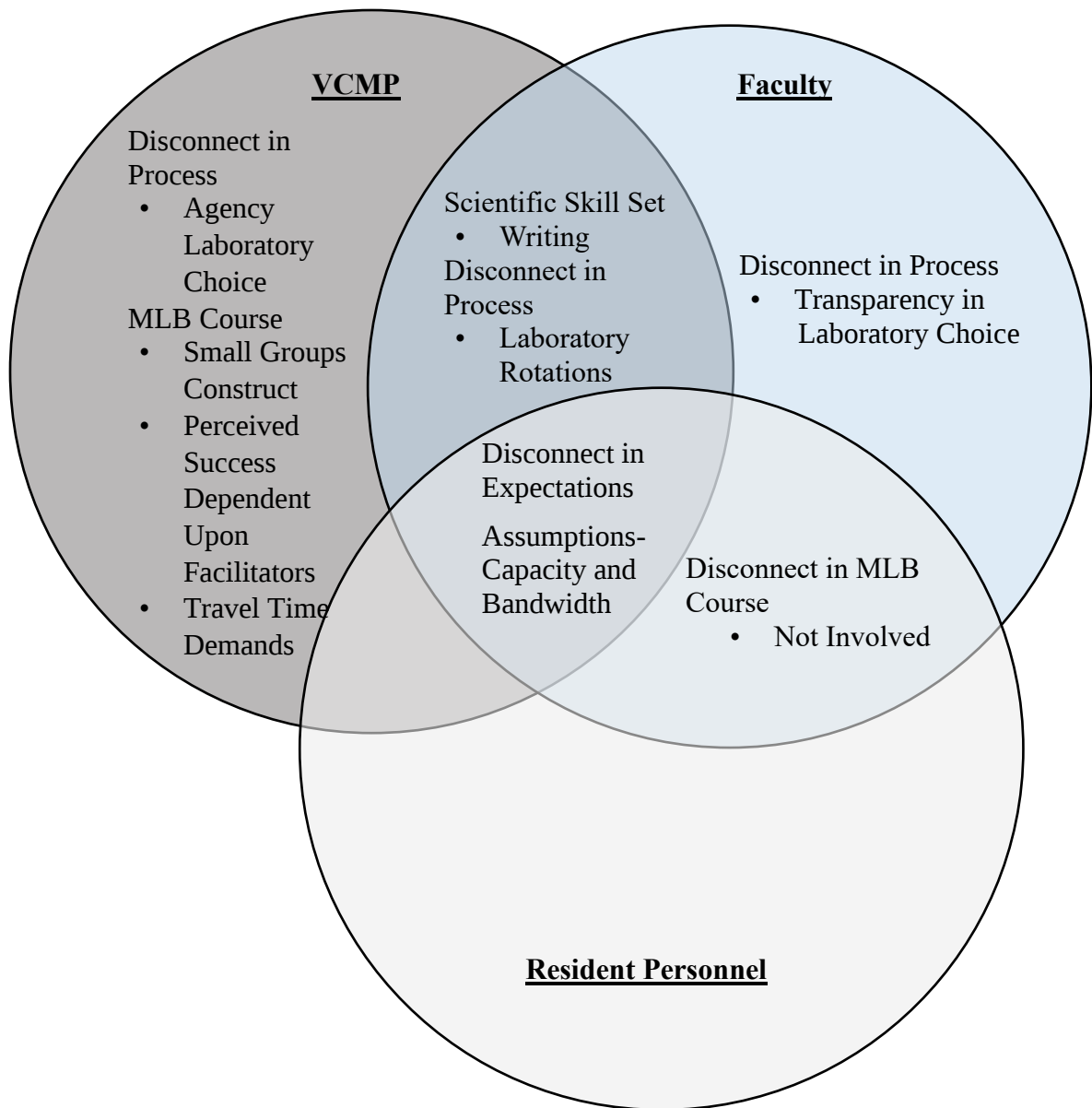


Figure 9 Comparison of Program Opportunities by Study Participant Group

Note. The Venn diagram in Figure 9 represents how themes discovered in responses from each study participant group align and differ around program weaknesses. Notice that all three study participant groups identify disconnect in expectations and assumptions of capacity and bandwidth as themes in program weaknesses. Faculty and VCMP align in identifying the scientific skill set of writing and disconnect in laboratory rotation process. Data from Faculty and RP align in the theme of disconnect in the MLB course. Only Faculty study participants identify disconnect in transparency of laboratory choice as a program weakness. Only the VCMP study participant group identify aspects of the MLB course as program weaknesses, specifically, the construct of the small groups, perceived success being

facilitator dependent, and travel time demands peer support in the MLB course as a program strength. Only the VCMP identify the disconnect in process of lacking agency in laboratory choice as a program weakness.

4.1.3 Program Opportunities

The third arm of the SWOB analysis reveals program opportunities in this transnational training program. Asking stakeholders to discuss areas of the program from which they could benefit and using key words related to opportunity facilitate the identification of program opportunities in this transnational training program. Table L3 in appendix L identifies coding strategies, interview and survey questions, and corresponding study inquiry questions used to assess program opportunities. The mind maps depicted in Figures 10-12 represent program opportunities by study participant group. The program opportunities narrative following the mind maps provides a detailed explanation of main themes and the sub themes. Main themes are boldface and indented. Subthemes supporting each main theme are indented and italicized. Six of 120, or 5% of VCMP exit interview survey responses are identified as program opportunities. Program opportunities represent an overall 15% of study participant interview responses.

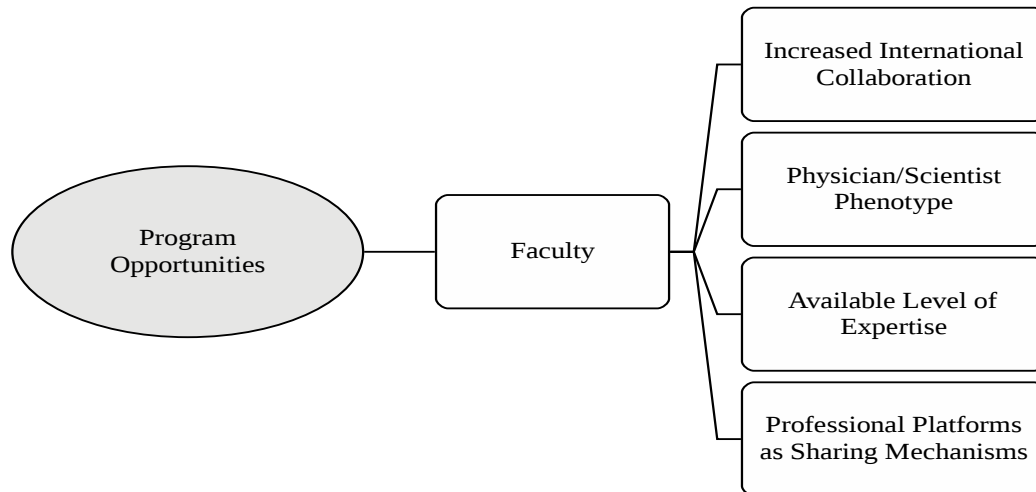


Figure 10 Mind Map Depicting Program Opportunities as Identified by Faculty Study Participants

Note. Figure 10 is a mind map representing program opportunities identified from the Faculty study participant group. Four major themes are identified as program opportunities in this transnational training program from Faculty data including: 1. Increased International Collaboration, 2. Physician/Scientist Phenotype, 3. Available Level of Expertise, and 4. Professional Platforms as Sharing Mechanisms. Interpretations that make meaning of similarities and differences between study participant groups of each theme and the identified subthemes are described in the program opportunities narrative following figures 10-12 mind map visual representations.

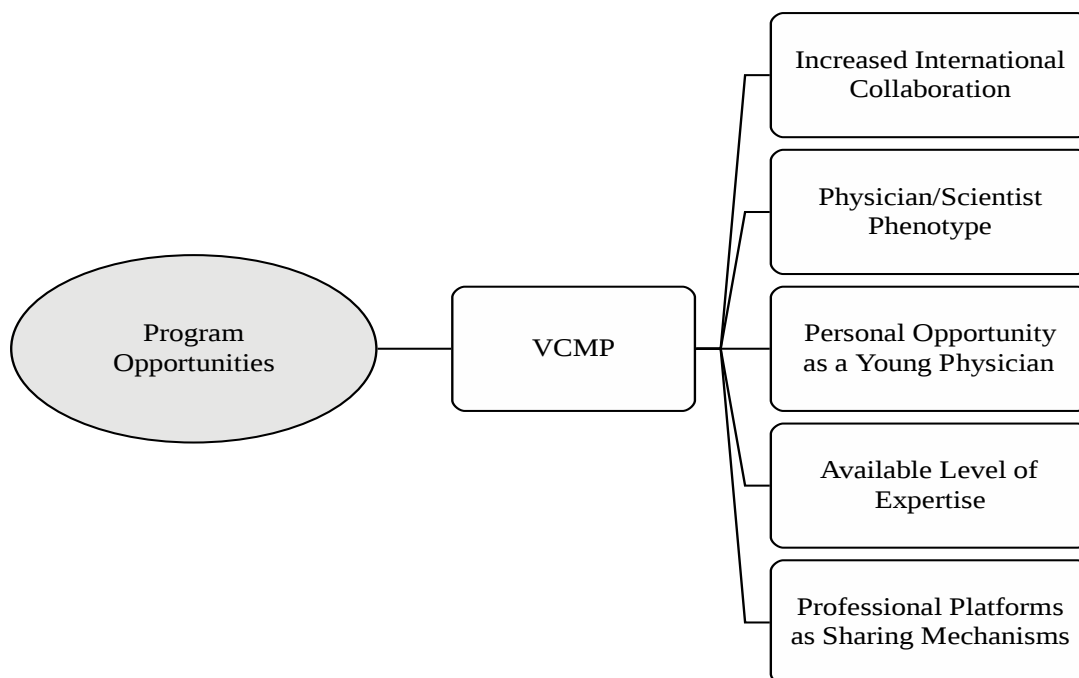


Figure 11 Mind Map Depicting Program Opportunities as Identified by Visiting Chinese Medical Professional (VCMP) Study Participants

Note. Figure 11 is a mind map representing program opportunities identified from the VCMP study participant group. Five major themes are identified as program opportunities from VCMP data including: 1. Increased International Collaboration, 2. Physician/Scientist Phenotype, 3. Personal Opportunity as a Young Physician, 4. Available Level of Expertise, and 5. Professional Platforms as Sharing Mechanisms. Interpretations that make meaning of similarities and differences between study participant groups of each theme and the identified subthemes are described in the program opportunities narrative following figures 10-12 mind map visual representations.

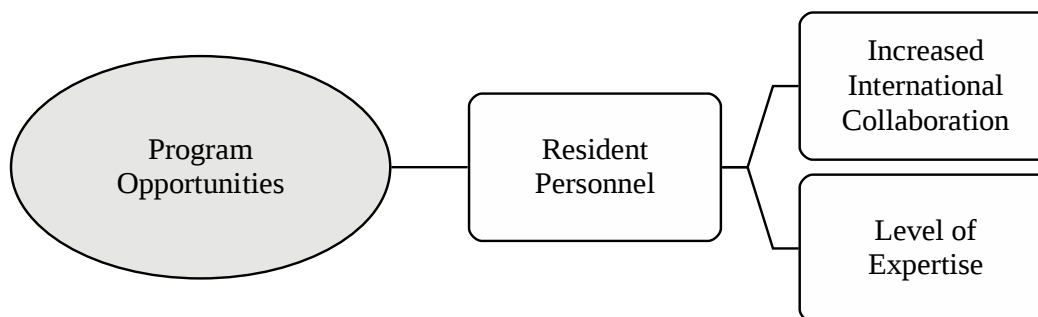


Figure 12 Mind Map Depicting Program Opportunities as Identified by Resident Personnel (RP) Study Participants

Note. Figure 12 is a mind map representing program opportunities identified from the RP study participant group. Two major themes are identified as program opportunities from RP data including: 1. Increased International Collaboration and 2. Available Level of Expertise. Interpretations that make meaning of similarities and differences between study participant groups of each theme and the identified subthemes are described in the program opportunities narrative.

4.1.3.1 Program Opportunities Narrative

4.1.3.1.1 The Program

VCMP study participant responses to the exit survey questions and interviews identify opportunities presented from this training program in the United States that are not comparable to that in China. These opportunities include: scientific expertise, personal opportunity as a young physician, professional platforms as sharing mechanisms, and the existence of the career path of a physician/scientist.

4.1.3.1.1.1 Increased International Collaboration

For the past 11 years, China has ranked #1 as the country of origin for international students at the University of Pittsburgh (www.iie.org/opendoors). Data from all three stakeholder groups identify that this biomedical research training program provides an opportunity for increased

international collaboration. One Faculty study participant stated, “I think it sets up a conduit to, although, whether it develops in the future, it sets up a conduit to the Chinese institution. Through an individual, or in this case three individuals. Again, you never know where these things are going to lead. Because they work for professors over there, and that may lead to increased international collaboration.”

4.1.3.1.1.2 Level of Expertise

When asked why the VCMP chose the University of Pittsburgh, VCMP study participants recognize the opportunity to train with people who poses a high level of expertise in the US. The VCMP study participants consider the level of expertise at the University of Pittsburgh higher level than the alternatives, specifically recognizing immunology, cancer research, and computational biology. For example, the opportunity for advanced inquiry of computational biology and epidemiology is presented by one VCMP study participant who recognizes the potential posed by proper analysis of information acquired from datasets generated in China. One of 5 VCMP interviews and 16.7% of VCMP exit survey data show the opportunity of exploring big data sets from patient populations in China is a viable option for the VCMP returning to China. Data from the program strengths results section show how knowledge sharing practices in experimental design and scientific skills development provided in this training program supports an opportunity for advancing research rigor and reproducibility as the VCMP approach analysis of these big data sets upon returning to China.

Data from Faculty and RP study participants supports the VCMP findings that level of expertise offered at this institution provides an opportunity to the VCMP.

4.1.3.1.1.3 Personal Opportunity as a Young Physician

VCMP study participants recognize participation in this transnational biomedical research training program as a unique opportunity. They specifically identified this possibility of conducting basic science research as a medical student and obtaining a Master's Degree as special and something that will set them apart from their peers in China. VCMP study participants identify the opportunity for ownership of a project from the onset of joining a laboratory and being encouraged to have autonomy and agency in conducting experiments and experimental design as an opportunity unique to this transnational training experience. Faculty study participants design their mentoring to support this type of knowledge sharing and independent development.

Currently, the training program offers an opportunity to obtain a PhD to interested and qualified VCMP, which also contributes to the personal opportunity of the young Chinese physicians. 2 Faculty study participants recognize the VCMP opportunity to obtain a PhD degree. These Faculty study participants also recognize that this opportunity extends the VCMP time here and may present inequity between this opportunity and existing PhD student requirements.

Data from RP study participants did not provide information to support or not support this identified theme.

4.1.3.1.1.4 Professional Platforms as Sharing Mechanisms

Thirty-three percent VCMP exit survey responses recognize the opportunity of professional platforms as a sharing mechanisms. Data from VCMP and Faculty study participants confirm professional meetings, seminars, lectures, and professional guest lectures as an opportunity that is more available in the United States compared to China or other partnering institutions in other countries. Although attending national meetings is identified as an area for development in the program weaknesses section, this is due to the potential inequity and variability

of this opportunity. The opportunity to attend and present at national meetings and local seminars functions to both assist the VCMP stakeholders with networking and data reporting skills development and to promote the University of Pittsburgh for its role in global health education collaborations.

Data from RP study participants did not provide information to support or not support this identified theme.

4.1.3.1.1.5 The Physician/Scientist Phenotype

Data from both VCMP exit surveys and interviews shows the phenotype of physician/scientist is not customary in China. One VCMP study participant stated, “I believe the connection between hospitals and basic research is more close [*sic*] in the American model. There were not many physicians in China that can manage to handle clinic work and research at the same time due to the medical system under the current environment.”

Data from Faculty study participant interviews recognize the paucity of the physician/scientist phenotype in China. One Faculty study participant stated, “I think they come in and they are very eager, they are willing to work hard and they want to get stuff done, but what I have noticed is this sort of evolution of them becoming a scientist.”

Data from RP study participants did not provide information to support or not support this identified theme.

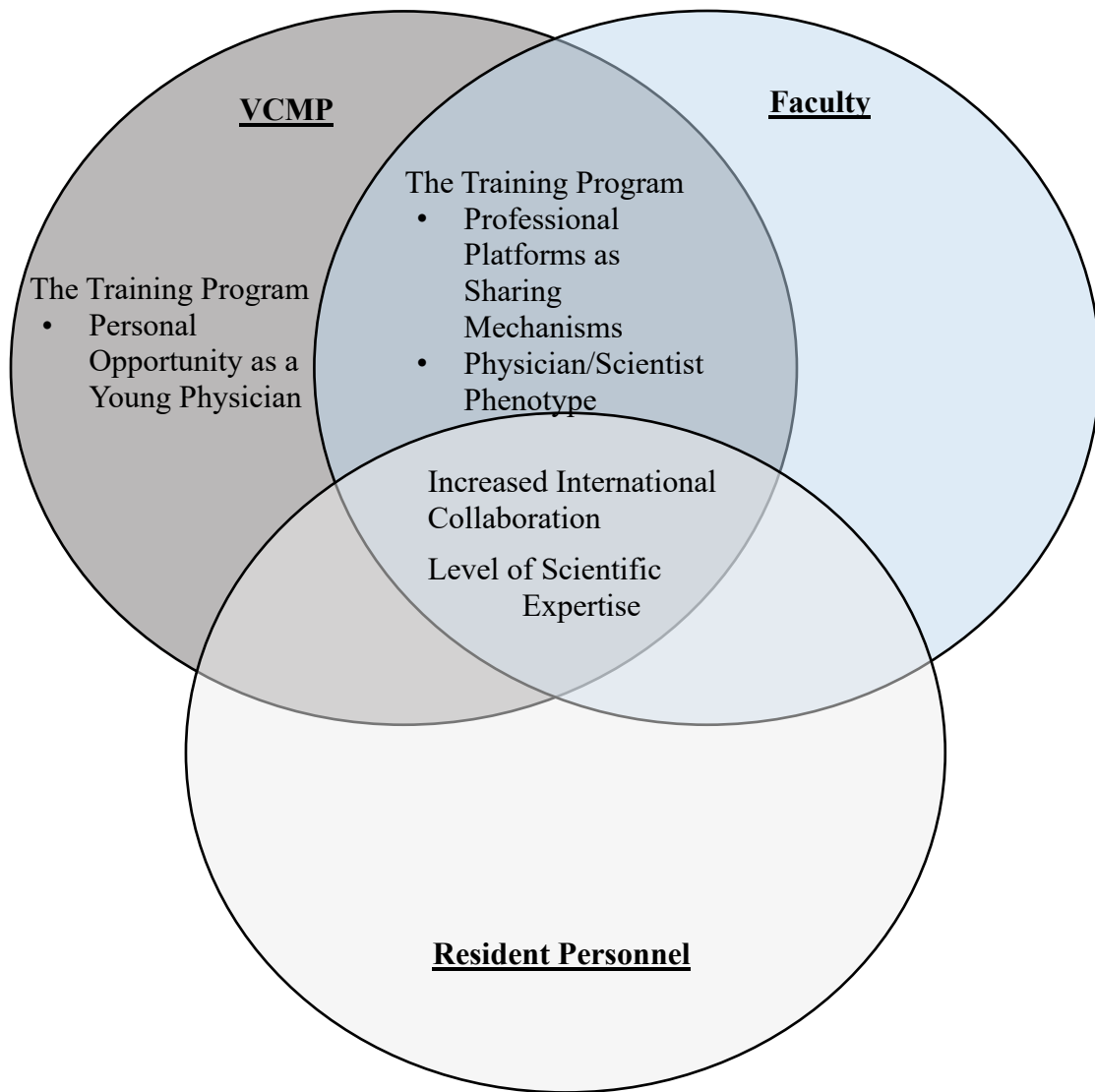


Figure 13 Comparison of Program Opportunities by Study Participant Group

Note. The Venn diagram in Figure 13 represents how themes discovered in responses from each study participant group align and differ around program opportunities. Notice that all three study participant groups align in the identification of International Collaboration and Level of Scientific Expertise as themes in program opportunities. Faculty and VCMP align in the theme of The Training Program, specifically, Professional platforms as Sharing Mechanisms and the Physician/Scientist Phenotype. Only the VCMP study participant group identify Personal Opportunity as a Young Physician as a program opportunity.

4.1.4 Program Barriers

Finally, the fourth arm of the SWOB analysis identifies program barriers. Although mostly thought of as external forces that may adversely affect the success of a company or operation, these findings discuss both internal and external barriers that exist in this transnational training program. Exposing existing internal and external barriers to success can help stakeholders develop strategies to overcome them. Table L4 in appendix L identifies coding strategies, interview and survey questions, and corresponding study inquiry questions used to assess program opportunities. The mind maps depicted in Figures 13-15 represent program opportunities by study participant group. The program barriers narrative following the mind maps provides a detailed explanation of main themes and the sub themes. Main themes are boldface and indented. Subthemes supporting each main theme are indented and italicized. Thirty of 120, or 25% of VCMP exit interview survey responses are identified as program barriers. Program barriers represent an overall 18.5% of study participant interview responses.

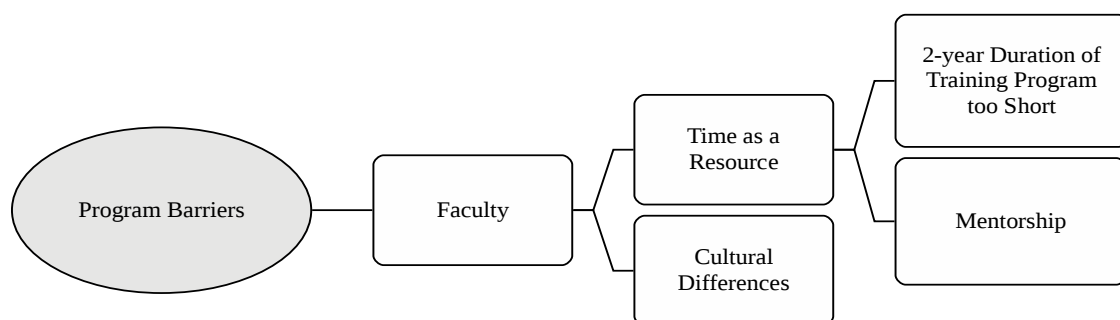


Figure 14 Mind Map Depicting Program Barriers as Identified by Faculty Study Participants

Note. Figure 14 is a mind map representing program barriers identified from the Faculty study participant group. Two major themes are identified as program barriers from Faculty data including: 1. Time as a Resource and 2. Cultural Differences. Interpretations that make meaning of similarities and differences between study participant groups of

each theme and the identified subthemes are described in the program barriers narrative following figures 15-17 mind map visual representations.

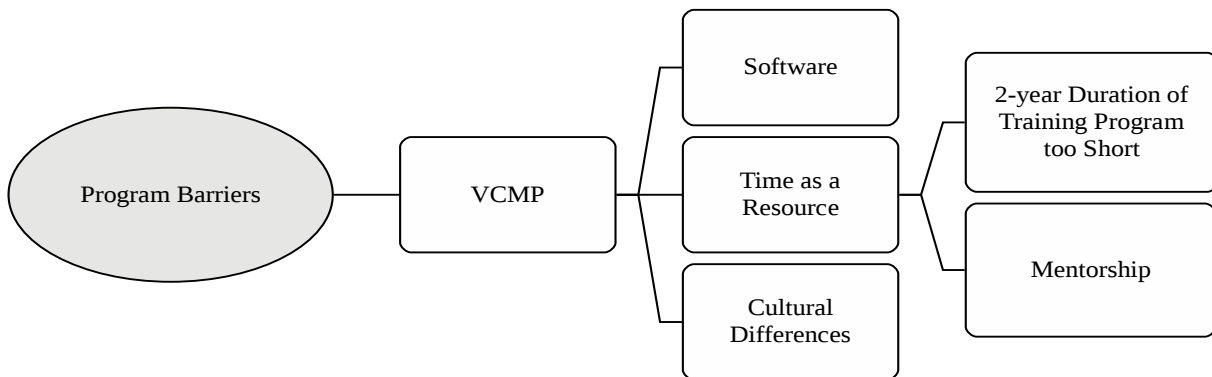


Figure 15 Mind Map Depicting Program Barriers as Identified by Visiting Chinese Medical Professional Study Participants

Note. Figure 15 is a mind map representing program barriers identified from the VCMP study participant group. Three major themes are identified as program barriers from VCMP data including: 1. Availability of Software, 2. Time as Resource, and 3. Cultural Differences. Interpretations that make meaning of similarities and differences between study participant groups of each theme and the identified subthemes are described in the program barriers narrative following figures 15-17 mind map visual representations.

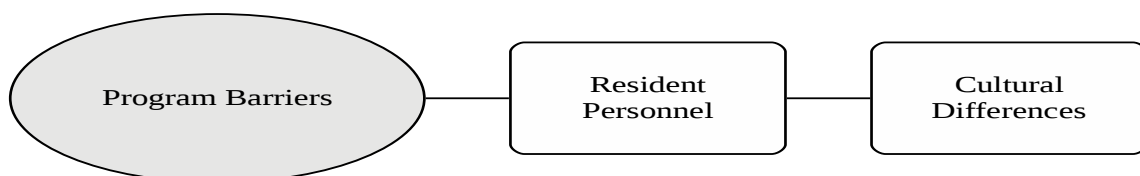


Figure 16 Mind Map Depicting Program Barriers as Identified by Resident Personnel (RP) Study Participants

Note. Figure 16 is a mind map representing program barriers identified from the RP study participant group. From analyzing the RP data, only Cultural Differences is identified as program barrier in this transnational training program. Interpretations that make meaning of similarities and differences between study participant groups of each theme and the identified subthemes are described in the program barriers narrative.

4.1.4.1 Program Barriers Narrative

4.1.4.1.1 Time as a Resource

Time as a resource is a recurring theme throughout this study. VCMP exit survey data and interview data from each of the study participant groups use language that pertain to time constraints and/or time demands. Time as a resource barriers identified in this study focus on mentorship and overall length of time at the University of Pittsburgh to accomplish goals, such as attaining high impact journal publications.

4.1.4.1.1.1 Time as a Resource, Length of Research Time in America

Three of 28, or 10.7% of VCMP exit survey responses identify length of time at the University of Pittsburgh as a barrier preventing goal attainment. Faculty study participants identify the 2-year timeframe in the lab as a potential barrier to conduct proper experiments and obtain high impact publications.

Data from RP study participants did not provide information to support or not support this identified theme.

4.1.4.1.1.2 Time as a Resource, Mentorship

The data show 100% of VCMP study participants desire direct communication with the primary investigator (PI)/mentor. Disconnect in the availability of direct communication with mentors was mentioned in 14.3% of VCMP exit interview survey responses. Although some VCMP identify their mentor experience as satisfactory, the data show time constraints on mentors as a barrier in this program. For example, one VCMP stated, “I think um, a common problem for many of us is sometimes we don’t have enough communication with our boss because our boss is so busy.” It is common practice for primary investigators to utilize post docs and assistant faculty in training settings. A system dynamic of this type provides mentoring experience to post docs and

assistant/associate faculty members. The data show that Faculty treat the VCMP just like any other graduate student. Therefore, the current system promotes facilitating faculty development and uses VCMP, graduate students, medical residents in their research years, and undergraduates to accomplish this training experience. Development in this case prevents VCMP from the close contact with their mentors that they desire.

Data from RP study participants did not provide information to support or not support this identified theme.

One-on-one interview responses from VCMP study participant state, “Um, that um, just based on my experience and sometimes I think having discussed this with my peer students, I think um, a common problem for many of us is sometimes we don’t have enough communication with our boss because our boss is so busy. So, I am not sure if it, um, so, I think that it would be good to push us or like help us to make it more, um often or like that we can chat with our boss about our projects that would be good, yeah.” Another VCMP study participant stated, “So, I am not sure if it, um, so, I think that it would be good to push us or like help us to make it more, um, often or like, that we can chat with our boss about our projects, that would be good.”

4.1.4.1.2 Software Access

Access to software on personal computers is identified as a program barrier. Two of 15, or 13% of VCMP exit survey responses identify access to software as a barrier in the program. Comments such as, "We had a hard time accessing Pitt software while some of them are required during research practice;" and "As visiting scholars we did not get access to some library resources such as Box, Microsoft Office, and Prism. But the lab project often requires these softwares [*sic*]. For me, luckily, my lab provided me with a lab computer that had pre-installed some of these softwares [*sic*]. It would be great if the future scholars can have access to them."

Faculty and RP study participants did not mention software issues at all.

4.1.4.1.3 Cultural Differences as a Barrier

Data from VCMP and RP study participants identify communication and culture as a program barrier. One VCMP study participant stated, “collaboration and communication easier [sic] in Chinese labs.” This VCMP response reflects real struggles this individual faced during the training process. This struggle may be a result of language barriers and/or cultural differences. One RP stated, “I mean it is very difficult to communicate with some of them. I have seen well I have learned from you to write things down. (A) yes, that helps (B) but there is no way to truly know if they understand what you are saying to them.”

Data from Faculty study participant interviews supports cultural differences as a barrier. One Faculty stakeholder stated, “I think that the other part of this cultural barrier is that they are just very polite all the time, the students that come over and they are very respectful. Um, and so, it took a long time for me to like get my students to say what they were thinking.” The following separate conversations from different RP focus groups illustrates the difficulty that cultural difference present: 1A: “I have mean to talk about this before the start of the program and you know ah sometimes they just say yes, that is ok, ah that is no problem and they do not want to reject if you want to give a clinical test to her and before that she just say uh yes, before that she may be able to finish a task. However, times proves that it is hard for a student to get into a completely new area.” 1B: “Yeah, and another things is because I think of cultural difference. In the beginning they are too shy to say anything so they just say yes.” 2A: “Yeah because they like to nod and say yes a lot, um.” 2B: “I mean that is hard, it is very hard on someone who is training them and hard on someone who is trying to learn because you don’t feel accomplished if that look in their eyes is, yeah, they have no idea what I am talking about.”

It is not customary in Chinese laboratories for VCMP to ask for help. This custom can be misunderstood and interpreted negatively resulting in “othering” of Visiting Scholars. Not asking for help by the Chinese VCMP is a direct observation made by RP study participants during a focus group interview session. The RP stated, “I think that they would rather just figure it out by themselves than ask for help.” This RP study participant proceeded to speculate, “. . . because they might not understand our assistance. But if they are able to work on their own and produce data to present at a lab meeting then I think that is successful for them, but I don’t know it is from us contributing our knowledge to them.” Another perception uncovered during a Resident Personnel stakeholder interview stated, “some people are just stubborn and want to do it themselves...” These uncertainties can be overcome with cultural training.

4.1.4.1.4 Program Sustainability

Program sustainability should be considered. As this program and other comparable programs continue, more and more VCMP are trained. This potentially diminishes a need for transnational biomedical research training systems as they currently exist. VCMP stated, “I say by sending us here and also to Australia, by coming here we are able to use the methodology of science so that when we come back to China, we can spread the knowledge we learned here and also keep that methodology in mind so that we can practice our own studies in China.” One Faculty study participant mentioned the impact of training VCMP and how it might have a finite timeline directly in our interview.

4.1.4.1.4.1 Political Influence

Political influence directly impacts this training program. The political climate of the United States was influenced during the past presidential term. For example, immigration policies

and availability of J-1 Visas impact the ability of the visiting scholars to study in the US. This had an impact on this program.

4.1.4.1.4.2 Hate Crimes

Current social trends in the United States may negatively impact Asian students desire to attend US institutions. There was tension within the Asian American community in the context of political events. Anti-Asian hate crimes rose 73% in the US in 2020 from 161 in 2019 to 279 in 2020 (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7790522> ; <http://www.nbcnews.com/news/asian-america>). One VCMP stated when asked if they were involved in any community groups or organizations during their time here, “I actually was like looking for community [sic] but I did not feel like really safe to go out when I first got here.”

4.1.4.1.4.3 Global Pandemic

One hundred percent relevant to the foundation of this transnational biomedical training program and global health education as practice was the global pandemic associated with SARS-CoV-2, COVID-19. This global pandemic had social and political associations that may have been overlooked in the program. Unexpected health concerns directly impacted this transnational training program. The global pandemic placed a participation barrier on the VCMP. Global travel restrictions prevented VCMP from starting their transnational training and leaving to go back to China to continuing their medical education.

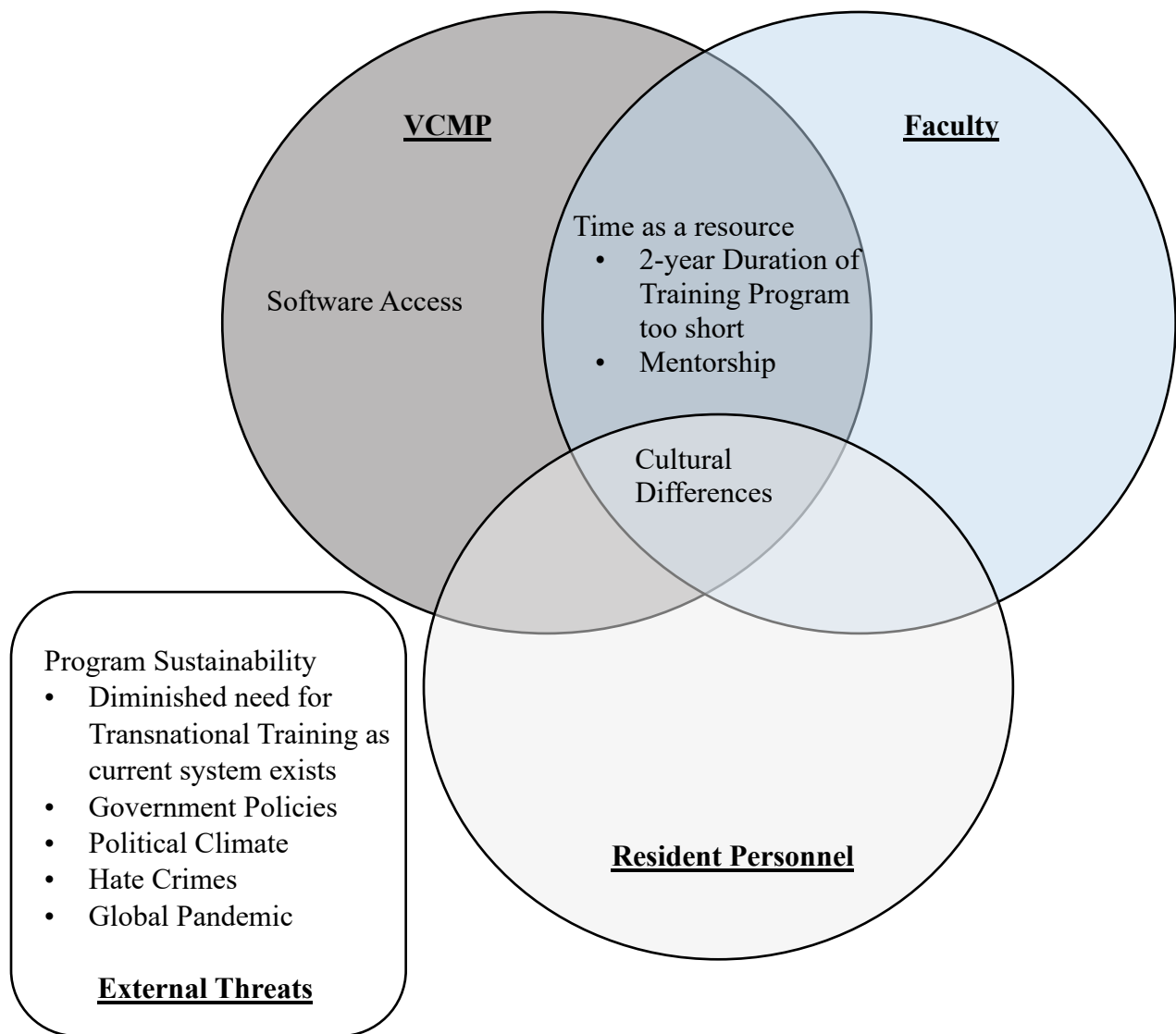


Figure 17 Comparison of Program Barriers by Study Participant Group

Note. The Venn diagram in Figure 17 represents how themes discovered in responses from each study participant group align and differ around external and internal program barriers. Internal threats to the program are identified in the Venn diagram. External threats to the program are identified in the floating shape next to the Venn diagram. Notice that all three study participant groups identify Cultural Differences as an internal threat. Both Faculty and VCMP identify Mentorship and the 2-year Duration of the VCMP Training as program barriers. Only VCMP identify Software access as a program barrier in this training program.

4.2 Stakeholder Goals

Defining study participant goals/objectives is specific to the 1st aim of this study.

Table L5 in appendix L identifies coding strategies, interview and survey questions, and corresponding study inquiry questions used to assess study participant goals. Table 3 shows goals identified by each study participant group and goals of the MLB course. It is worth mentioning that 13.3% of VCMP identify unclear goals and/or failing to accomplish goals in their exit survey responses.

Table 3 Training Program Goals/Objectives by Study Participant Group and MLB Curriculum

Goals / Objectives	Stakeholder Group			
	VCMP ^a	Resident Personnel	Faculty	MLB
Develop Scientific Skill Set Inclusive of:				
Critical Thinking skills	√		√	√
Scientific Question Design	√		√	√
Master the Scientific Method	√		√	√
Data Reporting Skills	√			
(Data Interpretation, Writing, Presentations) ^b			√	√
Literature Review Skills	√		√	√
Develop English Language Skills	√	*	*	√
Develop Critical Appraisal of a Topic (CAT) ^c				√
Develop Technical Skills	√	√	√	
Learn the Culture of Science		*	*	√
Support Research Ethics and Integrity		*	√	√
Finish Thesis	√	*	*	√
Generate Data	√	*	√	*
Develop Understanding of Research Rigor and Transparency		*	√	√
Develop Collaboration Network among Researchers	√		*	*
Gain Understanding of the Life of Physician Scientist	√		√	√
Personal Independence	√			
Develop Research Independence	√		√	√
Develop Knowledge of Lab Operations	√	√		
Promote a Positive Experience			√	√
Develop a Young Scientist		*	√	*
High Impact Journal Publication	√			

Note. Table 3 summarizes goals/objectives identified from data for each study participant group and the MLB course.

^a The VCMP column in Table 3 combines data from both exit survey responses and interviews. ^b Represents understanding how to prepare data for publication and both visual and oral presentations. ^c CAT=guidelines for VCMP to follow to give and receive written and oral critique of peers' presentations.

*Represents an indirect outcome of the stakeholder's involvement as opposed to an outlined goal or objective

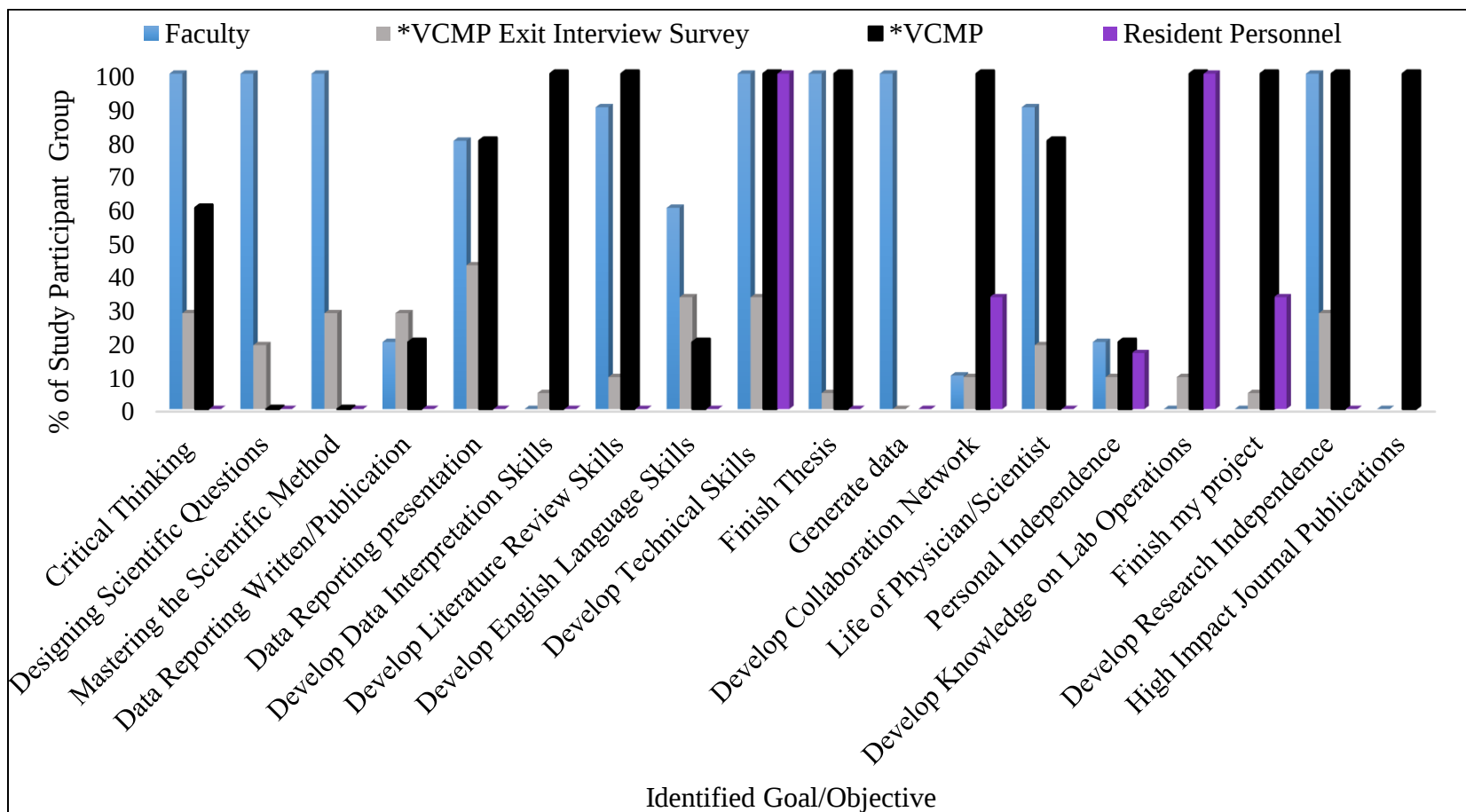


Figure 18 Stakeholder Goals for Transnational Training in Biomedical Research Represented as a Percentage per Study Participant Group

Note. Figure 18 is a visual representation of stakeholder goals based on the percentage of each study participant group who identify the goal/objective as important to them. Notice how RP are only represented in technical skill development themes. Also notice areas of disconnect in identified goals between study participant groups.

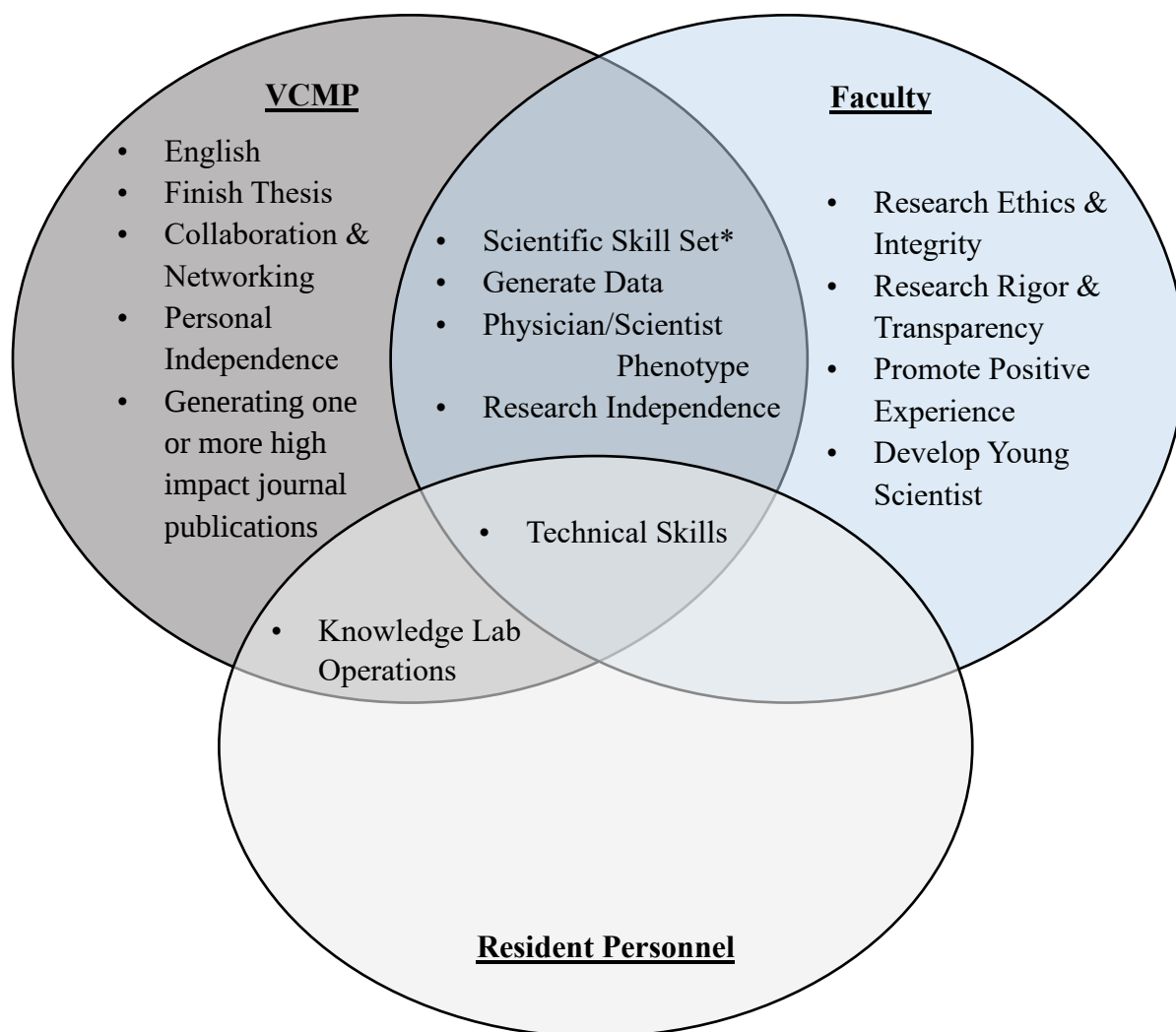


Figure 19 Comparison of Program Goals by Study Participant Group

Note. Figure 19 is a Venn diagram representing how stakeholder goals/objectives align. All three study participant groups identify Technical Skill development as a goal. Faculty goals encompass concepts necessary to Develop a Young Scientist and Generating Data. Faculty and VCMP study participant goals align around developing Independence, Scientific Skills Set, and understanding the Physician/Scientist Phenotype. RP and VCMP goals align around understanding knowledge of general Lab Operations. VCMP scholar goals focus on Personal growth and development, Professional growth through publications, and completing their program's thesis requirement.

*Scientific Skills Set is defined the development of: critical thinking skills, designing scientific questions, mastering the scientific method, and data reporting.

4.2.1 Productivity as a Goal

In addition to the identification of stakeholder goals, I wanted to know how participants in each group define productivity. This inquiry is part of the 2nd aim of this research study. I asked each study participant how they define productivity. Faculty and VCMP study participant responses center around effort and generation of data. For example, one VCMP stated, “I think it like how much valuableness you can produce in a certain amount of time, ahh, but its ahh, it’s very tricky because sometimes what you think will be valuable turns out to be nothing it happens a lot in the research, so, um, I think for me to have productivity is to keep on trying.” One Faculty study participant stated, If you say productivity is producing data then that is dependent upon your models working and your capacity to do many experiments and models are notoriously fickle and they don’t work all the time and ah the data they produce is absolutely dependent upon the model you are using some models like cell culture models that are valuable and produce mass amounts of information very quickly and other models like mouse models produce data really slowly. I can’t use the measure of productivity as data so what am I left with is effort.”

Data from RP centers solely around effort. One RP focus conversations stated, “B) I think productivity is being able to wear a lot of different hats like for example like I have a technician role I have an administrator role I have (A) Do you know how many things I do?”

The concept maps in Figures 20-22 show how each group of study participants perceives productivity.

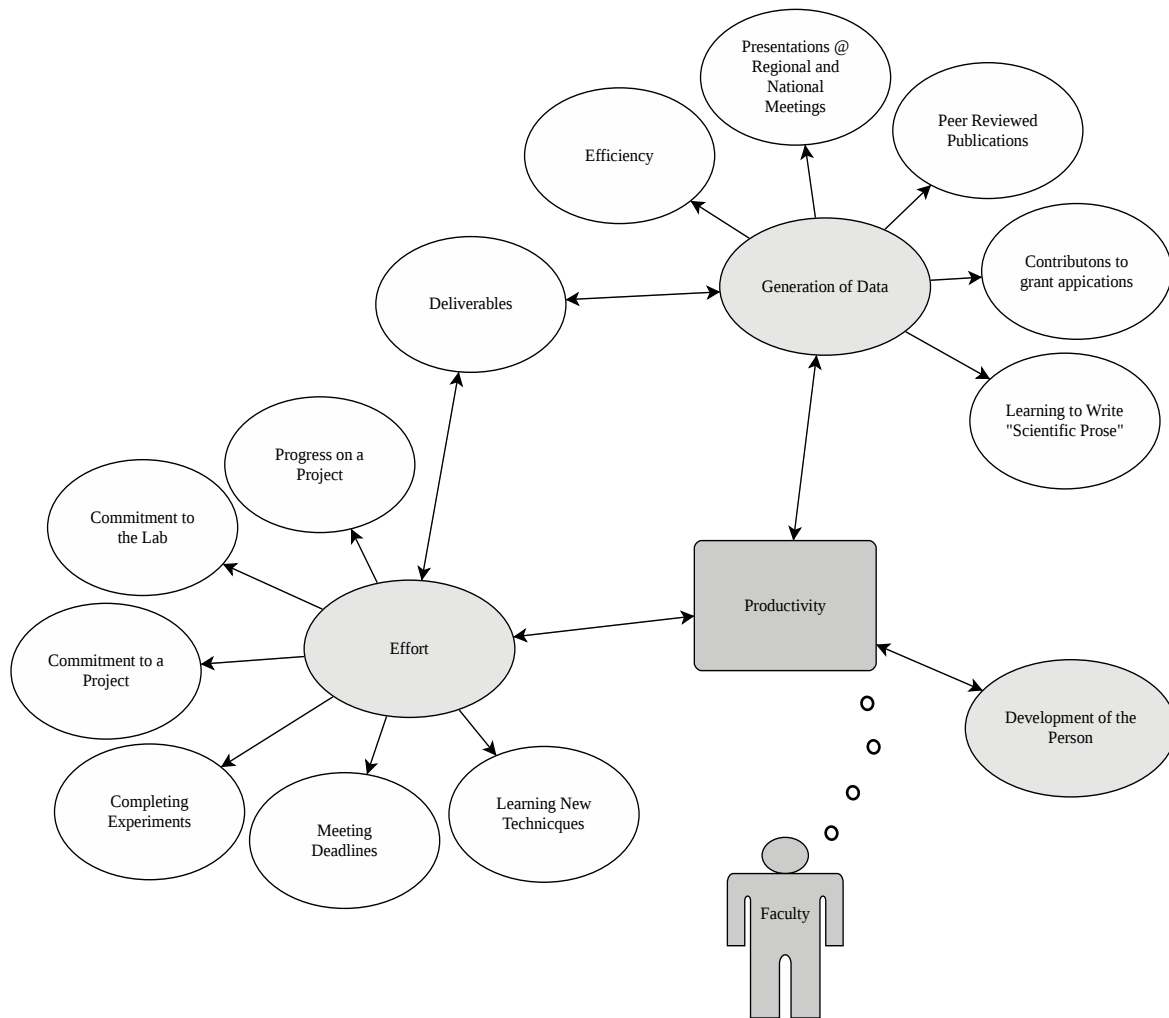


Figure 20 Concept Map Representing Faculty Study Participant's Definition of Productivity

Note. Figure 20 is a concept map representing how Faculty define productivity. Three main themes represent the foundation from which Faculty define productivity including: 1. Effort, 2. Development of the Person, and 3. Generation of Data. Offshoots of Effort identified in the figure represent aspects of productivity categorized as important from Faculty data.

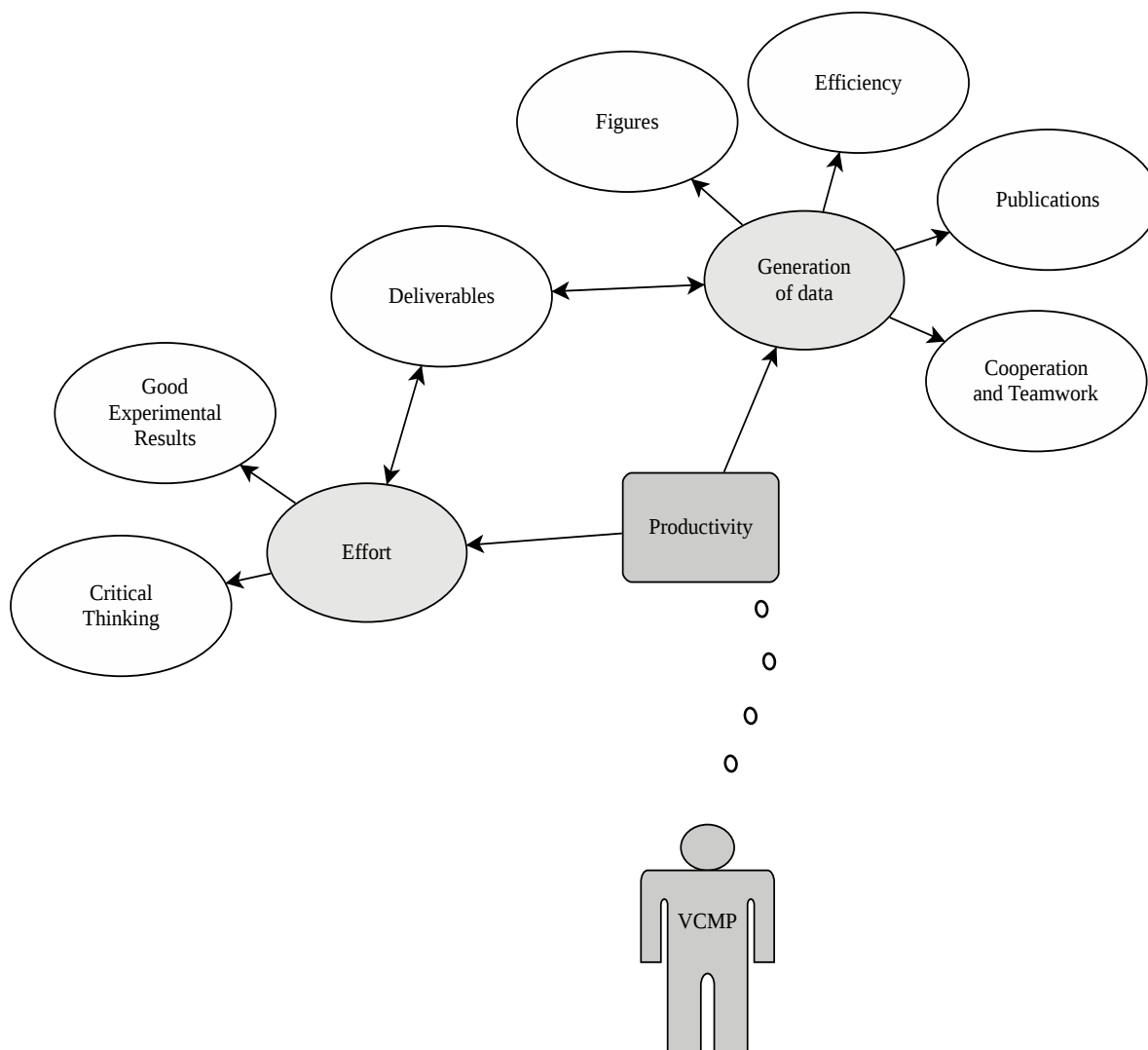


Figure 21 Concept Map Representing Visiting Chinese Medical Professional (VCMP) Study Participant's Definition of Productivity

Note. Figure 21 is a concept map representing how VCMP define productivity. Two main themes represent the foundation from which VCMP define productivity including: 2. Effort and 3. Generation of Data. Offshoots of each main theme identified in the figure represent aspects of productivity categorized as important from VCMP data.

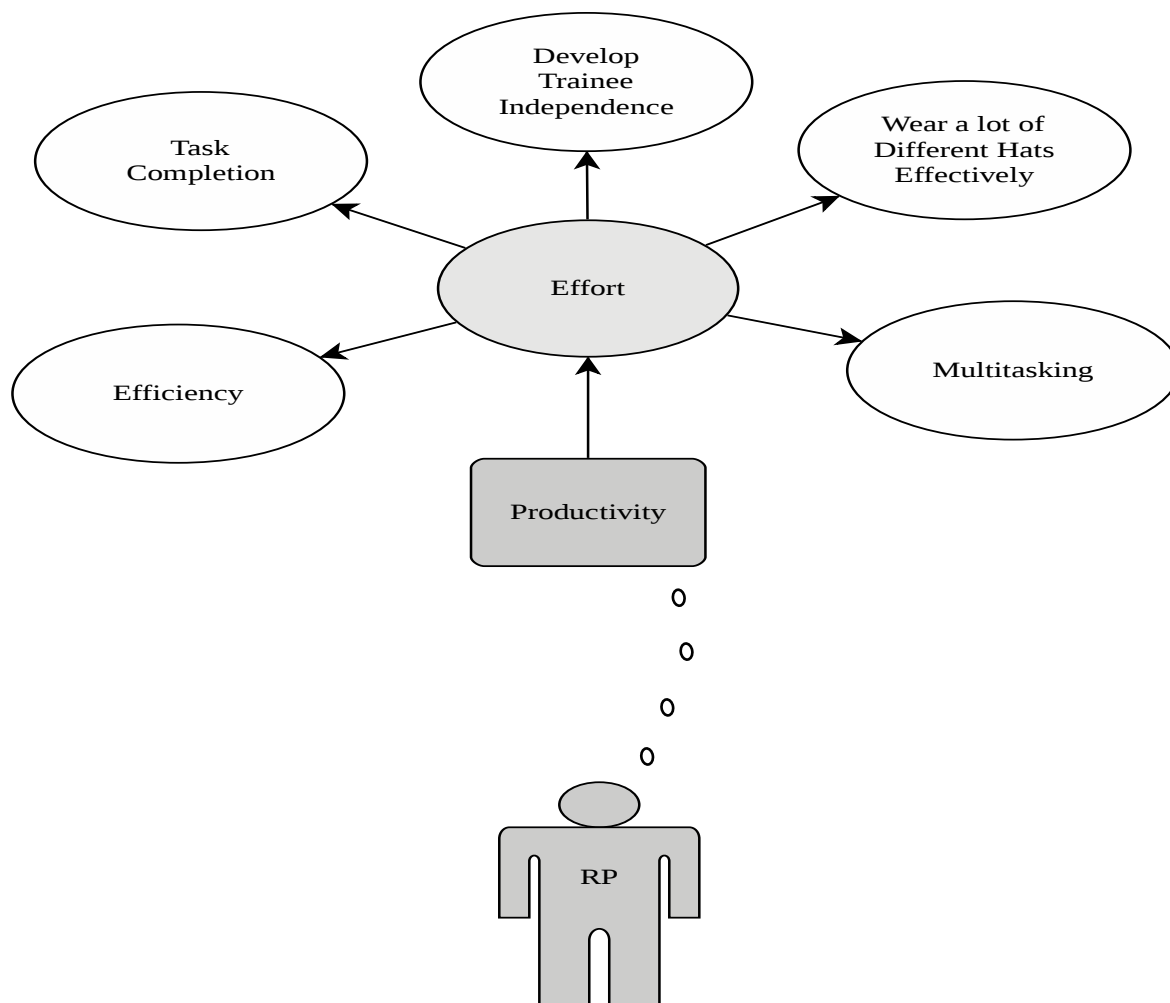


Figure 22 Concept Map Representing Resident Personnel Study Participant's Definition of Productivity

Note. Figure 22 is a concept map representing how RP define productivity. One theme represents the foundation from which RP define productivity, Effort. Offshoots of Effort identified in the figure represent aspects of productivity categorized as important from RP data.

4.3 Identifying the Current Knowledge Sharing System

Identifying the current system in place for knowledge sharing in this transnational biomedical training program is the 3rd specific aim of this dissertation in practice. Personal

experience and the data from study participant interview responses guide the construct of Figures 23-24.

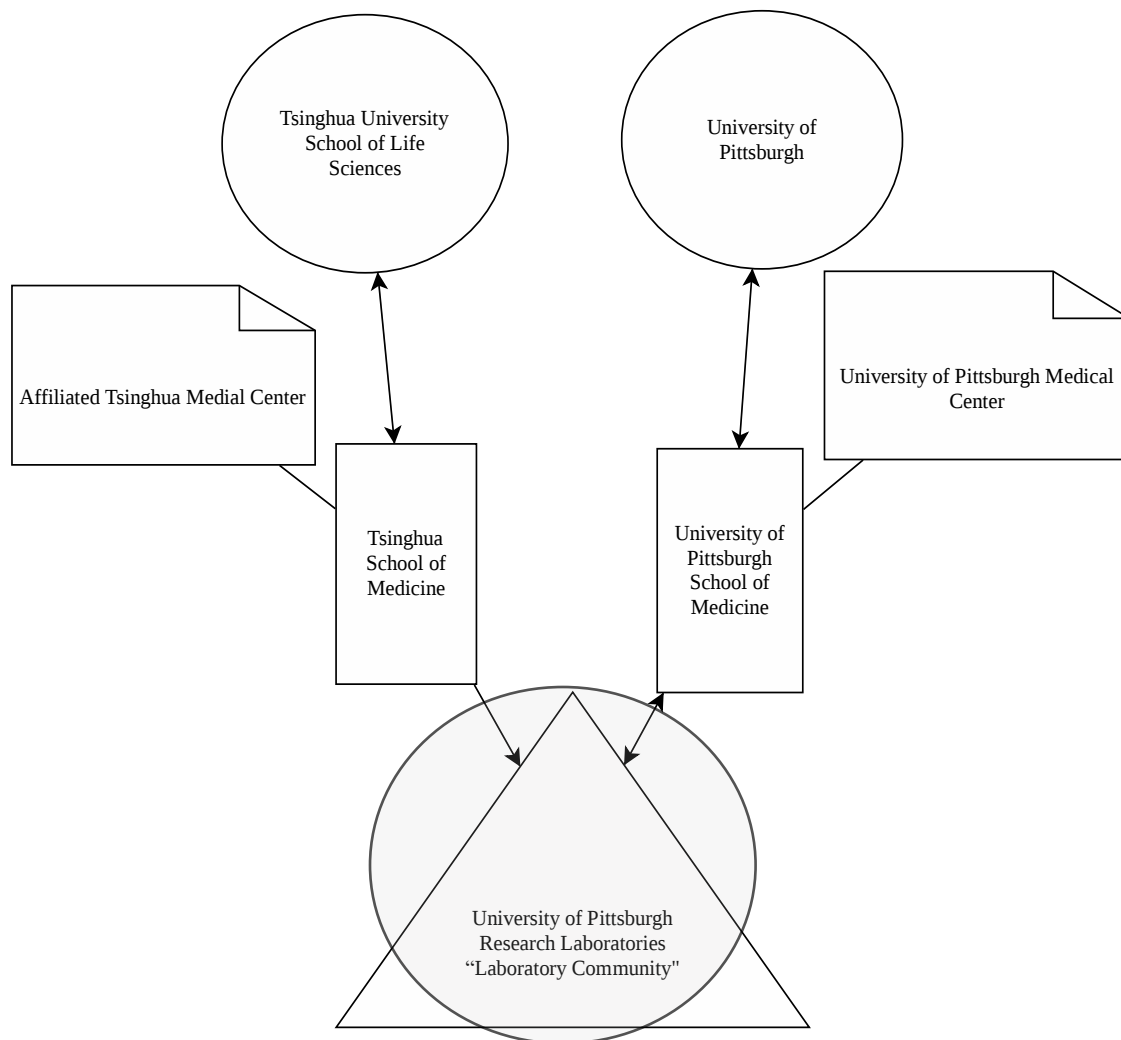


Figure 23 Social and Institutional Architecture of a Transnational Biomedical Research Training Program

Note. Figure 23 is a transnational scale concept map representation of this biomedical research training program and knowledge sharing system. This figure identifies the current social and institutional architecture leading to the grey highlighted training space within the University of Pittsburgh Research Laboratories, *i.e.* “laboratory community.” This highlighted area is the focus of this dissertation of practice and is elaborated upon in figure 24.

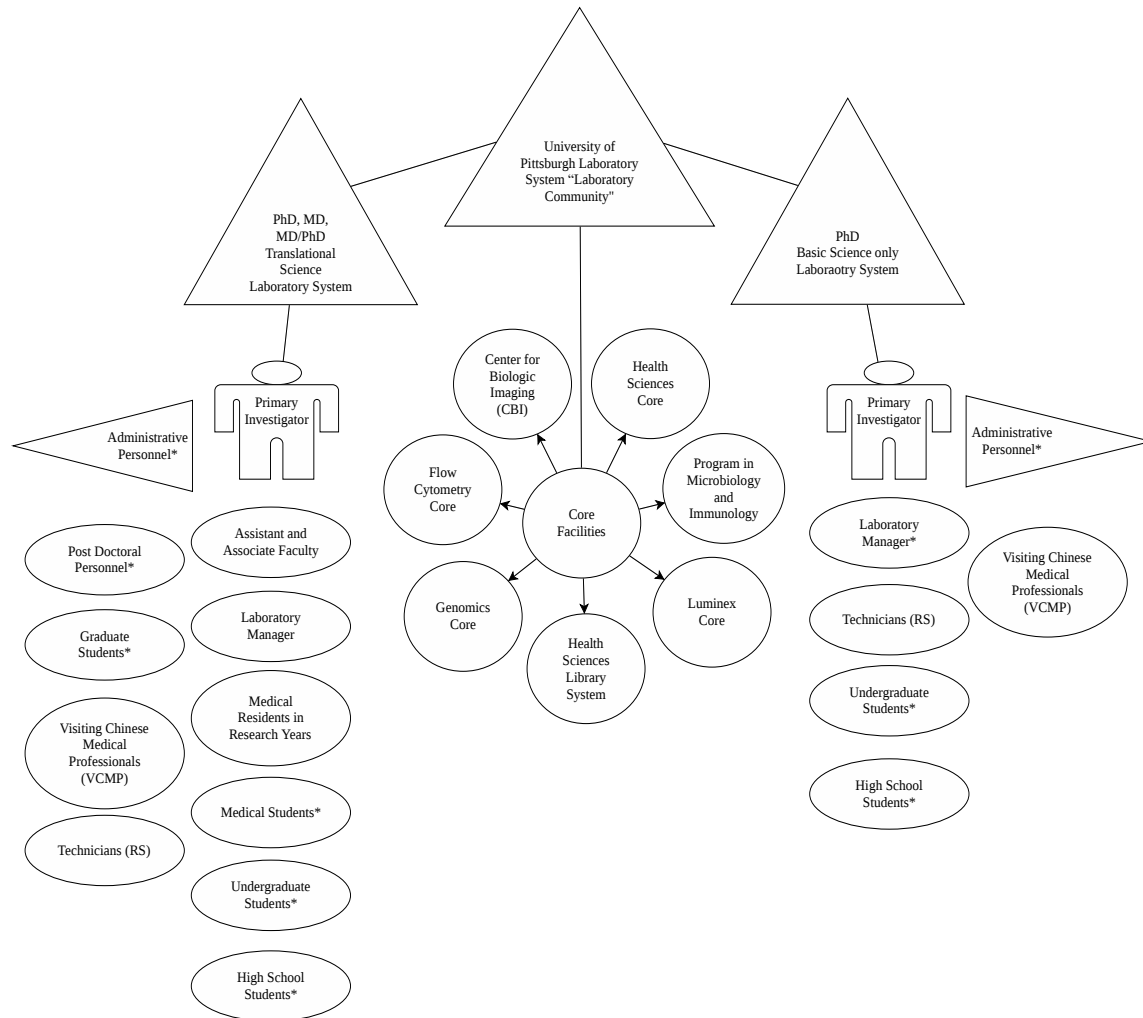


Figure 24 Institutional Architecture of the Laboratory System, "Laboratory Community"

Note. Figure 24 is a concept map representation of two “laboratory communities” operating in this biomedical research training program. A larger “laboratory community” (left) and a smaller “laboratory community” system (right) are depicted. Identified in the middle of the concept map are core facilities which offer services to researchers. These core facilities are part of the resources identified as program strengths in this training program.

* Represents stakeholders whose presence fluctuate in the system. How this system supports knowledge sharing is elaborated in the narrative section.

4.3.1 Identifying the Current Knowledge Sharing System Narrative

The aim of this study to identify the current system in place to support knowledge sharing is reduced to identifying the laboratory systems, i.e. “laboratory community” in place that support knowledge sharing. The laboratory systems functioning in this transnational training program exist and operate along a scale. Some laboratories are run by Primary Investigators (PI) with a PhD. Others are run by Medical Doctors (MD) or Medical Doctors who also hold a PhD (MD/PhD).

Figure 24 shows two “laboratory communities.” Graduate students, medical residents in their research years, medical students, undergraduate students, high school students are all identified as stakeholders whose presence fluctuate depending upon numerous factors. The core facilities are open to all researchers and operate on a pay-for-service basis with the exception of the health sciences library system (HSLs), which is available at no cost. It is worth mentioning that data from several VCMP identify the HSLs as a valuable resource. The VCMP also thought specific training in the HSLs construct and operations would help to make the HSLs experience more efficient and beneficial. Each stakeholder listed in the operating systems have the potential to share knowledge with one another. Data from this study does not support one system dynamic over the other. However, the PhD basic science only run laboratories tend to be able to offer VCMP more direct contact with the PI, which is disclosed by VCMP study participants. Although the larger PhD, MD, or MD/PhD provides the opportunity to perform more direct translational science research and expose VCMP to clinical samples and interactions, data from VCMP disclose a desire to interact with and get feedback from the PI over post docs or graduate students. Translational science is defined by the University of Pittsburgh Clinical and Translational Science Institute as, “an integral part of the National Institutes of Health (NIH) nationwide network that provides the support necessary to bridge the gap between innovative approaches to research and effective

clinical and public health practice and policy” (<https://ctsi.pitt.edu>). Translational research is broken down into three types: developing treatments and interventions, testing efficacy and effectiveness of treatments and interventions, and dissemination and implementation research for system-wide change (<https://www.niehs.nih.gov/research/programs/translational/framework-details>).

4.4 Espoused Values and Organizational Practice

A final aim of this study is to highlight espoused values compared to organizational practice. The data from this study provides insight into a specific ideology that exists in disconnect between stakeholder’s espoused values compared to organizational practice. The data from this program evaluation shows that the organizational practices in place in this training program do not align with the espoused value of diversity and inclusion as outlined by the University of Pittsburgh’s School of Medicine Framework for Diversity, which can be found in Appendix O.

There was a subtly described emergent need from VCMP interviews for a support network. Faculty and RS study participants data indicated that they appreciate what a diverse team can bring to the table and what allowing for true cultural immersion of the VS in our country can offer, yet, there was no data showing any type of support for the creation of a diverse team or cultural immersion. For example, one Faculty study participant stated, “I think it is really tough for some. So, um, my student um so we have lab benches and of course we integrated him into our meetings but I would say he was pretty much he really did not, um you know he stuck pretty close to his colleagues in the program. So, um, I am not sure I would say he was ever really comfortable even after 2 years.”

The espoused value of supporting diversity and inclusion in this institution and research community is not backed by organizational practices. There is no training for study participants nor are there resources committed to these study participants to ensure diversity and inclusion are a reality. The data also show there are no resources dedicated to support VS integration at work or outside of work. Perceived by Faculty and RP as a cultural difference, there is no support in how to regulate long work hours believed necessary to get results by the VCMP. The reality is that the organizational practice holds that we support diversity and inclusion as long as that diverse individual conforms to the existing structure, organizational culture, and system.

I asked study participants if they believed their laboratory changed since accepting VCMP and whether they believe the VCMP were part of the research team. The added responsibility of training was identified by study participants as a noticeable change. And, two Faculty study participants acknowledged a change in the quality of work for the better due to a discrete competitiveness. One Faculty study participant response to this question stated, “Um, they are a team member, they have ownership of that within the group and we make sure that anyone who joins the lab feels like they are a part of the lab. Um and generally that works.” Another Faculty study participant stated, “Yeah, I can’t think of any major changes that have really happened because I just don’t think about it as different than other students, you know. We try to think of realistic projects that can be accommodated in 2-years, um, having more Chinese students means they talk with the Chinese post doc more in Chinese, um but they have all been pretty careful actually not to isolate other people from the conversation, talking English when English speaking people are there, but um besides that, I think, I think honestly the quality of the work has improved.” Another Faculty study participant responses stated, “I don’t know that it changed. There was a little bit of an adjustment.”

The following conversation in a focus group discussion with RP study participants reflects how the espoused value of supporting diversity conflicts with actual organizational practice: RP-A study participant stated, “I mean I think a lot of those people like to work on their own schedules and their own hours, but I don’t think that would make them feel like they are not part of the group. I know X-PI has lab meetings and stuff to include everyone, but, yeah, I think that they feel like they work for a team, but they don’t work with the team. If that makes sense.” RP-B study participant stated, “Yeah, and sometimes they like to do their own stuff so they don’t get yelled at.” RP-A study participant stated, “this depends on themselves really the VCMP. If they don’t want to join the team, we cannot make them. Maybe they only care about their own project, they don’t want to care about others so they don’t want to join.”

4.5 Results Conclusion

The results from this study range from identifying and defining the “laboratory system” as a system supporting this training program to clarifying program goals to mapping how productivity as a goal looks according to each study participant group. Productivity as defined by study participants can be identified by three main themes: effort, generation of data, and development of the person, where effort is also used as a feedback mechanism. This section also provided an in-depth depiction of the SWOB analysis, which is summarized below.

4.5.1.1 Program Strengths

There are four main themes that stand out as program strengths. One, the development of scientific skills set. Two, the experience itself. Personal and professional development were

identified by all study participant groups. One VCMP stated, "Such experience gave concrete impression about how clinical research should be, which enabled me to evaluate myself that whether I am interested or suitable to do research and whether I should choose to pursue it as life-long career. Also, I see real physician scientists here in America and learned about their life and career, so that I know what a great model should be, and I may also have more or less connections to them, which will definitely be beneficial to our future career. Three, the availability of resources at the University of Pittsburgh. Four, the VCMP like the development of data reporting skills that the Methods and Logics course offers them and the peer support network. One VCMP stated, "It's just good to have this kind of supportive group. It is good for your mental health. It is good for your academic world. Ah, yeah, so I think it is a very fantastic course from my perspective."

4.5.2 Program Weaknesses

There are three main themes that stand out as areas for development in this program. One, development of the scientific skills set of writing. Two, disconnect in transparency of laboratory choice and disconnect in expectations and assumptions about bandwidth and capacity of study participants. Three, that Faculty and RP stakeholders do not know about and are not involved in the MLB course or curriculum. This hinders their ability to support the VCMP. For example, one Faculty study participant response was, "I don't know what their curriculum is." A RP stated, "yeah, we also are not looped in on their whole journey. Like I don't know if they have to do an end of their 2 years report or something and I have never seen one of those. I don't know their experience."

4.5.3 Program Opportunities

There are three main themes that stand out as program opportunities. One, the opportunities, both personal and professional that the program itself offers. Two, the evolution of the physician/scientist phenotype and the level of expertise brought by stakeholders. Three, the international collaborative opportunities that are possible from this training program.

4.5.4 Program Barriers

There are two main themes identified as internal barriers in this program. They are time as a resource and cultural differences. There are four themes that emerged from the data as external barriers to the sustainability of this program: Political climate, hate crimes, global pandemic, and a diminished need due to knowledge sharing thresholds.

5.0 Section 5 Discussion

5.1 Implications on Policy and Practice

Bertalanffy's general systems theory framework claims that systems as a whole have physical properties and laws of physics that cannot be reduced to the laws of their simplest components to extrapolate meaning. Systems thinking in this context asks for a better understanding of the dynamics involved in decision-making at each level of this global health education practice. It is a mammoth task.

The impact of this transnational training program is so much more than the individual properties presented in the snapshot of this dissertation. To understand the influence of this transnational training program in global health education practices, it is essential to first diagnose how this transnational training program has impacted this institutional system. It is also important to emphasize these Chinese medical professionals are very young, in their late teens. They have endured a highly competitive life to attend the medical school they are going to and to be able to have this transnational training opportunity.

The snapshot presented from this program evaluation reveals an evolving "laboratory community." Although there are clear areas of disconnect, the evaluation shows that the adaptability of the system within the University of Pittsburgh to accommodate this transnational training program is apparent as it has sustained itself for almost a decade. The evolution of this transnational training program between Tsinghua University School of Life Sciences and the University of Pittsburgh School of Medicine contributes to a potential massive restructuring in global health and global health education practices. The degree of global cooperation is

unprecedented at present. The recent SARS-CoV-2, COVID-19 pandemic has thrust upon us a necessity for global health education and inclusive global health education practices with a sense of urgency. Leaders at the University of Pittsburgh want the institution to continue to be a leader in this type of global initiative.

It is undeniable that knowledge sharing in this global health education practice of transnational biomedical research training is part of the expansion of international activities of the University of Pittsburgh. Figure 25 is an adaptation of *Embracing the World, A Global Plan for Pitt*. As described, aspects of this training program reinforce objectives of each of the four goals outlined in the institution's *Embracing the World, A Global Plan for Pitt* initiative. The following descriptions outline the correlation of *Embrace the World* initiatives to this training program.

1. *Pitt to the World the World to Pitt* – “Connect our domestic and international pursuits to generate synergies that help strengthen our communities.” This training program has connected this institution to international partnerships,
2. *Global Ready* – “Cultivate globally capable and engaged students toward lives of impact in their communities and beyond.” As educators and scientists, we are cultivating globally capable and engaged students. We are reaching communities and impacting lives on a global scale. These young physician/scientists have been able to cultivate a new perspective that impacts how they treat patients and how they approach medicine.
3. *Global Impact* – “Convene a global community of researchers that advances our frontiers of knowledge and tackles real-world problems.” The outcome of fostering the development of the young physician/scientist that comes from this transnational training program directly correlates to this global impact initiative.

4. *Global Operations Support* – “Rewire and improve our infrastructure to streamline, facilitate, and expand engagement with the world.” (www.ucis.pitt.edu, p. 5). Results from this study provide knowledge that can be used to improve the system at Pitt to facilitate global health education practices and help Pitt Embrace the World.



Figure 25 Embracing the World, A Global Plan for Pitt

Note. Figure 25 adaptation of the Global Pitt Plan. The four goals of the plan are represented in the figure

Through programs such as this transnational training program, global connections are established. Faculty and staff in the School of Medicine at The University of Pittsburgh are cultivating young physician/scientists who have the capacity to transform health practices in China. The adaptability of the “laboratory communities” within the University of Pittsburgh School of Medicine (UPSOM) is apparent and program improvements continue to be viable.

The “laboratory community,” as identified in this program evaluation, is a space cultivated from *subcultures* and *microcultures* formed from this cultural integration. Just to reiterate, *Subcultures* exist in occupations within an organization. Subcultures can vary in structure and rigidity. *Microcultures* exist within organizations and subcultures and can be variable and

dynamic. This evaluation shows that study participants hold individual beliefs in how they support this training program that confirm an individualistic approach to perceived success. I am curious to understand how the fixed hierarchical structure of this higher education system impacts individuality and inclusion? I am curious how this individualistic approach influences team-building capacity and program capacity? When supported, individuality can deliver creative approaches and solutions to questions. However, how inclusive are we really if we are just trying to morph a culture, subculture, or microculture into another existing culture as opposed to holding space to embrace the gifts true cultural integration could cultivate? The mission and vision of the University of Pittsburgh Office of Diversity, Equity, and Inclusion does not directly address transnational programs such as this global health endeavor, which emphasizes this special niche in global health education. Practices at this institution could provide a valuable model for other institutions to follow.

Considering Beaver and Weinbaum's (2012) capacity-building framework, I am curious how the training program influences capacity-building of the "laboratory community" from the perspectives of team building and systems thinking? The VCMP have a clear commitment to personal achievement. To build capacity according to the framework, the collective competency of the lab calls for greater investment in developing social capital and commitment to program and laboratory goals. Commitment to personal achievement seen in this program affects both capacity building and the overall "laboratory community."

The VCMP commitment to personal achievement is not so far removed from the personal commitment of Medical Resident stakeholders in their two-year laboratory research rotation. I bring attention to this association because of the demands it places on resources as identified in this evaluation, specifically, the resources of time, bandwidth, and capacity. For example, RP are

expected to train and facilitate the research of both VCMP and Medical Resident groups. Mentors are expected to devote time and resources to developing the scientific skills sets of both groups. VCMP and Medical Residents are strained to compete for resources mainly, time and attention from mentors, resident personnel assistance, and consumable resources, which influences the team-building capacity of the “laboratory community.”

Although this program evaluation shows partial alignment of goals among VCMP and Faculty study participants and, to a lesser degree, VCMP and RP study participants, there is no collective investment in creating a common goal to work toward among training program stakeholders. There is a disconnect among laboratories’ scientific mission and training initiatives. Operating procedures and institutional policy mandates can be difficult to enforce and easy to abandon. This dynamic can create trust issues and disconnect influencing team-building capacity and the overall system.

Another factor influencing capacity building involves mentorship. Faculty are expected to have inherently understood they need to re-frame “being a mentor” to meet the needs of a developing young Chinese physician. During a time when the conversation about mentorship is open to the reality that not every mentor is equipped with the tools for effective mentorship, the fact that mentors are left to “figure it out” seems like a place to improve upon. RP have been expected to devote countless hours to walk side-by-side with VCMP to map unfamiliar territory to help VCMP meet requirements for their medical training as governed by their program. Acknowledging the struggles and successes of these experiences is important for program improvement. A notable avenue for program improvement could be using the resources we have at the University of Pittsburgh and supporting the stakeholders with diversity, inclusion, and equity training.

Program coherence is the strongest component in the capacity building framework. The “laboratory community” tends to have a common working and instructional framework, which helps operations be “productive” even when laboratories might remain in a continuous training loop with annual arrival of new VCMP. Fortunately, the availability of resources is abundant in most cases. However, I am curious how the disparate availability of resources potentially hinders some laboratories’ ability to accept students. I am also curious how the use of both consumable resources and human capital as a resource can be refined.

From this evaluation, it is evident that there are intrinsic motivational factors of RP and Faculty study participants. This intrinsic motivation results in an overall perception of enjoyment of being a part of the cultural interaction and skills development process. Faculty study participants revealed at some point during the interview how impressed they were with the work ethic, determination, and intellect of the VCMP that are part of this training program. Faculty study participants expressed a real satisfaction in the opportunity to share knowledge about science and what it takes to become a scientist with his/her visiting scholar student. Several Faculty study participants even specifically referenced how much joy it brings them to observe the evolution of a scientist in the visiting scholars during their training.

Social capital is built into this program at various levels, and it influences the “laboratory community.” This transnational training program does cater to an elite group, the medical students at Tsinghua University School of Life Sciences. These students have worked extremely hard to have this opportunity. This program evaluation identifies that the visiting scholars who are able to have this training opportunity are at a professional advantage among their peers when they return. One VCMP study participant stated, “Ah, in these two-years training, we are able to do our project, and we are able to publish some papers as first authors, which is unimaginable in China. So, ah, I

think that makes us stand out from others in China.” Another VCMP stated, “Um, ah I think that these years researching. It sets us apart from other MDs. Because, um, in China it [sic] very hard for [sic] in China those MDs and doctors to do, ah, the real scientific research because we don’t have that complete platform.” This experience not only provides opportunity for VCMP as individuals, it provides opportunity for future patients and colleagues too, contributing to an ideology of global health and wellness.

5.1.1 Knowledge Sharing as Practice

In addition to the identification of the “laboratory community,” an aim of this study is to discover knowledge sharing practices. Kirkpatrick’s four level framework is useful for identifying the “laboratory community” as a piece of the larger system in place supporting this transnational training program. This evaluation identifies various program outcomes beyond value-based findings. Capacity-building, systems thinking, and knowledge sharing practices are the focus. In this context, diversity and inclusion have room to breathe. Study participant *reactions* to the training program show a mix of satisfaction and displeasure. Study participant responses identify there to be undeniable *learning* taking place in the development of scientific skills set. Study participant responses demonstrate an evolution of *behavior* that caters to an individualistic approach. Finally, study participant responses indicate that personal growth and cognitive learning, i.e., “the cognitive acquisition of knowledge” is a *result* of this training program (Alvarez, Salas, & Garofano, p. 396).

From the iterative process of coding the data, it is clear that, regardless of learning style or personality, effective knowledge sharing practices in this transnational training program must include the following:

- Formal written protocols inclusive of detailed step-by-step instructions
- One-on-one communication with visual demonstrations of the protocol steps
- One-on-one hands-on teaching/learning with real time feedback mechanisms
- Active real-time feedback mechanisms
- Available resources for troubleshooting

A formal written protocol for the visiting scholars to hold in their hand is necessary for translation purposes. The data show that visiting scholars from China would rather figure it out by themselves than seek help. These cultural and personality differences can interfere with knowledge sharing if ignored. One-on-one communication about a protocol with hands-on instruction is something each RP study participant mentioned as their most effective method of training and knowledge sharing, outside of being able to speak in the native tongue.

Imperative to transnational knowledge sharing is an active feedback mechanism. I am curious about the feedback systems in place in this training program. The obvious feedback mechanism is experimental endpoints and outcomes. However, waiting for the final product and end result could take extensive amounts of time depending upon which scientific model is being used. For example, in-vivo experimentation takes much longer than in-vitro or big data set analysis. Extensive time is something that the VCMP do not have, not to mention the amount of frustration that can ensue from unnecessary and “customary” experimental failures. This evaluation highlights how this feedback mechanism is concealed in “effort” as identified by the common theme among study participant definitions of productivity, and that effort can come at great expense, both personal expense and expense among the “laboratory community.”

Implementing and executing active feedback mechanisms can help to ensure the message between student and teacher is understood in this context. This program evaluation identifies

several feedback mechanisms in place. It appears the MLB course is designed as a feedback mechanism. This course is designed to help the VCMP understand how to articulate their scientific data. However, this evaluation highlights that the actual benefit of this formal feedback mechanism is dependent upon the group facilitator, which resulted in incongruency. Several of the VCMP mention this incongruency. It might even be that this mixed research small-group design was intentional on the part of program coordinators. The expectation may have been that small group presentations and discussions amongst peers would provide feedback for troubleshooting experiments. This feedback did not happen as discussed in the results section of this study due to the variability in fields of research in the make-up of each small group. Developing troubleshooting skills is a form of active feedback that could really benefit stakeholders in the program, but the leap seems too great to attain any real benefit in this situation.

Active feedback mechanisms in place as part of faculty post doc and graduate student development is the practice of verbalizing a scientific result from the execution of a technical task, which demonstrates proficiency. Active feedback mechanisms are important in the development of scientific skills set, specifically, writing and reporting data. Faculty stakeholders agree that having the VCMP actively engage in verbalizing a message demonstrates proficiency, or the lack thereof. For example, one Faculty stakeholder stated, “Yeah, I mean in person. Sitting in person with them and having them present their data. Going through their data with them. Hearing them present. Ah, I think you have a better sense at that point on how to gauge their progress and whether they understand the project and whether they are learning. Another Faculty stakeholder stated, “I think we have a lot of watch one, do one, teach one and um we spend a lot of time in lab meetings looking at the raw data and trouble-shooting through the thought process and, you know, really thinking about every single step in the protocol and, you know, I think that is a really helpful way

of working through the deconstruction of the experiment.” Mentors practice developing the young VCMP physician scientist through active feedback mechanisms of data reporting and, the MLB course is designed to support data reporting and peer derived active feedback to improve the young VCMP scientist. However, this evaluation shows there is disconnect between these two goals. Finding a more streamlined feedback mechanism could help alleviate frustrations among stakeholder groups.

Although this point can’t be directly correlated to the transnational training program, it is worth mentioning that the fear-based consequences approach of many institutional regulatory agencies has changed to embrace a new approach. These regulatory agencies have reframed themselves to become approachable as useful resources instead of feared entities that have begun working with investigators and their teams to identify infractions instead of as separate oversight committees. This restructuring highlights how a systems thinking approach is necessary in implementation of a program such as this one. The influences of this training program on even the subtlest parts of the system make further exploration a tangible obligation.

5.1.2 Espoused Value of a Research Community

Discussing the topic of espoused values and organizational practice is difficult and diagnosing this comparison to the scale I originally intended is saved for future research and practice. The data from this program evaluation shows that the organizational practice in place does not align with the espoused value of diversity and inclusion as it is outlined by the University of Pittsburgh’s School of Medicine. Senior Vice Chancellor Dr. Shekhar’s webpage discussing diversity states,

Whether in the classroom, laboratory, or clinic, diversity is a driver of progress. The likelihood of conquering health disparities and advancing equitable health care is far

greater when individuals of varying backgrounds and perspectives tackle these issues. The University of Pittsburgh's Schools of the Health Sciences are committed to training and supporting a diverse cadre of health professionals and researchers poised to address our country's health care needs. University of Pittsburgh's School of Medicine (2021, <https://healthdiversity.pitt.edu/about/senior-vice-chancellors-message>).

Associate Vice Chancellor Dr. Davis of the University of Pittsburgh's Office of Health Sciences Diversity, Equity, and Inclusion states on their webpage, "By providing access and opportunity for individuals from pre-matriculation through academic and clinical practice, Pitt's health sciences community sustains a supportive and welcoming environment that values the richness diversity achieves" (2021, <https://healthdiversity.pitt.edu/about/associate-vice-chancellors-message>). Associated with the School of Medicine's Office of Diversity, Equity & Inclusion, Dr. Pettigrew, the Associate Dean states,

We feel that diversity and inclusion are measures of distinction and are integral to achieving institutional excellence. They are essential to the development of future physicians who become leaders in medicine. The practice of medicine is a convergence of clinical competence, quality care, passion for investigation, advocacy and a commitment *[sic]* diversity and inclusion" (2021, <http://meddiversity.pitt.edu/associate-dean-diversity-equity-and-inclusion>).

All three of these statements discuss valuing support for diversity, equity, and inclusion. However, the data from this study show there are no resources being used to support stakeholders in this training program. For example, one Faculty study participant stated, "You know we discovered a lot of differences in our cultures as time went on. It might be nice to have some kind of training maybe not just for the mentors but for the people in the lab to get a little bit you know to kind of to learn a little bit more about Chinese culture, um you know what are the differences in what is considered to be polite you know just things like that I think would help." Another Faculty study participant stated, "I am not sure how to measure this or how ethical this is. I would

be curious, I am curious to know whether there are differences in the characteristics of students that went into, um, transnational labs vs Chinese labs. You know just to start to get a sense of, um, you know, because, I think this program is most effective when you have that cross pollination. And, so, I would be interested to know how can we really enhance that in the future you know. How do we get the students feeling more comfortable in, you know, in a different lab and get used to the idea that they don't have to work 24/7; that they are here to broaden their horizons and do other things and yes, they will get a paper and a paper will come, but you know it is very hard because our expectations and their expectations can be very different."

The knowledge sharing model in the current system places the onus of responsibility on attaining knowledge directly onto the VCMP recipient. Frustration and mistakes can be avoided by understanding cultural differences and intricacies of communication. For example, one Faculty stakeholder brought up a conflict that occurred during an exchange between a microscopist and a visiting scholar regarding measurement. It became apparent that measurement did not translate effectively in communication. Measurement to the microscopist was exact. Measurement to the VCMP meant a range without precision. Knowing this difference in meaning and concept exists can help knowledge sharers and knowledge recipients reframe questions and directions to be more inclusive and informative. The thought that exact measurements are not communicated in the same way across the globe is vital to knowledge sharing practices. How do you approach conversations about addressing this disconnect? It isn't enough to just recognize those barriers exist in knowledge sharing. A feedback mechanism is one way to decode communication.

This disconnect in communication does not mean the VCMP in this situation or other VCMP do not understand how to do an exact measurement. It means that asking a question that seems practical and simple as a defining the measurement for a section of tissue requires

recognizing that culture influences both the interpretation and response to even the simplest question. How questions are framed and delivered matters.

5.1.3 Study Challenges

Assessing the contractual agreement between the institutions did not provide any information used in this study and did not assist this program evaluation. Overall participation is a frustrating challenge. I had a great deal of difficulty recruiting both VCMP and RP study participants. This may be partially related to difficulties and uncertainty associated with COVID-19, or it could have been just a normal occurrence that I did not expect to encounter. Language is crucial to clear communication. There were clear language barriers that impacted the interviews with the VCMP. For example, using the language of “knowledge sharing” was not clearly understood or translatable to some VCMP. In 4 of 5 interviews, the VCMP stated they did not know what this meant. I had to elaborate to describe knowledge sharing. My expansion of the language “knowledge sharing” could have influenced the interview in an unintentional way. Another challenge for which I did not have a realistic understanding is the degree of openness and vulnerability study participants were willing to demonstrate. I did not anticipate that study participants might not be willing to fully disclose certain aspects of their experiences in the brief interviews conducted for this study. These are important considerations for study design. A helpful method to add to data collection could be direct observations of other laboratories and the dynamics of the “laboratory communities” that support VCMP.

5.1.4 Future Research

There are so many paths to pursue to enhance institutional capacity through policy and practice related to global health education initiatives such as this transnational training program. Focusing on expanding this program evaluation within the University of Pittsburgh is a valuable next step. Further understanding of the system within could facilitate policy and practice to build capacity and support program sustainability. After completing the inward investigation and diagnosis, directing the investigation outward to analyze comparable programs would be worthwhile. Understanding how other institutions partnering with Tsinghua University School of Life Sciences have built capacity and program sustainability could provide insight into other potential knowledge sharing practices, organizational cultures, and system dynamics in global health education practices. An exploration of how our system compares to other systems supporting global health education practices and training could be valuable. It would also be interesting to study similarities and differences between transnational and domestic training programs.

First, increasing the number within each study participant population could provide additional validity to this study. **Second**, increasing the stakeholder groups to include visionaries and additional stakeholder groups that were not considered in this study. Exploring how far this training program reaches within the University is another point of interest for enhancing study validity and building institutional capacity. **Third**, the voices of RP are left unheard on many accounts in this training program. Exploring this dynamic further could provide avenues for enhancing training practices and capacity building through valuing human capital. **Fourth**, building capacity may be supported through better understanding of fiscal responsibilities. Even though the VCMP arrive with financial support for cost of living, the costs of expendable

resources can sometimes be a strain. The potential fiscal responsibility associated with accepting a VCMP may influence the number of laboratories available to VCMP. I am curious to know how much influence this aspect has on accepting VCMP and program sustainability. Part of understanding how fiscal responsibilities influence capacity building includes a curiosity of the local economic impact of this program. Understanding what impact J-1 Visa holders and VCMP have on the local economy is an interesting aspect of capacity building for the institution. **Fifth**, building capacity may be supported through an exploration of how resource commitment to VCMP influences resource commitment to Medical Residents doing their 2-year laboratory rotation. **Sixth**, an interesting future direction for this research would be to define the cultural identity of this transnational biomedical research training program within this institution. Identifying and gaining an understanding of existing *subcultures* and *microcultures* that are cultivated from the “laboratory community” and this transnational training program would provide useful knowledge about the system. **Seventh**, after exploring the University of Pittsburgh’s system for evaluation, a next step could be to launch a comparison of these findings within the University to the program in Melbourne also in collaboration with Tsinghua University School of Life Sciences. This assessment could provide insight on how knowledge sharing practices and knowledge sharing systems evolve in the niche of biomedical research training and global health education. Additionally, the comparison of these findings to similar programs at other institutions could provide insight on how global health education trends influence organizational cultures and inform global health education practices.

5.1.5 Future Practice and Conclusion

This section incorporates a few suggestions that are mentioned to elicit change and support the program findings.

1. Implement a literature review in his/her field of choice before arrival to the USA into the program curriculum for VCMP will initiate development of the skill of scientific writing earlier.
2. Establish an online learning tutorial that supports a literature review training session that incorporates a “how to” do a literature review and “how to” use The University of Pittsburgh’s health sciences library system (HSLs). Numerous VCMP found the HSLs to be a wonderful resource.
3. Incorporate a global trends and innovation in medicine and science section into the Methods and Logic Course or make it an integrated class for Medical Students and VCMP in the School of Medicine.
4. Incorporate a list of labs that outlines what each laboratory studies, what models they use, and what technology they use to investigate.
5. Provide an annual list that outlines what laboratories each VCMP chose.
6. Provide an annual list that describes VCMP accomplishments that year. This list can be generated from the MLB course final presentations each year. The designated point person from each cohort can be responsible for generating this compilation.
7. Invite all Faculty and staff to the Annual Symposiums to celebrate. This invitation stimulates interest and provides necessary recognition to stakeholders’ hard work and dedication.

8. Generate a “Where are They Now” list to inform us of how this training influences global health education trends and outcomes. Utilize the designated point person from Tsinghua University School of Life Sciences to generate this list.

Future practice for this transnational training program involves leadership and valuing human capital. Exploring ways to build institutional capacity and support global health education practices can be a common goal to work toward. How can we as an institution build capacity to integrate, in a healthier way, the VCMP into our culture? How can we as an institution build capacity to support the cultivation of an environment that creates space for the VCMP cultural expressions? What practices have been identified that support this capacity building? What might the establishment of a multi-disciplinary team of individuals to lead the visiting scholar’s training look like? What might the establishment of multi-institutional and multi-disciplinary partnering look like? Expansion of collaborative networking can support diversity and inclusion initiatives. Involving the School of Health Sciences Office of Diversity, Equity, and Inclusion to support diversity training in the laboratory community and to support VCMP as young physicians could help align espoused values and organization practice. Asking what might the Office of Academic Career Development (OACD), and the Office of International Studies (OIS) in the School of Education have to offer in terms of diversity and inclusion development and implementing those things could help stakeholders align espoused values and organizational practice? How might the existing workforce be supplemented by involvement of these other groups, or similar groups at other institutions? Discovering a team of individuals with expertise and desire to tackle the challenge of transnational training could improve the proficiency of successful knowledge sharing in this global health education practice of transnational biomedical research training. This new system could incorporate faculty and staff from a multi-institutional

pool who are willing to educate VCMP and share knowledge in translational science and clinical practice. This approach can be a multi-directional and progressive tactic to tie science and medicine together to forge a path in global health through global health education practices.

Appendix A Tables Conveying Stakeholder Group Interview Questions and Corresponding Study Inquiry Questions.

Appendix A.1 Interview Questions Faculty

Table 4 Appendix A. 1 Interview Questions Faculty

#	Research Question	Related Inquiry Question
Opening Question	Describe your role and position in the transnational visiting scholar training program.	1c, 3
2	Describe for me how you became a part of the visiting scholar training program.	1b, 2b, 2c
3	In a few words or more how would you describe this visiting scholar training program? Will you I would like for you to describe what the process looks like from the time the visiting scholars arrive to the time they leave.	1b, 1c, 2b, 2c, 3
4	Describe for me how you support the integration of the visiting scholars into your laboratory.	1b, 1c, 2a-2c
5	Explain how your job requirements and responsibilities have changed since accepting students through the training program, or have they?	2a, 3
6	What about this program brings you the most satisfaction?	1b, 1c, 2a, 2c
7	Identify areas in the training program that you would like to see developed or improved.	1b, 1c, 2a, 2c, 3

Table 4 Appendix A.1 Interview Questions Faculty (continued)

#	Research Question	Related Inquiry Question
8	Describe for me how or if your laboratory has changed since the visiting scholars joined your lab?	1b, 1c, 2a-2c, 3
9	The next series of questions involve word association. I am going to say 2-word phrases. Please tell me what comes to mind as they relate to this training program. •Knowledge sharing •Skill development •Communication	2b, 2c
11	What would you like to see added, if anything, to the Visiting Scholar's course work that could help facilitate the lab experience and training process?	1a-1c, 2a-2c, 3
12	Describe how and to whom you communicate ideas you have about the training program.	1b, 2a-2c, 3
13	How do you define productivity? •How has your view of productivity been influenced by this transnational training program?	1a, 2b, 2c
14	Is there any aspect of a program evaluation that you would find most beneficial to know about?	1a, 2a
15	Describe any boundaries you may have regarding intellectual property or intellectual rights or does that matter to you?	1b, 2b, 2c
End Question	Is there anything you would like to discuss that we may have missed?	1a-1c, 2a-2c, 3

Note. All inquiry questions in this table are designed to address the inquiry themes of strengths and areas for development in this transnational biomedical research training program related to global health education practices.

Appendix A.2 Interview Questions Visiting Chinese Medical Professionals (VCMP)

Table 5 Appendix A.2 Interview Questions Visiting Chinese Medical Professionals (VCMP)

#	Research Question	Related Inquiry Question
Opening Question	Describe for me the visiting scholar training program?	1b, 1c, 2b, 2c, 3
2	Describe for me what about this program brings you the most satisfaction.	1b, 1c, 2a, 2c
3	Identify aspects of your experience that you believe to be successful parts of this training program.	1b, 1c, 2b, 2c
4	Identify areas in the training program that you would like to see developed or improved.	1b, 1c, 2b, 2c, 3
5	Describe for me your experience with the Methods and Logic course and how the coursework is helpful to your lab experience.	1b, 1c, 2a-2c, 3
6	Would you like to see anything added to the Methods and Logic curriculum that would help your training experience and your research?	1b, 1c, 2b, 2c, 3
7	Describe for me the integration process into the lab you chose. •Do you feel you belong to part of the laboratory research team? •Describe what makes you feel that way?	1b, 1c, 2b, 2c, 3
8	Describe ways you believe this program is helping global health education.	1b, 2b, 2c
9	Did you join any groups in the local community while you were here? •If yes, what types? •If no, what types might you like to have joined?	1a-1c, 2b, 2c
10	How do you define productivity? •How has your view of productivity been influenced by this transnational training program?	1b, 2b, 2c
11	Tell me which type or combination of types of learning you find most helpful: visual, auditory, written.	1b, 2b, 2c

Table 5 Appendix A.2 Interview Questions Visiting Chinese Medical Professionals (VCMP) (continued)

#	Research Question	Related Inquiry Question
12	Do you feel satisfied with the knowledge sharing provided in this program, Yes or No? •Share your perspective on knowledge sharing. •How would you improve knowledge sharing? •List some of the most useful knowledge you obtained while training at the University of Pittsburgh.	1b, 1c, 2a-2c, 3
13	Do you feel satisfied with the skill development you obtained provided in this program, Yes or No? •List some of the skills you obtained in this training program at the University of Pittsburgh. •Of the skills you obtained, which ones do you think are most useful skills for you?	1b, 1c, 2a-2c, 3
14	Describe how this training experience has helped you professionally.	1b, 1c, 2a-2c
15	Describe ways this training experience has helped you develop personally.	1b, 1c, 2a-2c
16	How could we have helped support you more in the lab?	1b, 1c, 2a, 2c
17	Identify some things you learned from this training program experience	1b, 1c, 2c, 3
18	What made you choose the University of Pittsburgh over Melbourne?	1b, 2a
End Question	Is there anything you would like to add to this discussion?	1a-1c, 2a-2c, 3

Note. All inquiry questions in this table are designed to address the inquiry themes of strengths and areas for development in this transnational biomedical research training program related to global health education practices.

Appendix A.3 Interview Questions Resident Personnel (RP)

Table 6 Appendix A.3 Interview Questions Resident Personnel (RP)

#	Research Question	Related Inquiry Question
Opening Question	Describe for me your role with the visiting scholars and their training.	1c, 3
2	Were you told anything about the visiting scholar training program by anyone?	1b, 2a-2c, 3
3	Describe for me your perspective on the integration process of the visiting scholars as they came into your lab.	1b, 1c, 2b, 2c, 3
4	Do you feel the visiting scholars belong to the research team that you are a part of? •Describe what makes you feel that way?	1b, 2a-2c
5	Describe for me what about working with and training the visiting scholars brings you the most satisfaction.	1b, 1c, 2b, 2c
6	Identify aspects of your experience working with and training the visiting scholars that you believe to be successful, not just satisfying but successful.	1b, 1c, 2b, 2c
7	Identify aspects in your experience working with and training the visiting scholars that you found to be difficult. How would you develop or improve these things?	1b, 1c, 2b, 2c
8	How do you define productivity?	1a, 2b, 2c
9	How has your view of productivity been influenced by this training program?	1c, 2b, 2c
10	Tell me which type or combination of types of learning you find most helpful: visual, auditory, written 1. As a learner 2. As a teacher	1b, 2b, 2c
11	What would have helped support you in your training abilities and process in your lab as you trained the VCMP?	1b, 1c, 2a, 2c

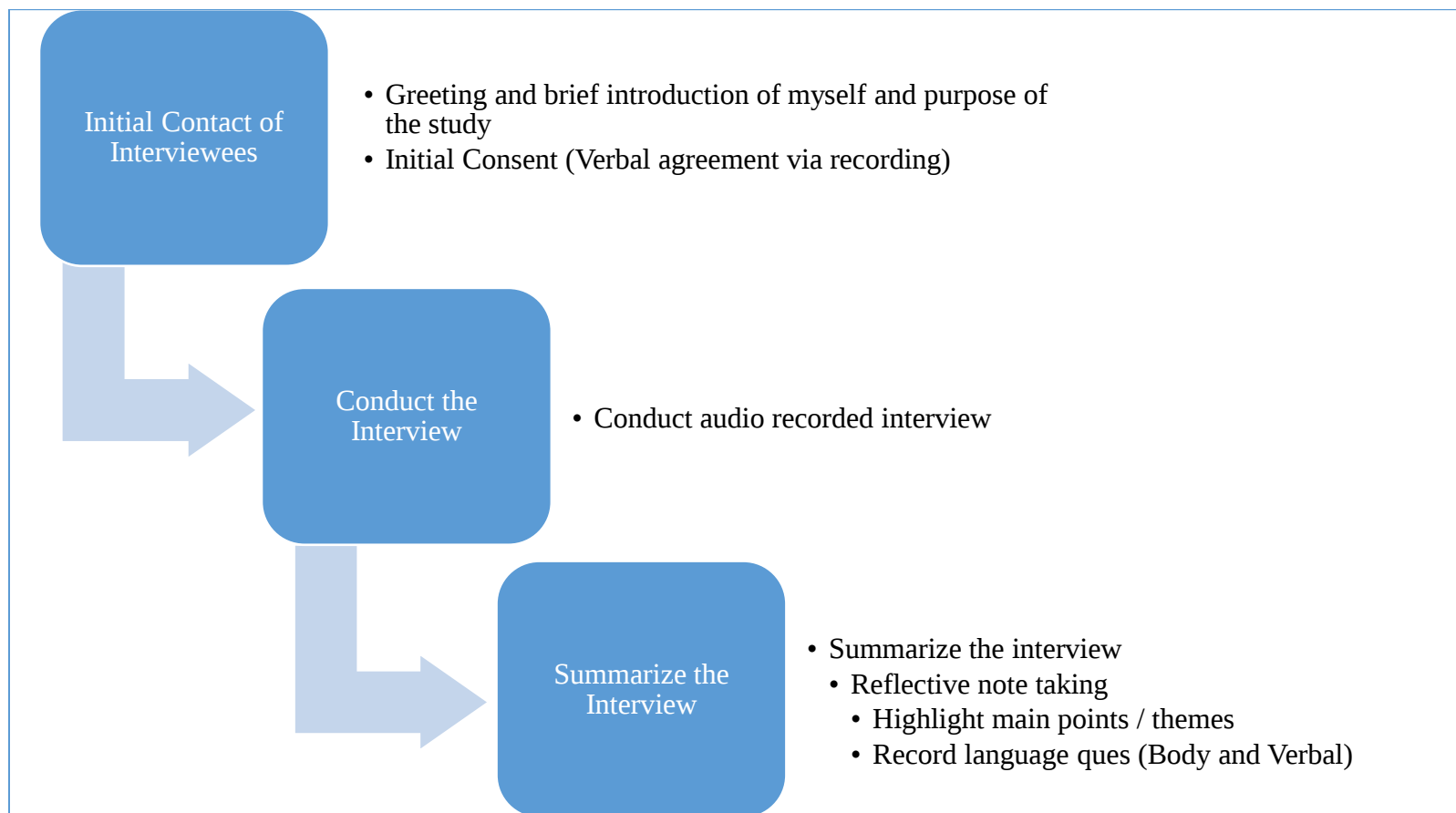
Table 6 Appendix A.3 Interview Questions Resident Personnel (RP) (continued)

#	Research Question	Related Inquiry Question
12	Describe ways this training experience has helped you develop both personally and professionally	1b, 1c, 2a, 2c
13	The next series of questions involve word association. I am going to say 2-word phrases. Please tell me what comes to mind as they relate to this training program. •Knowledge sharing •Skill development •Communication •Belonging •Support	1b, 2a, 2b
14	Describe ways you believe this program is helping global health education.	1b, 2b, 2c
15	Identify developments or changes in the program you would recommend to advance global health education.	1b, 2b, 2c
16	Can you each identify a few things that you have learned from being a part of this training program, outside of what you have already discussed. Things that you have learned from being a part of this training program and training experience.	1b, 2a, 2c
17	Describe any boundaries you have regarding intellectual rights or intellectual property, or does that even matter to you?	1b, 2b, 2c
End Question	Is there anything else you would like to add to this discussion?	1a-1c, 2a-2c, 3

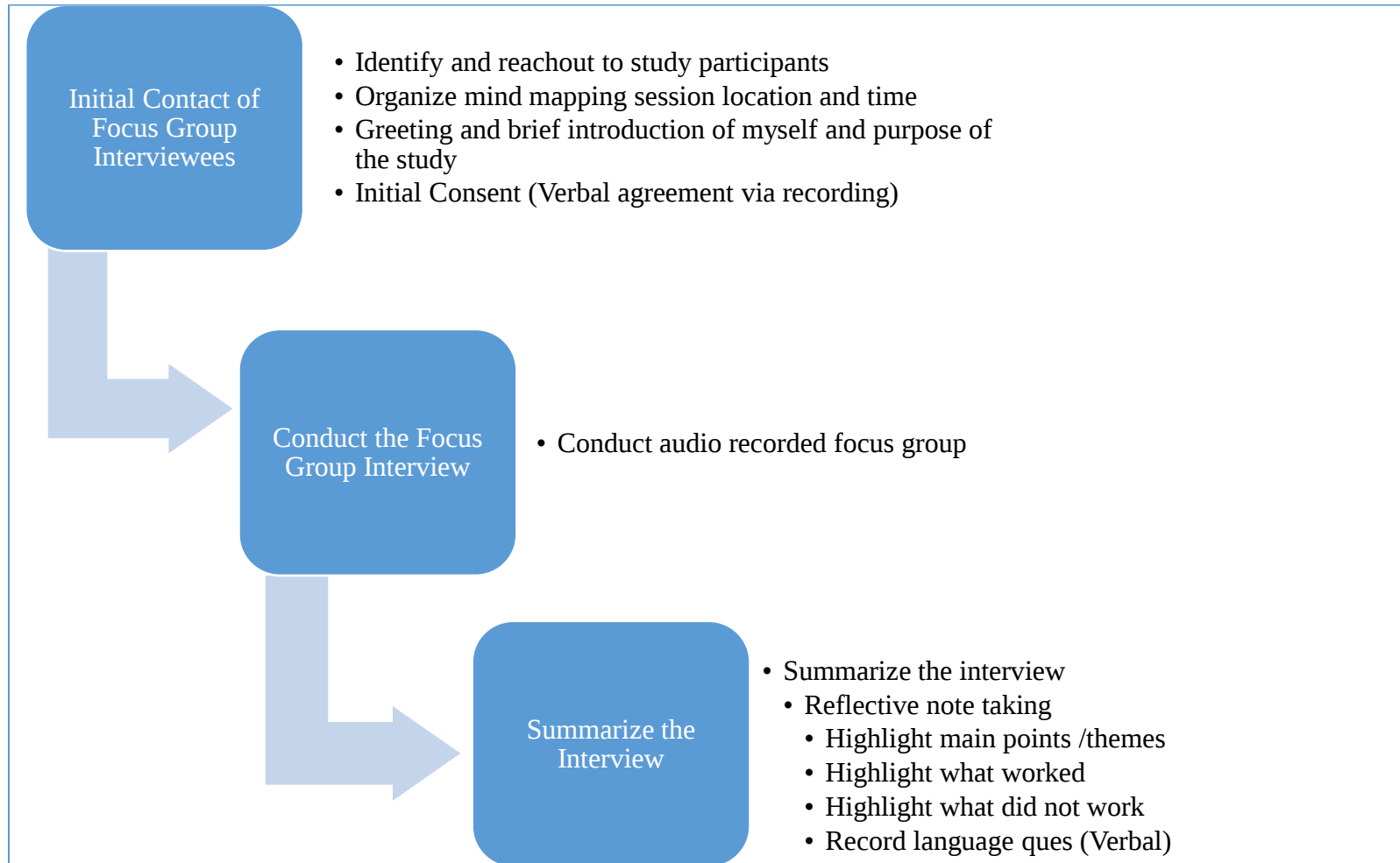
Note. All inquiry questions in this table are designed to address the inquiry themes of strengths and areas for development in this transnational biomedical research training program related to global health education practices.

Appendix B Visual Aids Representing Personal Interview Protocols

Appendix B.1 Personal Interview Protocol Overview



Appendix B.2 Focus Group Interview Protocol Overview



Appendix C Example Protocol for Conducting In-Depth Personal Interviews for Evaluation Input (Boyce and Neal, 2006)

- I. Interview guide
 - A. Introduction and Justification
 - B. Methodology
 - 1. How was the process carried out? (Describe the process of selecting the interviewees and conducting the interviews.)
 - 2. What assumptions are there (if any)?
 - 3. Are there any limitations with this method?
 - 4. What instruments were used to collect data?
 - 5. What sample(s) is/are being used?
 - 6. Over what period of time was this data collected?
 - C. Results
 - 1. What are the key findings?
 - 2. What were the strengths and limitations of the information?
 - 3. Where and how are the results similar and dissimilar to other findings (if other studies have been done)?
 - D. Conclusion and Recommendations
 - E. Appendices (inclusive of interview guide(s)).
- II. Process for conducting in-depth interviews.
 - A. Plan
 - 1. Identify stakeholders.
 - 2. Identify information sources and information needed.
 - 3. List stakeholders to be interviewed. Identify stakeholder groups and levels. Additional interviewees may be identified during data collection. Determine sample size if necessary.
 - 4. Ensure research follows international and national ethical standards.
 - B. Develop Instruments.

1. Develop interview protocol – rules used to guide administration and implementation of the interview. This procedure ensures the reliability of data collected.

- a) What to say to interviewees when setting up the interview;
- b) What to say to interviewees when beginning the interview, including ensuring informed consent and confidentiality of the interviewee;
- c) What to say to interviewees in concluding the interview;
- d) What to do during the interview (take notes, audio/visual recording)
- e) What to do following the interview (notes, summarize key information, transcribe interview)
- f) Develop an interview guide that lists questions or issues to be explored, including informed consent form. *note, a separate interview guide may be necessary for each group of stakeholders. Translate these guides when necessary.

Interview Question Tips

- Questions should be open-ended rather than closed-ended. For example, instead of asking “Do you know about the clinic’s services?” ask “Please describe the clinic’s services.”
- You should ask factual question before opinion questions. For example, ask, “What activities were conducted?” before asking, “What did you think of the activities?”
- Use probes as needed. These include:
 - Would you give me an example?
 - Can you elaborate on that idea?
 - Would you explain that further?
 - I’m not sure I understand what you’re saying. Is there anything else?

C. Train data collectors

1. Identify and train interviewers.

Training Tips for Data Collectors

- An introduction to the evaluation objectives,
- A review of data collection techniques,
- A thorough review of the data collection items and instruments,
- Practice in the use of the instruments,
- Skill-building exercises on interviewing and interpersonal communication, and
- Discussion of ethical issues.

D. Collect data

1. Set up interviews with stakeholders (be sure to explain the purpose of the interview, why the stakeholder has been chosen, and the expected duration of the interview).
2. Seek informed consent of the interviewee (written or documented oral). Re-explain the purpose of the interview, why the stakeholder has been chosen, expected duration of the interview, whether and how the information will be kept confidential, and the use of a note-taker and/or tape recorder.
3. If interviewee has consented, conduct the interview.
4. Summarize key data immediately following the interview.
5. Verify information given in interviews as necessary. For example, if an interviewee says that a clinic has a policy of not providing services to anyone under 16, you should verify that information on your own with the clinic.

E. Analyze Data

1. Transcribe/Review data.
2. Analyze and interpret interview data.

Tips on Analyzing Interview Responses

- Read through the interview responses and look for patterns or themes among the participants.
- If you get a variety of themes, see if you can group them in any meaningful way, such as by type of participant. You may, for example, find that younger participants tend to think and feel differently from older ones or that men and women respond differently.
- You can also identify the responses that seem to have been given with enthusiasm, as opposed to those that the participants answered in only a few words.

F. Disseminate findings

1. Write report.
2. Solicit feedback from interviewees and program stakeholders.
3. Revise.
4. Disseminate the revised report to interviewees, program stakeholders, funders, and the community as appropriate.

Appendix D Personal Interview Protocol Guide

I. Prepare for interview sessions

A. Rules used to guide the administration and implementation of the interview. This procedure ensures the reliability of data collected.

1. Write request for study participation.
2. Design interview day.
3. During the interview, take notes, audio/visual recording.
4. Following the interview, write notes, summarize key information, and transcribe interview.

B. Ensure appropriate accommodations are available for virtual interview sessions due to SARS-CoV-2, COVID-19 restrictions.

C. Develop an interview guide that lists questions or issues to be explored, including an informed consent form. *note, a separate interview guide may be necessary for each group of stakeholders. These guides can be translated when necessary.

1. Identify period of time over which data collection occurs.
2. Label each guide by the stakeholders involved.

D. Identification of stakeholders.

1. Identification of all faculty hosting transnational visiting scholars from Tsinghua University School of Life Sciences.
2. Obtain list of all faculty members hosting visiting scholars from School of Medicine administrative office.
3. List all faculty members in Excel.
4. Randomization and selection of faculty members.

E. Predetermine interview locations. *All interviews conducted virtually due to SARS-CoV-2, COVID-19 restrictions.

F. Initiate contact with randomly chosen faculty members via email.

1. Identify study purpose.
2. Request stakeholder's consent and time for interview.

3. Schedule interview.

G. Schedule ZOOM or TEAMS meeting.

H. Ensure technical resources are working for audio/visual recording of interview.before conducting each interview.

I. Meet stakeholders at scheduled time in virtual meeting room.

J. Conduct interview.

K. Follow up email expressing gratitude for time and effort of study participants.

Appendix E Focus Group Protocol

I. Prepare for Focus Group Sessions

A. Identify focus group study participants

1. Study participants chosen as part of randomly selected faculty members.

B. Prepare email request for participation to distribute to potential study participants.

C. Ensure appropriate accommodations are available for virtual interview sessions due to SARS-CoV-2, COVID-19 restrictions.

II. Schedule Focus Group Sessions Develop Instruments

A. Rules used to guide the administration and implementation of the interview. This procedure ensures the reliability of data collected.

1. Write request for study participation.
2. Design virtual interview day.
3. During the interview, take notes, audio/visual recording.
4. Following the interview write notes, summarize key information, and transcribe interview.

B. Initiate contact with focus group participants.

1. Send initial contact email and identify study purpose and invite requesting participation.
2. Define groups for focus group sessions.
3. Schedule focus group.

C. Predetermine focus group location – All virtual via ZOOM or TEAMS due to SARS-CoV-2, COVID-19 restrictions.

D. Schedule ZOOM or TEAMS meeting.

E. Email invite to ZOOM or TEAMS meeting to focus group participants.

F. Ensure technical resources are working for audio recording of interview before conducting each interview.

G. Meet stakeholders at scheduled time.

H. Conduct focus group session.

1. Opening statement of objectives.
 2. Focus group session.
 3. Concluding remarks and appreciation.
- I. Follow up email expressing gratitude for time and effort of study participants.

Appendix F Initial Contact Email Requesting Study Participation – One-on-One Sessions

Dear (Insert name of study participant),

My name is Lauryn Kohut. I have worked with Dr. Billiar and the Department of Surgery at the University of Pittsburgh for over 16 years. I have been training visiting scholars from both Xiangya School of Medicine and Tsinghua University School of Life Sciences since the inception of the collaborative endeavors. Currently, I am in charge of project organization and team building for the laboratories of Drs. Zuckerbraun and Neal. I am also a doctoral student within the School of Education at the University of Pittsburgh.

I am writing to inquire about your willingness to participate in my doctoral research project. I am performing a program evaluation for the School of Medicine on knowledge sharing practices in global health education. Specifically, I am interested in stakeholders' perspectives on knowledge sharing in the laboratories as a means of identifying current practices in the Transnational Biomedical Research Training Program. I want to discover areas of strength and areas for program development to make this transnational training program more effective in global health education.

Would you be willing to participate in my program evaluation? This will entail a 30-minute interview session via TEAMS or Zoom. Thank you for your consideration and time. I look forward to hearing from you.

Kind Regards,

Lauryn Kohut, M.A.
Research IV, Laboratory Manager / Educator
Department of Surgery
University of Pittsburgh
200 Lothrop St., W902 BST
Pittsburgh, PA 15213
412-335-5627
Lkt2@pitt.edu
taitlk@upmc.edu

Appendix G Initial Contact Email Requesting Study Participation – Focus Group Sessions

Dear (Insert name of study participant),

My name is Lauryn Kohut. I have worked as a Research Specialist in the Department of Surgery at the University of Pittsburgh for over 16 years. I am also a doctoral student within the School of Education at the University of Pittsburgh. I have been training visiting scholars from both Xiangya School of Medicine and Tsinghua University School of Life Sciences since the inception of the collaborative endeavors.

I am writing to inquire about your willingness to participate in my doctoral research project. I am performing a program evaluation for the School of Medicine on knowledge sharing practices in global health education. Specifically, I am interested in stakeholders' perspectives on knowledge sharing in the laboratories as a means of identifying current practices in the Transnational Biomedical Research Training Program. I believe your role as a (insert their Research Role here) is an extremely valuable piece of this program. I would really like to hear your perspective.

Would you be willing to participate in my program evaluation? This will entail a 30–45-minute focus group session via TEAMS or Zoom. Thank you for your consideration and time. I look forward to hearing from you.

Kind Regards,

Lauryn Kohut, M.A.
Research IV, Laboratory Manager / Educator
Department of Surgery
University of Pittsburgh
200 Lothrop St., W902 BST
Pittsburgh, PA 15213
412-335-5627
Lkt2@pitt.edu
taitlk@upmc.edu

Appendix H Informed Consent -Developing an Understanding Evaluation

The purpose of this interview today is to hear about your experiences and to listen to your perspectives on the transnational biomedical training program. This interview is part of a program evaluation I am conducting to identify knowledge sharing practices, strengths, and areas for development as part of global health education practices.

All responses will be kept anonymous and confidential. You do not have to talk about anything you feel uncomfortable answering. You may end this interview at any time. With your verbal consent on this recording we can begin. Do you have any questions?

*All interviews were conducted via Microsoft TEAMS or Zoom due to SARS-CoV-2, COVID-19 restrictions. Therefore, all consent was verbal.

Appendix I Study Participation Thank You Email

Dear (Insert name of study participant),

Thank you for being a part of my program evaluation and for being so gracious with your time. Your sincerity and perspective are valued and greatly appreciated. Again, I want to assure you that all responses will be kept confidential. I look forward to our future interactions.

Kind Regards,

Lauryn Kohut, M.A.

Research IV, Laboratory Manager / Educator

Department of Surgery

University of Pittsburgh

200 Lothrop St., W902 BST

Pittsburgh, PA 15213

412-335-5627

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Appendix J Organizational Chart Exhibits

Appendix J.1 Organizational Chart Depicting Levels of Institutional Involvement in the Transnational Training Program

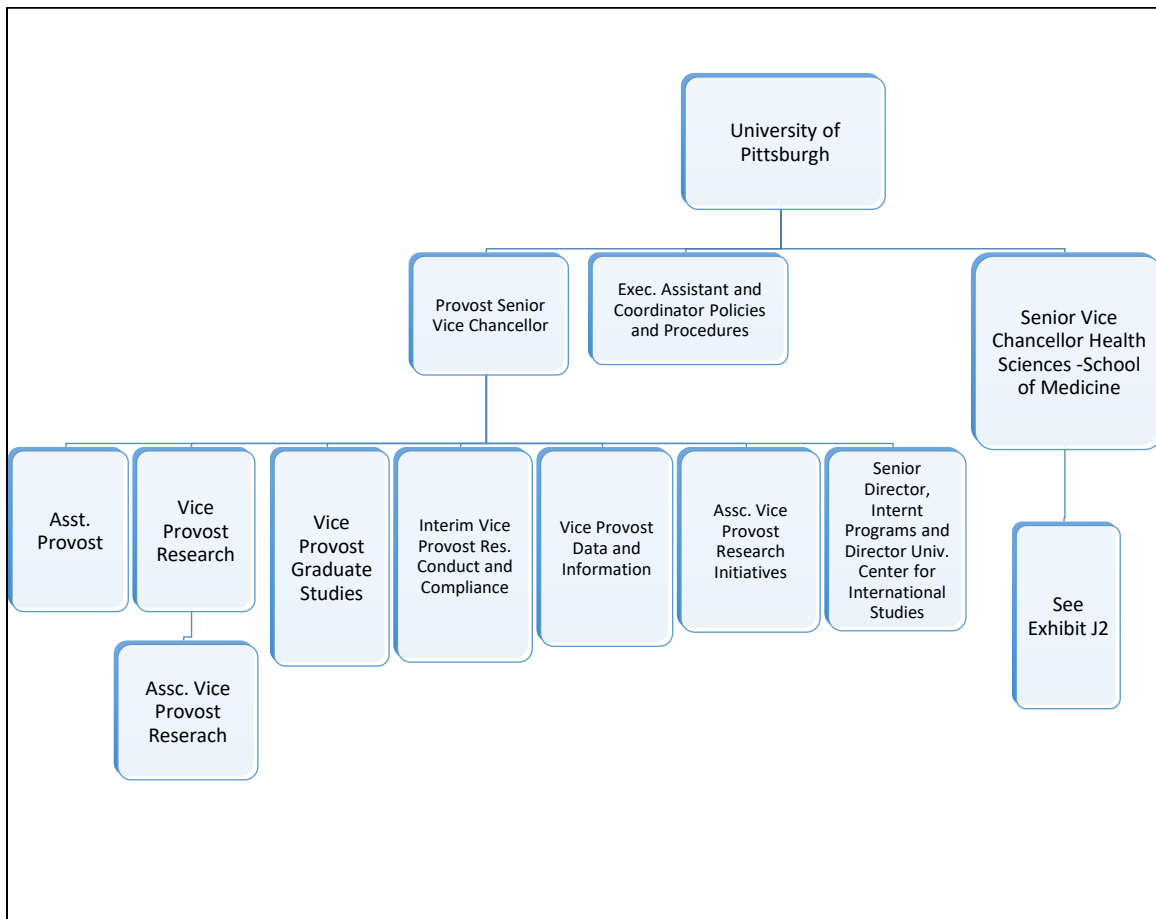


Figure 26 Appendix J.1 Organizational Chart Depicting Levels of Institutional Involvement in the Transnational Training Program

Appendix J.2 Organizational Chart Depicting Levels of Institutional Involvement in the Health Sciences for the Transnational Training Program

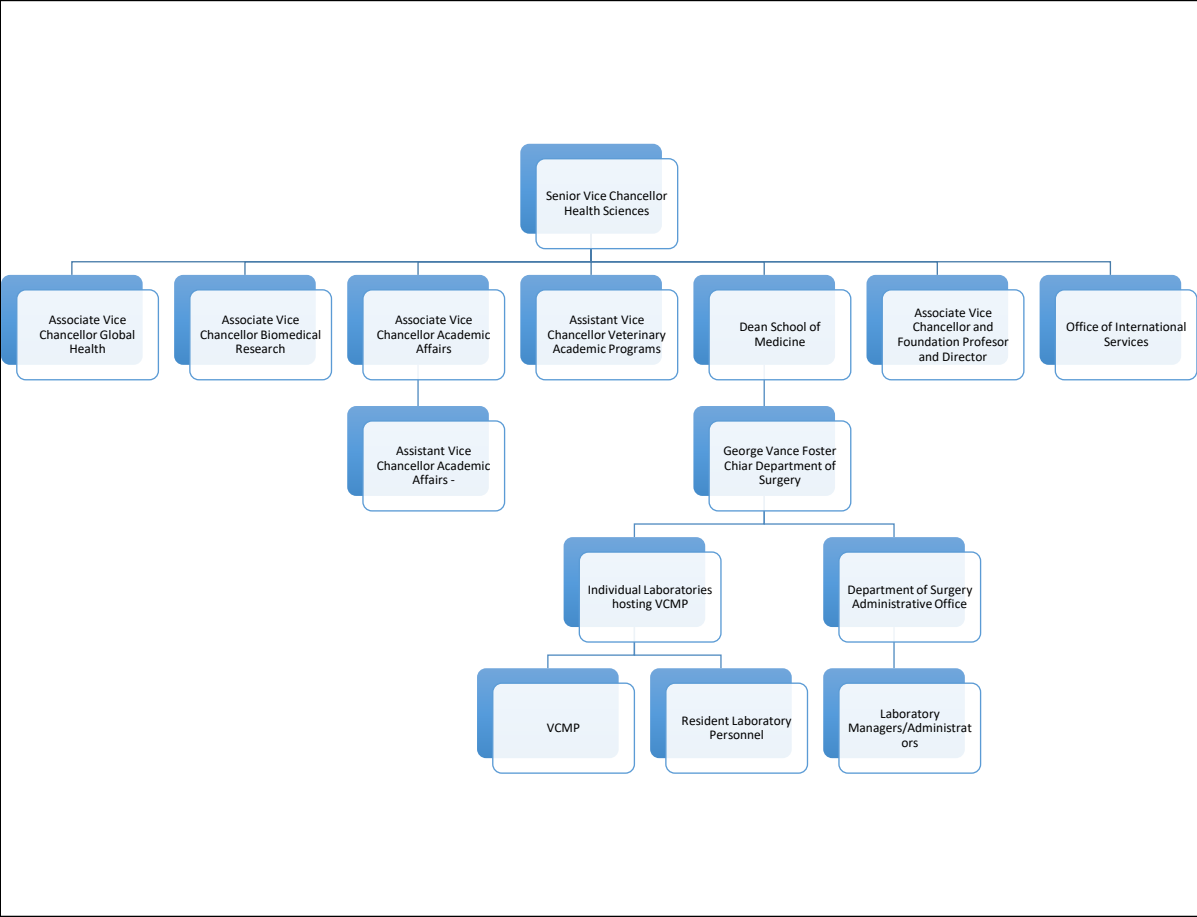


Figure 27 Appendix J.2 Organizational Chart Depicting Levels of Institutional Involvement in the Health Sciences for the Transnational Training Program

Appendix K Timeline of Events Leading to the Establishment of Centers for Transnational Interactions at the University of Pittsburgh

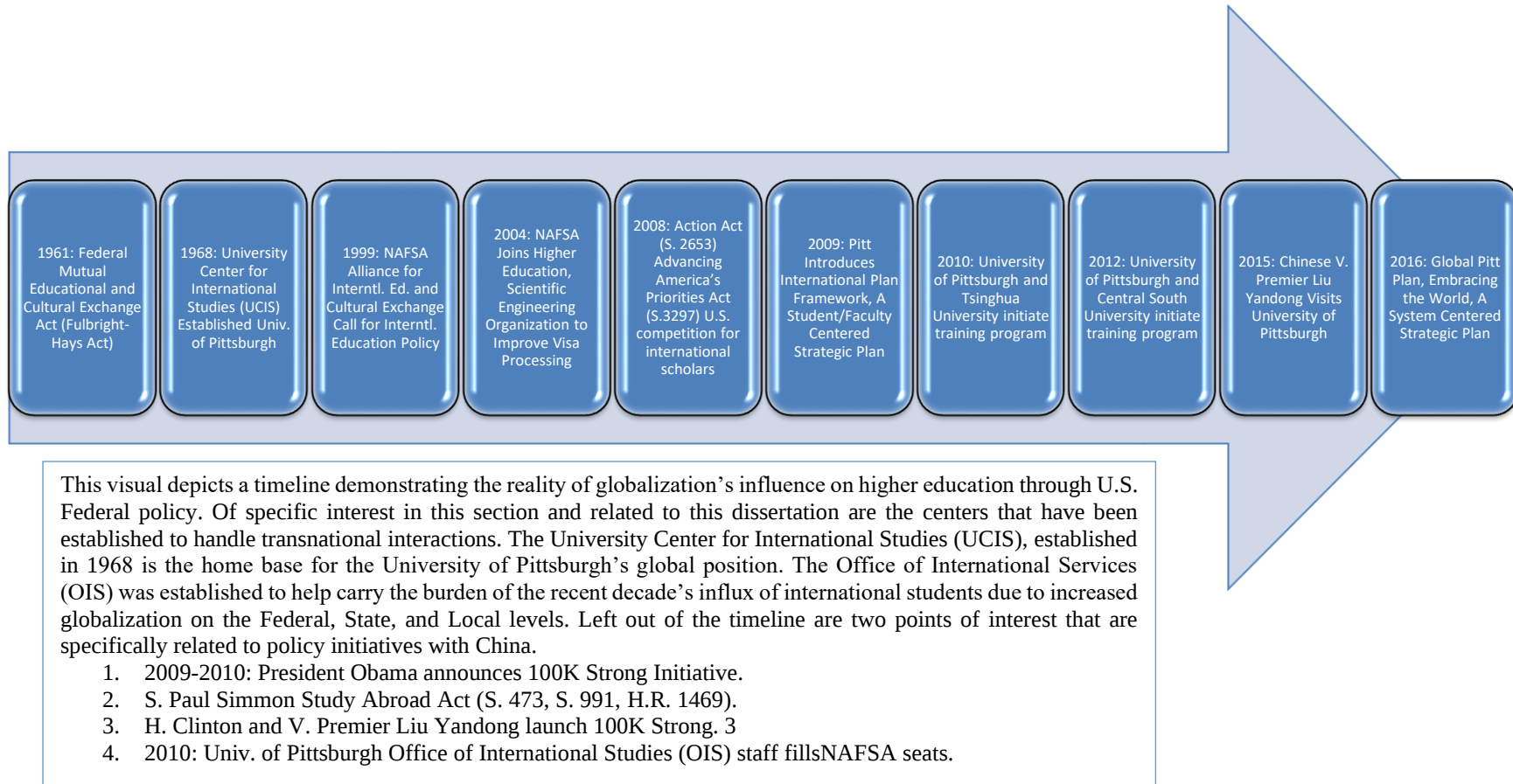


Figure 28 Appendix K Timeline of

Events Leading to the Establishment of Centers for Transnational Interactions at the University of Pittsburgh

**Appendix L SWOB Analysis and Program Goals Tables Showing Coding Strategies, Interview/Survey Questions, and
Corresponding Study Inquiry Questions for each Study Participant Group**

Appendix L.1 Program Strengths

Table 7 Appendix L.1 Program Strengths

Inquiry Question	Associated Interview and Exit Survey Questions	Coding Strategy
1. What practices are in place to advance knowledge sharing and global health education practices in this transnational training program? a. SWOB analysis. b. What knowledge sharing practices have evolved?	<u>Open Ended Exit Survey Questions:</u> 1. My mentor and research supervisors provided me with sufficient feedback on my research performance and progress. 2. This experience has improved my ability to conduct independent research. 3. My technical lab skills have improved through this experience. 4. I am better able to evaluate the scientific work of others because of this experience. 5. Please rate the overall quality of your research training experience at the University of Pittsburgh. 6. What is the best thing about your two-year research training experience in Pittsburgh? 7. To the best of your knowledge, please briefly describe the differences in how research is conducted in China compared to the United States. What is best about the Chinese model? What is best about the American model? 8. Please describe how you think this two-year research training experience will influence your future career as a physician working in China. 9. Please describe how you think this two-year research training experience will influence your future career as a physician working in China. 10. Would you recommend this research training program to other students at your university?	Identifying words and phrases including Likes, Enjoy, Dedicated, Successful, Satisfaction, Strength Direct answers to interview and survey questions about Successes, Satisfaction, and Likes.

Table 7 Appendix L.1 Program Strengths continued

Inquiry Questions	Associated Interview and Exit Survey Questions	Coding Strategy
2. What gaps exist between organizational practice and espoused values? a. What are the emergent needs of the stakeholders? b. How do stakeholders' values align? 3. What does the system look like that supports this training program?	11. My mentor and research supervisors provided me with sufficient feedback on my research performance and progress. 12. This experience has improved my ability to conduct independent research. 13. My technical lab skills have improved through this experience. 14. I am better able to evaluate the scientific work of others because of this experience. 15. Please rate the overall quality of your research training experience at the University of Pittsburgh. 16. What is the best thing about your two-year research training experience in Pittsburgh? 17. To the best of your knowledge, please briefly describe the differences in how research is conducted in China compared to the United States. What is best about the Chinese model? What is best about the American model? 18. Please describe how you think this two-year research training experience will influence your future career as a physician working in China. 19. Would you recommend this research training program to other students at your university? <u>Faculty Interview Questions:</u> 1. Describe your role and position in the transnational visiting scholar training program. 2. Describe for me the process of implementing this transnational training program. Specifically, I would like for you to describe what the process looks like from the time the visiting scholars arrive to the time they leave. 3. Explain how your job requirements and responsibilities have changed since accepting students through the training program? 4. Explain how your job requirements and responsibilities have changed since accepting students through the training program? 5. What about this program brings you the most satisfaction?	Continued from above

Table 7 Appendix L.1 Program Strengths continued

Inquiry Questions	Associated Interview and Exit Survey Questions	Coding Strategy
Continued from above	6. Describe for me how you support the integration of the visiting scholars into your laboratory. 7. Describe for me how or if your laboratory has changed since the visiting scholars joined your lab? 8. The next series of questions involve word association. I am going to say 2-word phrases. Please tell me what comes to mind as they relate to this training program. a. Knowledge sharing b. Skill development 9. What would you hope to learn from this program evaluation? 10. Is there anything you would like to discuss that we may have missed? <u>Visiting Scholar Questions:</u> 1. Describe for me the visiting scholar training program? 2. Describe for me what about this program brings you the most satisfaction. 3. Identify aspects of your experience that you believe to be successful parts of this training program. 4. Identify aspects in the training program that you would like to see developed or improved. 5. Would you like to see anything added to the Methods and Logic course that would help your training experience and your research? 6. Describe for me the integration process into the lab you chose. a. Do you feel you belong to part of the laboratory research team? b. Describe what makes you feel that way?	Continued from above

Table 7 Appendix L.1 Program Strengths continued

Inquiry Questions	Associated Interview and Exit Survey Questions	Coding Strategy
Continued from above	7. Describe ways you believe this program is helping global health education. 8. Describe ways you believe this program is helping global health education? 9. Tell me which form or combination of forms of communication you find to be most helpful: visual, written, auditory. 10. Do you feel satisfied with the knowledge sharing provided in this program, Yes or No? a. Share your perspective on knowledge sharing. b. How would you improve knowledge sharing? 11. List some of the most useful knowledge you obtained while training at the University of Pittsburgh. 12. Do you feel satisfied with the skills you have development through this training program? a. List some of the skills you obtained in this training program at the University of Pittsburgh? b. Of the skills you obtained, which ones do you think are most useful skills for you? 13. Did you join any groups in the local community while you were here? a. If yes, what types? b. If no, what types might you like to have joined? 14. Identify some things you learned from this training program experience. 15. Describe how this training experience has helped you professionally. 16. Describe how this training experience has helped you develop personally. 17. What made you choose the University of Pittsburgh over Melbourne? 18. Is there anything else you would like to add to the discussion?	Continued from above

Table 7 Appendix L.1 Program Strengths continued

Inquiry Questions	Associated Interview and Exit Survey Questions	Coding Strategy
Continued from above	<u>Resident Personnel Focus Group Questions:</u> 1. Describe for me your role with the visiting scholars and their training. 2. Were you told anything about the visiting scholar training program by anyone? 3. Describe for me the integration process of the visiting scholars into your lab. a. Do you feel they belong to part of the laboratory research team? b. Describe what makes you feel that way? 4. Describe for me what about working with and training the visiting scholars brings you the most satisfaction. 5. Identify aspects of your experience working with and training the visiting scholars that you believe to be successful. 6. Tell me which type or combination of types of learning you find most helpful: visual, auditory, written 1. As a learner 2. As a teacher 7. What would have helped support you in the training process in your lab? 8. Describe how this training experience helped you professionally. 9. Describe ways this training experience helped you develop personally. 10. The next series of questions involve word association. I am going to say 2-word phrases. Please tell me what comes to mind as they relate to this training program. a. Knowledge sharing b. Skill development c. Belonging d. Support e. Communication 11. Describe ways you believe this program is helping global health education. 12. Identify some things you learned from this training program experience. 13. Is there anything else you would like to add to this discussion?	Continued from above

Appendix L.2 Program Weaknesses

Table 8 Appendix L.2 Program Weaknesses

Inquiry Question	Associated Interview and Exit Survey Questions	Coding Strategy
1. What practices are in place to advance knowledge sharing and global health education practices in this transnational training program? a. SWOB analysis. b. What knowledge sharing practices have evolved?	<u>Open Ended Exit Survey Questions:</u> 1. My mentor and research supervisors provided me with sufficient feedback on my research performance and progress. 2. This experience has improved my ability to conduct independent research. 3. My technical lab skills have improved through this experience. 4. I am better able to evaluate the scientific work of others because of this experience. 5. Please rate the overall quality of your research training experience at the University of Pittsburgh. 6. What aspect of the two-year research training experience do you think could be improved? 7. To the best of your knowledge, please briefly describe the differences in how research is conducted in China compared to the United States. What is best about the Chinese model? What is best about the American model? 8. Please describe how you think this two-year research training experience will influence your future career as a physician working in China. 9. Would you recommend this research training program to other students at your university?	Identifying words and phrases involving Dislikes, Challenges, Development, Dissatisfaction, Lack of Clarity, Unclear Expectations, Weaknesses. Direct answers to interview and survey questions about Improvements, Changes, Developments, and Dislikes.
2. What gaps exist between organizational practice and espoused values? a. What are the emergent needs of the stakeholders?	<u>Faculty Interview Questions:</u> 1. Describe your role and position in the transnational visiting scholar training program. 2. In a few words or more how would you describe this visiting scholar training program? I would like for you to describe what the process looks like from the time the visiting scholars arrive to the time they leave.	

Table 8 Appendix L.2 Program Weaknesses continued

Inquiry Question	Associated Interview and Exit Survey Questions	Coding Strategy
b. How do stakeholders' values align? 3. What does the system look like that support this training program?	3. What does the system look like that supports this training program? 4. Explain how your job requirements and responsibilities have changed since accepting students through the training program, or have they? 5. Identify areas in the training program that you would like to see developed or improved. 6. Describe for me how or if your laboratory has changed since the visiting scholars joined your lab? 7. The next series of questions involve word association. I am going to say 2-word phrases. Please tell me what comes to mind as they relate to this training program. a. Knowledge sharing b. Skill development c. Communication 8. What would you like to see added, if anything, to the Visiting Scholar's course work that could help facilitate the lab experience and training process? 9. Is there any aspect of a program evaluation that you would find most beneficial to know about? 10. Is there anything you would like to discuss that we may have missed? <u>Visiting Scholar Questions:</u> 1. Describe for me the visiting scholar training program? 2. Identify aspects in the training program that you would like to see developed or improved. 3. Describe for me your experience with the Methods and Logic course. 4. Would you like to see anything added to the Methods and Logics course that would help your training experience and your research? 5. Describe for me the integration process into the lab you chose. a. Do you feel you belong to part of the laboratory research team?	Continued from above

Table 8 Appendix L.2 Program Weaknesses continued

Inquiry Question	Associated Interview and Exit Survey Questions	Coding Strategy
Continued from above	b. Describe what makes you feel that way? 6. How could we have helped support you more in the lab? 7. Identify development or changes in the program you would recommend to advance global health education. 8. Did you join any groups in the local community while you were here? a. If yes, what types? b. If no, what types might you like to have joined? 9. Tell me which form or combination of forms of communication you find to be most helpful: visual, written, auditory. 10. Identify some things you learned from this training program experience. 11. Do you feel satisfied with the knowledge sharing provided in this program, Yes or No? 12. Share your perspective on knowledge sharing. 13. How would you improve knowledge sharing? 14. List some of the most useful knowledge you obtained while training at the University of Pittsburgh. 15. Do you feel satisfied with the skills you have development through this training program? a. List some of the skills you obtained in this training program at the University of Pittsburgh? b. Of the skills you obtained, which ones do you think are most useful skills for you? 16. Describe how this training experience has helped you professionally. 17. Describe how this training experience has helped you develop personally. 18. What made you choose the University of Pittsburgh over Melbourne? 19. Is there anything you would like to add to this discussion?	Continued from above

Table 8 Appendix L.2 Program Weaknesses continued

Inquiry Question	Associated Interview and Exit Survey Questions	Coding Strategy
Continued from above	<u>Resident Personnel Focus Group Questions:</u> 1. Describe for me your role with the visiting scholars and their training. 2. Were you told anything about the visiting scholar training program by anyone? 3. Describe for me the integration process of the visiting scholars into your lab. a. Do you feel they belong to part of the laboratory research team? b. Describe what makes you feel that way? 4. Identify aspects in your experience working with and training the visiting scholars that you found to be difficult. How would you develop or improve these things? 5. What would have helped support you in the training process in your lab? 6. Describe how this training experience has helped you professionally. 7. Describe ways this training experience helped you develop personally. 8. The next series of questions involve word association. I am going to say 2-word phrases. Please tell me what comes to mind as they relate to this training program. a. Knowledge sharing b. Skill development c. Belonging d. Support e. Communication 9. Identify developments or changes in the program you would recommend to advance global health education 10. Describe ways you believe this program is helping global health education. 11. Identify some things you learned from this training program experience. 12. Is there anything else you would like to add to this discussion?	Continued from above

Appendix L.3 Program Opportunities

Table 9 Appendix L.3 Program Opportunities

Inquiry Question	Associated Interview and Exit Survey Questions	Coding Strategy
1. What practices are in place to advance knowledge sharing and global health education practices in this transnational training program?	<u>Open Ended Exit Survey Questions:</u> 1. To the best of your knowledge, please briefly describe the differences in how research is conducted in China compared to the United States. What is best about the Chinese model? What is best about the American model? 2. Please describe how you think this two-year research training experience will influence your future career as a physician working in China. 3. Would you recommend this research training program to other students at your university?	Identifying words and phrases including Vision, Wishes, Possibilities, Wants/Desires
a. SWOB analysis.		Direct answer to questions about Opportunities and Comparisons
b. What knowledge sharing practices have evolved?	<u>Faculty Interview Questions:</u> 1. Describe for me the visiting scholar training program and how you became a part of it. 2. Describe for me the process of implementing this transnational training program. Specifically, I would like for you to describe what the process looks like from the time the visiting scholars arrive to the time they leave. 3. Describe for me how you support the integration of the visiting scholars into your laboratory. 4. What about this program brings you the most satisfaction? 5. Describe for me how or if your laboratory has changed since the visiting scholars joined your lab? 6. What would you hope to learn from this program evaluation? 7. Is there anything you would like to discuss that we may have missed?	
2. What gaps exist between organizational behaviors and espoused values?		
a. What are stakeholder's espoused values?		

Table 9 Appendix L.3 Program Opportunities continued

Inquiry Question	Associated Interview and Exit Survey Questions	Coding Strategy
b. How do stakeholders' values align?	<u>Visiting Scholar Questions:</u> 1. Describe for me the visiting scholar training program? 2. Identify aspects of your experience that you believe to be successful parts of this training program. 3. How could we have helped support you more in the lab? 4. Describe ways you believe this program is helping global health education. 5. Identify developments or changes in the program you would recommend to advance global health education. 6. Did you join any groups in the local community while you were here? a. If yes, what types? b. If no, what types might you like to have joined? 7. Describe how this training experience has helped you professionally. 8. Describe how this training experience has helped you develop personally. 9. What made you choose the University of Pittsburgh over Melbourne? 10. Is there anything you would like to add to this discussion?	Continued from above
3. What does the system look like to support the training program?	<u>Resident Personnel Focus Group Questions:</u> 1. Describe for me your role with the visiting scholars and their training. 2. Describe for me the integration process of the visiting scholars into your lab. 3. Do you feel they belong to part of the laboratory research team? Describe what makes you feel that way? 4. What would have helped support you in the training process in your lab? 5. Describe how this training experience helped you professionally. 6. Describe ways this training experience helped you develop personally. 7. Describe ways you believe this program is helping global health education. 8. Identify developments or changes in the program you would recommend to advance global health education.	

Table 9 Appendix L.3 Program Opportunities continued

Inquiry Question	Associated Interview and Exit Survey Questions	Coding Strategy
Continued from above	9. Describe ways you believe this program is helping global health education. 10. Identify developments or changes in the program you would recommend to advance global health education. 11. Identify some things you learned from this training program experience. 12. Is there anything else you would like to add to this discussion?	Continued from above

Appendix L.4 Program Barriers

Table 10 Appendix L.4 Program Barriers

Inquiry Question	Associated Interview and Exit Survey Questions	Coding Strategy
1. What practices are in place to advance knowledge sharing and global health education practices in this transnational training program? a. SWOB analysis b. What knowledge sharing practices have evolved?	<u>Open Ended Exit Survey Questions:</u> 1. My mentor and research supervisors provided me with sufficient feedback on my research performance and progress. 2. This experience has improved my ability to conduct independent research. 3. My technical lab skills have improved through this experience. 4. I am better able to evaluate the scientific work of others because of this experience. 5. To the best of your knowledge, please briefly describe the differences in how research is conducted in China compared to the United States. What is best about the Chinese model? What is best about the American model? 6. Please describe how you think this two-year research training experience will influence your future career as a physician working in China. 7. Would you recommend this research training program to other students at your university?	Responses including Limitations, Difficulties, Challenges that affect Program Sustainability Direct answer to questions about Barriers and Boundaries
2. What gaps exist between organizational practice and espoused values? a. What are stakeholders' espoused values?	<u>Faculty Interview Questions:</u> 1. Describe your role and position in the transnational visiting scholar training program. 2. Describe for me the process of implementing this transnational training program. Specifically, I would like for you to describe what the process looks like from the time the visiting scholars arrive to the time they leave.	

Table 10 Appendix L.4 Program Barriers continued

Inquiry Question	Associated Interview and Exit Survey Questions	Coding Strategy
b. How do stakeholders' values align?	3. Explain how your job requirements and responsibilities have changed since accepting students through the training program. 4. Describe for me how or if your laboratory has changed since the visiting scholars joined your lab?	Continued from above
3. What does the system look like supporting this training program?	5. Describe how and to whom you communicate ideas you have about the training program. 6. What would you like to see added, if anything, to the Visiting Scholar's MLB course work that could help facilitate the lab experience and training process? 7. Describe any boundaries you may have regarding intellectual property or intellectual rights or does that matter to you? 8. What would you hope to learn from this program evaluation? 9. Is there anything you would like to discuss that we may have missed? <u>Visiting Scholar Questions:</u> 1. Describe for me the visiting scholar training program? 2. Describe for me your experience with the Methods and Logic course. 3. Describe for me the integration process into the lab you chose. a. Do you feel you belong to part of the laboratory research team? b. Describe what makes you feel that way? 4. How could we have helped support you more in the lab? 5. Identify development or changes in the program you would recommend to advance global health education. 6. Identify some things you learned from this training program experience. 7. Describe how this training experience has helped you professionally. 8. Describe how this training experience has helped you personally.	

Table 10 Appendix L.4 Program Barriers continued

Inquiry Question	Associated Interview and Exit Survey Questions	Coding Strategy
Continued from above	9. What made you choose the University of Pittsburgh over Melbourne? 10. Is there anything you would like to add to this discussion? <u>Resident Personnel Focus Group Questions:</u> 1. Describe for me your role with the visiting scholars and their training. 2. Describe for me the integration process of the visiting scholars into your lab. a. Do you feel they belong to part of the laboratory research team? b. Describe what makes you feel that way? 3. Identify aspects in your experience working with and training the visiting scholars that you found to be difficult. 4. How would you develop or improve these things? 5. Describe how this training experience helped you professionally. 6. Describe ways this training experience helped you develop personally. 7. Describe any boundaries you have regarding intellectual rights or intellectual property, or does that even matter to you? 8. Identify developments or changes in the program you would recommend to advance global health education. 9. Identify some things you learned from this training program experience. 10. Is there anything else you would like to add to this discussion?	Continued from above

Appendix L.5 Program Goals

Table 11 Appendix L.5 Program Goals

Inquiry Question	Associated Interview and Exit Survey Questions	Coding Strategy
1. What practices are in place to advance knowledge sharing and global health education practices in this transnational training program? a. What are the goals?	<u>Open Ended Exit Survey Questions:</u> 1. Please list three learning goals that you had during your two-year research experience at the University of Pittsburgh. 2. I achieved my learning goals. <u>Faculty Interview Questions:</u> 1. Describe for me the process of implementing this transnational training program. Specifically, I would like for you to describe what the process looks like from the time the visiting scholars arrive to the time they leave. 2. Describe for me how you support the integration of the visiting scholars into your laboratory. 3. What would you like to see added, if anything, to the Visiting Scholar's course work that could help facilitate the lab experience and training process? 4. How do you define productivity? 5. Is there anything else you would like to add to this discussion?	Identifying words and phrases including Expectations, Goals, Objectives, Desired achievements, English
2. What gaps exist between organizational practice and espoused values? a. What are the emergent needs of the stakeholders? b. How do stakeholders' values align?	<u>Visiting Scholar Questions:</u> 1. Describe for me the visiting scholar training program? 2. Would you like to see anything added to the Methods and Logics course that would help your training experience and your research? 3. Describe how this training experience has helped you develop professionally. 4. Describe how this training experience has helped you develop personally. 5. How do you define productivity? 6. Is there anything else you would like to add to this discussion?	

Table 11 Appendix L.5 Program Goals

Inquiry Question	Associated Interview and Exit Survey Questions	Coding Strategy
Continued from above	<u>Resident Personnel Focus Group Questions:</u> 1. Describe for me your role with the visiting scholars and their training. 2. Describe for me the integration process of the visiting scholars into your lab. 3. Describe how this training experience helped you professionally. 4. Describe ways this training experience helped you develop personally. 5. How do you define productivity? 6. Is there anything else you would like to add to this discussion?	Continued from above

**Appendix M Reconstructed Visiting Scholar Exit Interview Survey, Designed and
Conducted by Personnel from the University of Pittsburgh School of Medicine**

**Table 12 Appendix M Reconstructed Visiting Scholar Exit Interview Survey, Designed and Conducted by
Personnel from the University of Pittsburgh School of Medicine**

Question	Response Type
Full Name	Open ended
What Medical School do you attend in China?	Open ended
Please list three learning goals that you had during your two-year research experience at the University of Pittsburgh.	Open ended
I achieved my learning goals.	Selection range: Disagree to Strongly Agree
My mentor and research supervisors provided me with sufficient feedback on my research performance and progress.	Selection range: Disagree to Strongly Agree
Please comment on your rating	Open ended
This experience has improved my ability to conduct independent research.	Selection range: Disagree to Strongly Agree
Please comment on your rating	Open ended
My technical lab skills have improved through this experience.	Selection range: Disagree to Strongly Agree
Please comment on your rating	Open ended
I am better able to evaluate the scientific work of others because of this experience.	Selection range: Disagree to Strongly Agree
Please comment on your rating	Open ended
Please rate the overall quality of your research training experience at the University of Pittsburgh.	Selection range drop down menu
Please comment on your rating	Open ended

**Table 12 Appendix M Reconstructed Visiting Scholar Exit Interview Survey, Designed and Conducted by
Personnel from the University of Pittsburgh School of Medicine (continued)**

Please provide references for all articles accepted/published in peer-reviewed journals on which you were an author during your time in Pittsburgh.	Open ended
Please list all of your presentations/posters at scientific conferences during your time in Pittsburgh.	Open ended
What was the best thing about your two-year research training experience in Pittsburgh?	Open ended
What aspect of the two-year research training experience do you think could be improved?	Selection range drop down menu
To the best of your knowledge, please briefly describe the differences in how research is conducted in China compared to the United States. What is best about the Chinese model? What is best about the American model?	Open ended
Please describe how you think this two-year research training experience will influence your future career as a physician working in China.	Open ended
Would you recommend this research training program to other students at your university?	Open ended

Appendix N Institutional Review Board (IRB) Approval Letter

University of Pittsburgh Institutional Review Board

Human Research Protection Office
3500 Fifth Avenue, Suite 106
Pittsburgh, PA 15213
Tel (412) 383-1480
www.hrpo.pitt.edu

NOT RESEARCH

Date:	June 5, 2020
Review Type:	Initial Study
IRB:	STUDY20050340
PI:	Lauryn Kohut
Title:	An Evaluation of a Transnational Biomedical Research Training Program Advancing the Growing Practice of Global Health Education
Funding:	None
Documents Reviewed:	• LKohut Script, Category: Data Collection; • LKohut Exemption 45CRF, Category: IRB Protocol; • LKohut Introductory Script, Category: IRB Protocol; • LKohut Script, Category: Recruitment Materials; • LKohut Script, Category: Consent Form; • LKohut-short form consent-English, Category: Consent Form; • LKohut-short form consent-Mandarin, Category: Consent Form;

The Institutional Review Board (IRB) determined that the proposed activity is not research as defined by DHHS and FDA regulations.

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these activities are research involving human in which the organization is engaged, please submit a new request to the IRB for a determination. You can create a modification by clicking **Create Modification / CR** within the study.

If you have any questions, please contact the University of Pittsburgh IRB Coordinator, [Amy Fuhrman](#).

Please take a moment to complete our [Satisfaction Survey](#) as we appreciate your feedback.

Appendix O University of Pittsburgh School of Medicine Framework for Diversity

The University of Pittsburgh School of Medicine (UPSOM) has been and remains committed to diversity and inclusion across a broad spectrum of characteristics and issues. At UPSOM diversity encompasses and explores the dimensions of race, ethnicity, language, gender, sexual orientation, gender identity, social and economic status, age, physical ability, religion and experience. Since 1967 the UPSOM has sustained a strategic emphasis on increasing participation of U. S. underrepresented minorities (African-Americans, Hispanics, Native Americans, Native Hawaiians/Pacific Islanders, and Native Alaskans) in clinical medicine, biomedical research, teaching and service. Accordingly, programs, initiatives and areas of focus have been developed to implement that commitment and maximize the benefits of diversity and inclusion in all aspects of our activities.

Mission

The mission of the University of Pittsburgh School of Medicine is to improve the health and well-being of individuals and populations through cutting-edge biomedical research, innovative educational programs in medicine and biomedical science, and leadership in academic medicine. We strive to implement this mission with the highest professional and ethical standards, in a culture of diversity and inclusiveness, and in an environment that enables each individual to develop to their fullest potential.

Vision

The University of Pittsburgh School of Medicine (UPSOM) will achieve and sustain excellence in exceeding the Association of American Medical Colleges (AAMC), Liaison Committee on Medical Education (LCME) and the Sullivan Commission's diversity and inclusion goals and expectations for enrollment, graduation, research, education, climate, community engagement and service.

Scope

In our environment, diversity and inclusion are valued, broadly defined and pedagogically supported. Our persistent attention to diversity and inclusion is mission driven. We believe at their core diversity and inclusion stimulates the cultural competencies that enhance clinical effectiveness, inform research and result in effective interaction in cross cultural situations. Our goal is to make certain our students and graduates provide the best and most appropriate care to their patients. We are also

concerned about diversity in the physician workforce and the disparities in access to care and medical outcomes for underserved populations.

The following areas of focus build our capacity to develop, implement and assess our diversity and inclusion policies, initiatives and activities:

1. Develop a common understanding and commitment to valuing, achieving and celebrating diversity and Inclusion Initiatives:
 - Distribute School mission and definition of diversity
 - Publish the Framework on the School web-site
 - Provide the Framework to new students at Orientation
2. Create and sustain a welcoming climate and a sense of community for students, faculty and staff. Initiatives:
 - Annually assess and describe the climate
 - Profile minority students, alumni, faculty, residents, fellows and staff in department literature
 - Recognize those who have contributed to achieving department and UPSOM diversity goals
3. Recruit, retain and graduate a diverse student body that is competent, compassionate and committed to service and understands health care in a contemporary social context. Initiatives:
 - Describe the UPSOM population according to the School definition of diversity
 - Formalize a transition program to assist URM students in making a smooth transition to University of Pittsburgh, the School of Medicine (SOM) and Pittsburgh
 - Develop networking and mentoring programs that introduce URM students to each other, other graduate and professional students, SOM local alumni, local physicians, UPMC residents, fellows, SOM faculty and SOM administration
 - Facilitate a professional development program that provides URM students with mentors, a career plan, leadership development and awareness of health care in a contemporary social context
 - Develop a recognition program for student community outreach efforts
4. Recruit, develop and retain a diverse academic and administrative workforce. Initiatives:
 - Collaborate in the development of affinity faculty groups that facilitate networking opportunities for students, faculty, fellows, residents, graduate students, postdocs and local alumni
 - Ensure the materials and discussions during the search process identify the scope of the School's commitment to diversity
 - Develop a diversity search strategy that can be shared by all departments
 - Ensure health disparity issues are incorporated into any relevant research
 - Identify resources for a vertical accountability process so that attaining and sustaining

diversity is a key dimension of performance for all faculty managers

5. Ensure that the curriculum content considers contemporary social issues facing medicine and that it fosters inter-cultural and intracultural insight. Initiatives:
 - Increase faculty participation in the Provost Diversity Fellows Program
 - Infuse cultural competence and diversity into the curriculum as appropriate (PBL, TBL, standardized patients, elective and Area of Concentration (AOC) courses
 - Ensure graduates understand health disparities in the contemporary social context of medicine
 - Utilize the Diversity Workshop to introduce MS1s to the diversity and inclusion concepts that will be reinforced throughout the curriculum
6. Encourage research activities be linked to the investigation of the health disparities facing medicine locally, nationally and globally
7. Recruit, develop and retain diverse leadership committed to diversity and inclusion in education, research, service and clinical practice
8. Develop collaborative outreach programs and partnerships at the precollege and pre-medical levels. Initiatives:
 - Strengthen existing pipeline programs, Health Careers Exploration Institute and Pre-medical Organization for Minority Students (P.O.M.S)
 - Effective utilization of SPAEP and Prologue programs to increase UPSOM enrollment
 - Collaborate with the local school districts in the development of programs and initiatives that enhance the access to medicine and medical careers
9. Facilitate organizational change that supports and sustains a commitment to racial, ethnic, gender diversity
10. Provide accessibility and accommodations to individuals with disabilities
11. Provide great insight into the health experiences of our LGBTQIA community through education mentoring and research.

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