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UNDERSTANDING ACADEMIC PIPELINE PROGRAMS AND THEIR ORIGINS

It's hard to be what you can't see.
    —Marian Wright Edelman, http://www.Childrensdefense.org/ch
        ild-watch-columns/health/2015/its-hard-to-be-what-you-cant
                                                                    -see/

Plotting a course through today's higher-education system and workplaces can be challenging for those who have not seen a pathway successfully navigated by someone else. All of us need assistance with our academic and career journeys. However, certain groups are less likely to receive this assistance without formalized programming and equitable systems in place. *Academic Pipeline Programs: Diversifying Pathways from the Bachelor's to the Professoriate* provides a spotlight on programs supporting diverse populations along their academic and career journeys. Diversity, equity, and inclusion (DEI) programming is critical given the underrepresentation of certain individuals in academia and the workplace. Particularly within the United States, underrepresentation in

certain academic disciplines, coupled with the fact that 56 percent of college-bound persons are first generation (RTI International, 2019),[1] makes academic pipeline programs necessary. As a reader, one might find themselves fitting into one of several categories: (1) someone who wants to become more aware of academic pipeline programs and how to enroll, (2) someone mentoring those in the pipeline, or (3) someone who is in training to create, implement, or coordinate programs at an institution or organization.

Regardless of how a reader identifies, the rationale for the existence of academic pipeline programs at the beginning of this chapter will be useful. Later in the chapter, our newly developed index tool (THRIVE), is described to thoroughly understand each program, and this instrument is given context by the Appreciative Inquiry (AI) framework (Byrd, 2016; Cooperrider & Srivastva, 1987). For this chapter, we also use the seven dimensions of the THRIVE Index tool to provide an introductory review of academic pipeline programs and their components.

Unfortunately, in the twenty-first century, we still have many populations who live in marginalized worlds, without the same opportunities as their majority counterparts. High school and college students from low-income and first-generation (LIFG) families tend to graduate at lower rates than those from more affluent families. If one's background is LIFG and they identify as an underrepresented minority (URM) (e.g., African American, Hispanic American, Native American, Pacific Islander) or marginalized in the academy due to a host of factors (e.g., gender, gender expression, sexual orientation, dis[ability], age, language use, foreign-birth status, socioeconomic status, veteran status, etc.), then the likelihood of not succeeding in college or beyond increases (Perna, 2015).[2] The educational pipeline has many barriers for LIFG, URMs,

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1. Websites are provided in appendix B for all hyperlinked programs and initiatives.

2. Although there are varying viewpoints on the term *minorities*, for this document, the word *minority* is used to provide context to underrepresentation in the

and other marginalized groups. These groups are often left out of conversations about procedures and policies in higher education or about financial opportunities that could support them obtaining a degree. Further, these students often are not aware of the nuances of academic research, expected behaviors, and cultural norms of higher education, as keys to opening the door to degree completion. Consistent monitoring, advisement, mastery of knowledge development, hands-on research experiences with faculty, and support networks provided by academic pipeline programs are all essential components of collegiate success for these underserved populations (Maton & Hrabowski, 2004).

Pipeline programs have successfully assisted LIFG and URM students in completing their academic journey via several core components. Academic pipeline programs offer a variety of services, such as test preparation; tutoring; specific skill training; college, graduate, and professional school or faculty preparation and exposure; research opportunities; enrichment programs and activities; mentoring; and supplemental instruction and summer training programs (Schultz et al., 2011). This book aids readers with finding academic pipeline programs and evaluating whether a program fits their needs. Even though our hallmark programs have been successful in their training efforts, some are experiencing growing pains.

The systems and policies of academic pipeline programs are being scrutinized to ensure that inequitable behaviors and practices are eradicated and that their structures are keeping in step with the rate of browning of the nation and numbers of LIFG students entering the academy. The academic pipeline programs mentioned in this book are not immune from this scrutiny. Given their historical underpinnings and funding sources, there is also

academy and the workplace. The term *underrepresented minority* is also still currently used by programs. We understand that other terms, like *underrepresented group* (URG) and *BIPOC* (Black, Indigenous, and people of color), have been more recently used to describe the populations we describe.

the ongoing need for academic pipeline programs to engage in self-evaluation and continuous improvement to remain true to their mission. These initiatives have been empowered through the engagement of alumni of pipeline programs challenging program policies and decision-making processes. For example, it has become more publicly apparent that some of our highlighted programs need transformation. Transformation has arisen from the of work Knowledge Is Power Program (KIPP) alumni who self-organized to rally for changes in program leadership. In fact, KIPP has also been more intentional about working with more diverse groups in institutions to transition students into college, such as working with many minority-serving institutions (e.g., historically Black colleges and Universities [HBCUs], Hispanic-serving institutions [HSIs]). The Ford Foundation Fellowship Program was another initiative recently challenged by its alumni to create better policies and practices related to fairness and equity, not only within its leadership but for the broader academy. Ultimately, as effective as these programs are in diversifying the academy, they will always need to be accountable to the populations they serve.

THRIVE INDEX

We created the THRIVE Index as a common framework to compare programs, highlighting their strengths and introducing a unique set of parameters to contextualize each program. The THRIVE Index provides an objective and comprehensive lens into each program, so one can determine if an initiative fits their need(s). Throughout the book, the THRIVE Index also serves as a tool for evaluating how academic pipeline programs promote the academic and social development of participants that is beneficial for program replication and sustainability. The THRIVE acronym stands for type, history, research, inclusion/identity, voice, and expectations (see figure 1.1). The THRIVE Index illustrates the value of each program, showcasing its longevity and usefulness

to those navigating their academic and career journeys. The THRIVE Index also captures common-core features of academic pipeline programs (Schultz et al., 2011), which are demonstrated to impact underserved populations in the United States across seven dimensions.

THRIVE Index Defined

Type (T): where the pipeline program is structurally situated among its peers

History (H): what context, milestones, longevity, and educational outcomes have been achieved

Research (R): which research preparation program components are utilized by programs (roles, responsibilities, routines)

Inclusion/Identity (I): how the programs are used to create inclusion on campuses, programs and organizations as well as build identity among participants

Voice (V): how each program creates a positive environment for students and faculty to enhance their voice by overcoming barriers to enter the academy

Expectations (E): what participants receive and what program outcomes are available

The THRIVE Index went through a multistage validation process. A panel of expert reviewers (two academics with assessment-development experience and an academic pipeline program director) reviewed the items for readability and face validity. These experts offered feedback for the refinement of items. We retained twenty-two questions, which were given to the program directors of each of the hallmark programs featured in the book. Once we completed the analysis of the responses, we refined the THRIVE Index to include additional multiple-choice responses so that it would be possible to compare programs and look for similarities in best practices.

Type   History   Research   Inclusion/Identity   Voice   Expectation
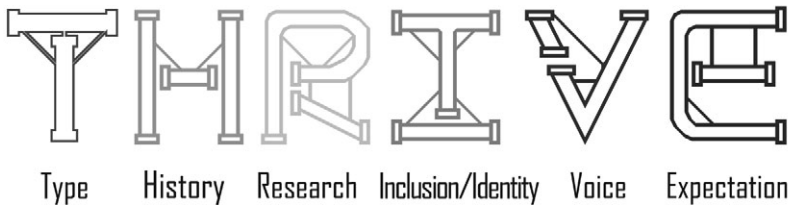
Figure 1.1. The THRIVE logo.

We were able to investigate these initiatives and their organizations by framing our THRIVE Index tool questions using the Appreciative Inquiry (AI) intervention tool. AI is one of the methodologies of organizational development that advances new ideas for change by looking at the best of the collective to provide emerging interventions and recommendations (Bushe & Kassam, 2005). The THRIVE Index mirrors the AI cycle by allowing organizations the ability to imagine, empower, and illustrate the best version of themselves through their responses (Cooperrider et al., 1987). Our index tool reveals the positive possibilities of academic pipeline programs by showing their generative, strength-based programming for which AI is best known. The AI model situates and nicely frames our THRIVE Index by contextualizing each letter of our acronym through the AI 4-D model of discovery, dream, design, and destiny (see figure 1.2). Later, we will discuss THRIVE and the cycles of AI to create a rubric toward institutional change and inclusive excellence. The concept of inclusive excellence is based on lasting and successful change that fully integrates DEI into strategic planning, policies, systems, and curricula in order to create a complete cultural shift toward belongingness and community (Williams & Wade-Golden, 2013). Using each of the seven dimensions of THRIVE, we unpack the who, what, and why of academic pipeline programs for the remainder of the chapter.
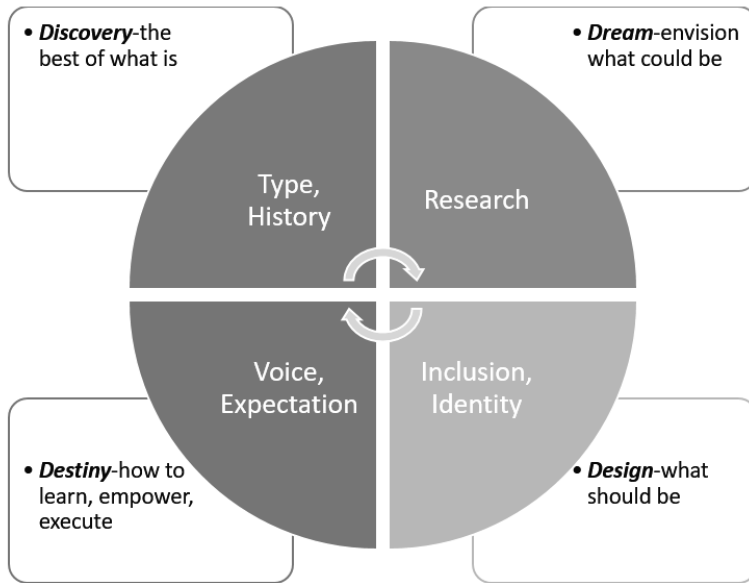
Figure 1.2. AI framework mapped onto THRIVE dimensions.

Types of Pipeline Programs

The first dimension of THRIVE *T* refers to the type of program. Academic pipeline programs are packaged in many modes, frameworks, and styles. Typically, the common denominator between programs is the goal to support each person's advancement from one level of the academy to another. Although each pipeline program may vary in its scope or how it is administered, we have characterized the type of program based on several characteristics, including where a program is situated within an institutional structure, the institutions served, the types of students served, affiliated disciplines, and funding sources. Our research has allowed us to contextualize academic pipeline programs for the content of this book.

Types of academic pipeline programs can be sorted across several categories. The first category of programs serves only those at

the host school or organization (e.g., course-based undergraduate research education [CURE], bridge programs, and enrichment programs, etc.). The second category of programs serves multiple sites nationally (e.g., government or privately funded initiatives). A subset of programs in this category are specific to institution type, such as minority serving institutions (i.e., HBCUs, HSIs, Tribal colleges and universities [TCUs], and Asian American, Native American, and Pacific Islander-serving institutions [AANAPISIs]) (Rutgers Graduate School of Education, 2014). By understanding the various types of programs, one will understand where the program is situated and be able to provide students with the ability to readily locate an initiative among others.

Further, determining the type of program will allow institutions the ability to apply for various awards that fit their needs. Examples of pipeline programs supported by governmental agencies include the National Science Foundation ADVANCE: Organizational Change for Gender Equity in STEM Academic Professions, the National Institutes of Health Research Initiative for Scientific Enhancement (NIH-RISE), the Health and Human Services Health Careers Opportunities Program, and the United States Department of Education Federal TRIO (TRIO) Programs. Examples of privately funded programs are the Mellon-Mays Undergraduate Fellowship Program and Alfred P. Sloan Research Fellowships.

The third category of programs are feeder programs between institution types (e.g., community colleges to four-year institutions, four-year institutions to doctoral-granting institutions, four-year institutions to professional schools). Additionally, there are pipeline programs independently serving broad audiences of underrepresented groups via specialized curricula (e.g., Science Education Alliance-Phage Hunters Advancing Genomics and Evolutionary Science [SEA-PHAGES]) or professional-development resources (e.g., the Annual Biomedical Research Conference for Minority Students [ABRCMS], the Society for Advancement of Chicanos/Hispanics and Native Americans in Science [SACNAS]).

Academic pipeline programs are also structurally arranged as interinstitutional partnerships to promote pathways to advancing academic study, scholarship, and research among diverse students. Partnerships allow students to transition from various undergraduate programs (two-year to four-year programs) and on to graduate and professional programs. Because small and mid-sized private colleges and universities enroll a higher proportion of LIFGs than public and private doctoral universities (Rine, 2015), interinstitutional partnerships are critical. Through interinstitutional partnerships (e.g., the University of California system; the Five College Consortium of Amherst College, Hampshire College, University of Massachusetts, Mount Holyoke College, and Smith College), students and faculty can gain access to additional resources and networks. Examples of academic pipeline programs also configured as consortia are the Louis Stokes Alliance for Minority Participation (LSAMP), the Leadership Alliance, and Alliances for Graduate Education and the Professoriate (AGEP).

HISTORY OF PIPELINE PROGRAMS

The second dimension of THRIVE, *H*, refers to the history of a program. For over fifty years, academic pipeline programs in the United States have been available to students at all levels of their academic career, including precollegiate, collegiate, graduate/professional, postdoctoral, and, most recently, faculty. The origins of programs focused on diverse groups date back the early 1900s. With an initial $1 million donation from John D. Rockefeller Sr. in 1903, the General Education Board (GEB) dedicated their mission to "promotion of education within the United States of America, without distinction of race, sex, or creed" (Fleming & Saslaw, 1992). The GEB examined the racial conditions of schools, evaluated and reformed medical colleges, implemented agricultural teaching demonstrations, and funded grants for conferences, fellowships, as well as black colleges, during the Great Depression. Before the GEB

closed, it had a wide touch with educational programs, including rural elementary schools and colleges, as well as elite graduate institutions. John D. Rockefeller II continued his family's philanthropic legacy by partnering with the former president of Tuskegee University Frederick Douglass Patterson to form the United Negro College Fund (UNCF), an alliance to fund HBCUs.

Perhaps the oldest and now the largest precollegiate program known for assisting with academic persistence is the Boys & Girls Clubs of America (https://www.bgca.org/about-us/annual-report), formerly the Federated Boys Club. The Federated Boys Club was integrated as early as 1903, with reading rooms and vocational training accessible to black boys. Now the mission of the Boys & Girls Clubs of America is to inclusively serve young people to reach their full potential by implementing a variety of initiatives geared toward education and workforce readiness. Located in urban and rural areas, on military bases, and on native lands, Boys & Girls Clubs serve millions of youth annually through enrichment programming to prevent summer learning loss, enrich basic skills in middle school through tutoring, and prepare high schoolers for postsecondary education.

The Social Science Research Council (SSRC), founded in 1923, supports early scholars through fellowships, convenings, professional development, and mentorship. For more than ninety years, the SSRC has furthered the scholarship of those associated with the following disciplines: anthropology, economics, history, political science, psychology, sociology, and statistics. Ralph Bunche, a Nobel Peace Prize recipient, received a SSRC fellowship to complete his postdoctoral studies in anthropology. The SSRC encourages cross-disciplinary collaboration and innovation, as well as the promotion of unbiased voices to serves as policy makers worldwide. Some of their fellowships support recipients of other pipeline programs, like Mellon Mays (see chapter 3) and the Alfred P. Sloan Fellows (see chapter 4). During the same moment in the 1920s, Julius Rosenwald provided funding to start schools in black

communities, funding for graduate-level university centers at HBCUs, funding for fellowships for African American artists, and grants for African American scientists (Beilke, 1997).

Another initiative among the first to provide programming and funding opportunities to support historically URMs, including HBCUs, was the Alfred P. Sloan Foundation. Specifically, the Sloan Foundation supported the Tuskegee Institute and UNCF, as others did in the early 1900s. In the 1950s and 1960s, the Sloan Foundation supported over twenty HBCUs, with an "institutions matter" motto. In the 1970s and 1980s, the Sloan Foundation took a more "money matters" approach, supporting URM students with fellowship programs going to medical school and into STEM disciplines. They financially supported other initiatives, such as the National Action Council for Minorities in Engineering (NACME) and the GEM Consortium, another program highlighted in this book. Suffice to say, the Sloan Foundation has been a pillar in the development of academic pipeline programs in the United States and is described in more detail later.

The next movement of pipeline initiatives happened in the 1960s. Many of the pipeline programs used by URMs today had their origins in the development of community colleges in 1960, based on the 1947 President's Commission on Higher Education (Gilbert & Heller, 2013). Community colleges were developed to assist with the preparation for and transition into four-year colleges, to provide affordable education, and to offer associate degrees or practical skills for employment (US Department of Homeland Security, 2012). The collegiate programming pathway continued with the creation of Title IV of the Higher Education Act of 1965. This legislation created student financial assistance in the form of Pell Grants, Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR-UP), and TRIO Programs (Burke, 2014). These programs set the foundation for traditional pipeline programs, which support marginalized groups around the country. Programs such as the original TRIO Programs, Upward

Bound, Talent Search, and Student Support Services allow under-represented students to fluidly move from junior high to high school and then into college. Coupled with the opportunities of open access and admissions through community colleges and the grant aid of GEAR-UP and Pell Grants (Brock, 2010; Burke, 2014), many URM students began to thrive in their quest for a college education. Some of these programs and funding mechanisms are designed for students to directly apply to the federal government (e.g., Pell Grants), and some require institutions of higher education to apply for the grants to support these students. This book provides the fundamentals of the structure and purpose of these programs while also serving as a comprehensive resource guide to support parents, students, faculty, and administrators.

As institutions of higher learning are looking to align their schools with the vast numbers of diverse students entering the academy, academic pipeline programs can serve to support and enhance diversity, equity, and inclusion efforts. The US Census (2014) estimates ethnic minority populations, particularly African American and Hispanic American combined, will reach parity with the white majority population by 2044 (Colby & Ortman, 2015). Table 1.1 indicates that the numbers of URM students entering college, in general, are projected to nearly match the number of majority of students by 2022 and this trend continues into 2030 (National Center for Education Statistics, 2019). Schools that exceed 50 percent of the population with one of the historically underrepresented minority groups (Hispanic American, African American, or Native American) can qualify to have the distinction of an MSI and qualify for Title III funding under the Higher Education Act (US Department of Education, 2014). Many institutions in California and Texas have taken advantage of this support to financially and programmatically sustain their increasing Hispanic populations. All the above initiatives serve as a conduit to support underserved populations in their journey.

Many institutions around the country are equipping themselves

Table 1.1. Actual and projected numbers and percentages of college-bound, public high school graduates by race/ethnicity.

Ethnicity	2009–10 (Actual #)	2009–10 (Actual %)	2022–23 (# Projected)	2022–23 (% Projected)	2029–30 (# Projected)	2029–30 (% Projected)
White	1,871,980	60	1,619,670	49	1,475,140	45
Black	472,261	15	437,020	13	425,170	13
Hispanic	545,518	17	897,540	27	908,160	28
Asian/P. Islander	167,840	5	217,500	7	237,300	7
Native American A. Native	34,131	1	28,350	1	24,420	1
Two or more races	36,292	1	138,660	4	195,160	6
Totals	3,128,022	100	3,337,740	100	3,265,340	100

Source: National Center for Education Statistics, 2019.

with programs to support these projections. Example programs include extensions of the TRIO programs (developed in the 1970s, 1980s, and 1990s), such as Educational Opportunities Centers, the Ronald E. McNair Post-Baccalaureate Achievement Program, Upward Bound Math-Science, and Veterans Upward Bound. Further, there are a host of government-supported programs, such as the National Institutes of Health (NIH) and National Science Foundation (NSF) programs, which have been developed over the past two to three decades. More recently, there has been more attention given to the creation of programs to support individuals nearing the end of the pipeline (i.e., graduate students, postdocs, and faculty), assuring a comprehensive system of initiatives to support collegiate success among LIFG and URM individuals (see figure 1.3). Our current book brings awareness to these programs.

The history of academic pipeline programs highlighted in this book were gathered by asking specific questions detailing the creation of each initiative. We asked programs to reflect on the following: establishment year, the rationale for the creation of the program, significant milestones, namesake, number of students served, notable alumni, and level of the academic pipeline. We
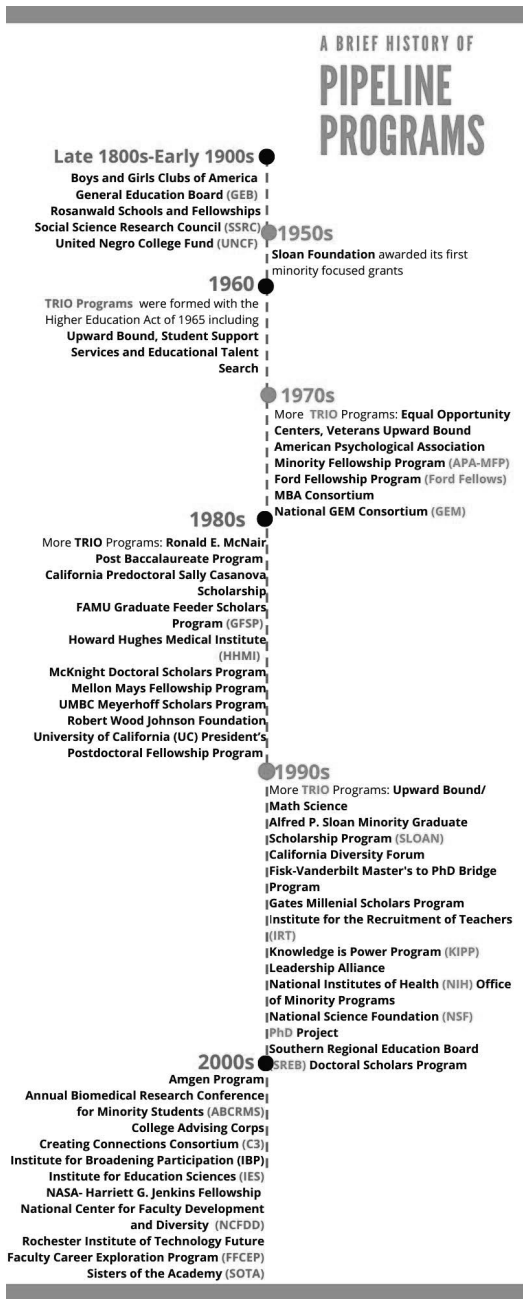
A BRIEF HISTORY OF PIPELINE PROGRAMS

Late 1800s-Early 1900s
Boys and Girls Clubs of America
General Education Board (GEB)
Rosanwald Schools and Fellowships
Social Science Research Council (SSRC)
United Negro College Fund (UNCF)

1950s
Sloan Foundation awarded its first minority focused grants

1960
TRIO Programs were formed with the Higher Education Act of 1965 including **Upward Bound, Student Support Services and Educational Talent Search**

1970s
More TRIO Programs: **Equal Opportunity Centers, Veterans Upward Bound American Psychological Association Minority Fellowship Program** (APA-MFP) **Ford Fellowship Program** (Ford Fellows) **MBA Consortium National GEM Consortium** (GEM)

1980s
More **TRIO** Programs: **Ronald E. McNair Post Baccalaureate Program California Predoctoral Sally Casanova Scholarship FAMU Graduate Feeder Scholars Program** (GFSP) **Howard Hughes Medical Institute** (HHMI) **McKnight Doctoral Scholars Program Mellon Mays Fellowship Program UMBC Meyerhoff Scholars Program Robert Wood Johnson Foundation University of California (UC) President's Postdoctoral Fellowship Program**

1990s
More TRIO Programs: **Upward Bound/ Math Science Alfred P. Sloan Minority Graduate Scholarship Program** (SLOAN) **California Diversity Forum Fisk-Vanderbilt Master's to PhD Bridge Program Gates Millenial Scholars Program Institute for the Recruitment of Teachers** (IRT) **Knowledge is Power Program** (KIPP) **Leadership Alliance National Institutes of Health** (NIH) **Office of Minority Programs National Science Foundation** (NSF) **PhD Project Southern Regional Education Board** (SREB) **Doctoral Scholars Program**

2000s
Amgen Program Annual Biomedical Research Conference for Minority Students (ABCRMS) **College Advising Corps Creating Connections Consortium** (C3) **Institute for Broadening Participation (IBP) Institute for Education Sciences** (IES) **NASA- Harriett G. Jenkins Fellowship National Center for Faculty Development and Diversity** (NCFDD) **Rochester Institute of Technology Future Faculty Career Exploration Program** (FFCEP) **Sisters of the Academy** (SOTA)

Figure 1.3. A brief history of academic pipeline programs.

were intentional about gathering historical context at the level of detail that is included in each chapter. However, programs vary greatly on the historical records that are kept accessible for consumers. Adding *H* to as a part of the THRIVE Index tool promotes the transfer of culture and heritages of programs. The following section describes how research is an essential component of many pipeline programs, needed to prepare those navigating the academy.

RESEARCH PREPARATION

The *R* dimension of THRIVE represents research broadly including research preparation activities as well as roles, responsibilities, and routines that are related to entry into the academy. Much like the research environments that some liberal arts colleges create, pipeline programs promote research preparation by placing value on learning for learning's sake and allow students to discover their talents and callings. Research preparation comes in the form of precollegiate programs, which require participants to study the requirements of applying to college and find the appropriate fit based on their academic or career interests. Collegiate programs introduce beginning scholars to research methodologies and concepts, helping students develop academic skill sets that prepare them for advanced study, hash out advanced degree options, and better solidify career trajectories. Postbaccalaureate programs provide research and course preparation for medical schools, advanced professional degree programs and other graduate study, especially if applicant qualifications do not meet entrance criteria. Graduate and professional programs provide more purposeful research acumen by providing nuanced training on communicating one's expertise to multiple audiences and assisting students in gaining knowledge on discipline-specific cultural research dynamics (Tull, 2019). Within postdoctoral and faculty programs, various professional development opportunities include grantsmanship,

publishing scholarly work, navigating the academic market, and preparation for the tenure process (Abraham, 2013).

We contextualize research preparation as programming and preparation for moving through the academic pipeline, as well as activities supporting career success. Research preparation is critical to the advancement of scholarship and advancing students and faculty in the academy, and we demonstrate how programs develop participants' skills, such as various methodologies, advanced writing, preparation for advanced coursework, and the actual completion of the research process. Without the critical component of developing participants research acumen, it would be difficult for these students to advance in the academic pipeline. Within the *R* there are also various roles, routines, and responsibilities associated with navigating the pipeline revealed in the events, social exchanges, and traditions.

INCLUSION AND IDENTITY DEVELOPMENT

Inclusion

The *I* dimension of THRIVE represents inclusion and identity. *I* illustrates how academic pipeline programs operate so that participants are included in a community of those they aspire to work with and a place to discover the intersection of their own identities. These programs often provide the support and safe spaces to allow URM students the opportunity to figure themselves out enough to not be "shook" by the inequalities they face in high school, on college campuses, or among colleagues in the academy. We are emphasizing programming that strengthens inclusionary practices for URMs. Initiatives that include a belongingness component have impacted career satisfaction (Brady et al., 2020).

In addition to providing an environment that welcomes URMs, academic pipeline programs incorporate instructional practices

that bring their future academic and career selves to life. We adapted one of the University of Michigan's Center for Research on Learning and Teaching (CRLT) diversity and equity teaching resources for inclusive teaching to characterize *I*. The adaptation of their teaching principles provides a foundation to define inclusionary learning practices associated with academic pipeline programs:

1. Deliberately cultivate a learning/training/working environment where all are treated equitably, have equal access to learning, and feel welcome, valued, and supported in their learning/job (sense of belongingness).
2. Attend to social identities (described below under "Identity").
3. Seek to change the ways systemic inequities shape dynamics in teaching-learning spaces, affect individuals' experiences of those spaces, and influence program design.

Inclusion goes beyond focusing on diversity by instituting a culture of equity and social justice, respecting all backgrounds, and allowing intellectual creativity to focus on issues that are near to the lived experiences of URMs (Puritty et al., 2017).

Identity

Identity is multifaceted and relates to how people view themselves and others. Gee (2001) describes identity across four levels. Identity includes states (linked to nature), positions (linked to status within institutions), traits (linked to who others recognize us as), and experiences (linked to affinities shared among groups). Social-identity categories include several visible and invisible personal characteristics (Worthington, 2012), including age, dis(ability), first-generation status, gender, language use (e.g., bilingualism, bidialectalism), military/veteran status, foreign-birth status (e.g., undocumented immigrants, noncitizens of the United States),

political ideology, race/ethnicity, religion, sexual orientation, and socioeconomic status.

Training in academic pipeline programs often emphasizes how the intersections of our social identities improve self-efficacy or the way that personal competence is viewed (Bandura & Schunk, 1981). For greater self-efficacy related to academic or career identity, it helps to see one's success despite the very demanding arena of academic institutions. Professional development activities present in academic pipeline programs promote retention in scientific careers due to the gains in self-efficacy and identity (Chemers et al., 2011). The approaches taken by academic pipeline programs to change participants' views of themselves are supported by social psychological research, which shows that certain training activities increase student achievement and career success (Krim et al., 2019; Williams, Ari, & Dortch, 2010; Williams, Ari, & Dortch, 2011; Yeager et al., 2019; Yeager & Walton, 2011), student retention (Murphy et al., 2020), and faculty hiring (Liu, Brown, & Sabat, 2019). The combined focus on inclusionary practices and creating a culture that embraces various identities and perspectives ultimately impacts the long-term engagement of URMs in the academy.

PROVIDING VOICE

V in the THRIVE Index represents voice. Academic pipeline programs open the door for URMs to "take a seat at the table" by allowing participants to bring their experiences and perspectives to the conversation. They allow individuals to enhance the expression of their academic *voice* and to define their own sense of purpose or belonging in the academy. McLeod (2011) suggests that voice is twofold. It includes expression from marginalized groups and listening from stakeholders in higher education. Voice can be used to promote equity and reform. When programming considers voice, participants are empowered to fulfill their career goals and make changes for other generations that follow. One of the most

successful interventions related to voice is demonstrated through mentorship.

Mentorship

Many of these initiatives provide mentorship and networks to give voice to participants not well represented in their institutions. Mentors can come in many forms, from teachers and faculty to administrators and senior students. What is essential to these relationships is for the participant to grow and feel empowered as an individual, researcher, colleague, and scholar. Pipeline programs link those who lack academic role models with successful professionals in a very deliberate fashion. Many programs use mentorship to create and cultivate inclusive learning environments, foster research collaborations, and increase positive interactions among students, faculty, and administration (Nora & Crisp, 2007). Mentoring can be defined in a variety of ways, depending on the relationship between the protégé/mentee and the mentor.[3] According to Scandura and Williams (2004):

> A protégé is the person who is guided and supported by a mentor or coach. A *mentor* is an influential individual with a higher ranking in your work environment who has advanced experience and knowledge so he/she can give you support, guidance, and advice for your development. Your mentor can be from inside or outside your organization but is not your immediate supervisor. He/she is recognized as an expert in his/her field. Most of the mentor relations are long term and focus on general objectives of development. (p. 455)

The above definition portrays the numerous relationships that are common among most of the pipeline programs described

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3. The terms *mentor* and *protégé* will be used interchangeably throughout this book.

throughout the book. This definition also portrays a mentee as an apprentice who receives knowledge in a hands-on way from someone who had knowledge about their level of the pipeline or who has already progressed further in the pipeline. Pipeline programs pair URM mentees with more seasoned peer, faculty, and/or administrator mentors in the context of a research or skill-related experience. The addition of mentoring increases the success of pipeline programs (Linn, Palmer, Berenger, Gerard, & Stone, 2015) and the ability of their participants to persist and navigate through the academy (Lunsford, Crisp, Dolan, & Wutherick, 2017; Toldson, 2019). Across pipeline programs, mentoring is either tailored to the individual protégé (e.g. near peer, peer, and senior mentors; Montgomery, Dodson, & Johnson, 2014) or a network of mentees and mentors (e.g. tiered mentoring; Rockquemore, 2013). The mentoring relationship seen in pipeline programs provides key attributes deemed as successful (Haggard, Doughtery, Turban, & Wilbanks, 2011): (1) a reciprocal exchange benefiting both the mentee and mentor, (2) developmental or aspirational benefits for the protégé, and (3) regular/consistent interactions over a period of time.

Academic pipeline programs are used to promote the exchange of social and cultural capital from the mentor to the mentee. Social capital refers to the sum of the actual or potential resources tied to a network of institutionalized relationships or memberships to a group (Bourdieu, 1977). URMs often lack in social capital or the networks of powerful people who provide inside information, invaluable coaching, and guidance in securing desirable positions, promotions, and connections to succeed in the academy (Bajaj, 2014; Byrd, 2016). Social capital usually allows for the attainment of other forms of capital like cultural capital. Cultural capital can be conceived of as institutionalized attitudes, behaviors, preferences, and goods that reflect the dominant culture (Lamont & Lareau, 1988). Cultural capital is unequally distributed and can be subject to scarcity (Lareau & Weininger, 2003). At all levels of the pipeline, protégés are individuals aspiring to obtain cultural capital (i.e.,

the disposition, skill set, attitudes, and behaviors fostering academic competence) from mentors who have reached a status in life beyond their current status (Farmer-Hinton & Adams, 2006; Yosso, 2005). Table 1.2 provides an overview of how certain social capital components (Coleman, 1988, 1990; Nishi, 2017) are fostered through the culture and structure of mentoring relationships within pipeline programs. The transmission of social and cultural capital is a necessary means for LIFG and URMs to successfully enter and become a part of the academy, connect to influential networks, and overcome the barriers their majority counterparts do not face (Byrd, 2016). The mentorship relationships developed in many pre-collegiate, collegiate, and graduate academic pipeline programs are used to advance students' academic careers and transferable skills used in acquiring future mentors.

Furthermore, the cultural and social capital and networks developed in a participant's academic journey helps them to overcome obstacles and provides the voice needed to become a self-motivated, confident, and successful career scholar. Voice brings a sense of belongingness in the academy that is fostered by allowing participants to convey their experiences and perspectives to the conversation This leads to collaborative discussions with everyone, and allows for constructive debates of issues while promoting diversity and inclusion (McLeod, 2011). Privileging voice may come from socialization in professional settings like interactions in workshops or conferences and/or from completing a project or published work within one's discipline of study. Participants in academic pipeline programs are given the chance to liberate their voice through a community of brave and safe spaces. Brave spaces (Arao & Clemons, 2013) allow for controversy with civility, respect, ownership of intentions and impact, and "no attack" zones. Safe spaces spark movements and activism. Activism has been demonstrated when alumni of pipeline programs challenge program policies and decision-making processes. The concept of voice allows for program development and growth among its participants.

Table 1.2. Components of social capital established within pipeline program mentoring structure.

Social Capital Components	Pipeline Program Mentoring Structure
Norms: standards of behaviors set for the relationship between protégé/mentees and mentors.	Protégé/mentee: mentor relationship structure varies by each pipeline program (e.g., regularly scheduled meetings and workshops, visible representation of diversity within the pipeline, social displays of scientific knowledge and practices).
Mores and Values: specific expectations to guide behavior in the context of the protégé in academic settings.	Protégés are shown academic customs, pitfalls, departmental politics, and taboos to avoid in order to succeed.
Networks: systems of social linkages to other members within the academy maintained through ties of the mentor's social network.	Protégés are allowed to attend functions with mentors (e.g., dinners, social events, retreats).
	Mentor and program directors provide access to academic resources and information needed for success (e.g., undergraduate, graduate, or postdoctoral training; standardized test preparation; writing and research workshops; tenure and promotion information).
Trust: community conducts their relations in good faith and no individual acts solely out of self-interest.	The protégé is recognized and valued by the mentor (e.g., coauthorship, graduate school/job references).
	Mentors are transparent about unspoken norms.

EXPECTATIONS OF THE PROGRAM

The final dimension in the THRIVE Index, *E*, characterizes academic pipeline programs by representing expectations for what participants or institutions will gain from these initiatives. This final component illustrates the evaluative components of programs, providing outcomes and results of programming. The purpose of this section is to see if programs are achieving their own goals and to see the comprehensive goal of diversity and inclusion

in the academy. As with any assessment tool, it is essential to close the loop and learn about the outcomes of these academic pipeline programs.

Specific examples of the expectations of academic pipeline programs include external review, site visits, annual performance reports, and program surveys. They can include various key performance indicators (KPIs) that provide quantifiable measures of the successes of these initiatives. For participants, academic pipeline programs set the expectation of entering the academy through the pursuit of advanced study and higher learning. Expectations could drill down to simply completing a project, conducting research, developing intellectual property, publishing a scholarly work, earning a degree and moving to the next level of the pipeline, or finding employment. Essentially, the *E* of THRIVE provides a measure of what has worked over time and for whom and potential next steps for the evolution of programming.

As we dive into the programs and initiatives highlighted in the following chapters, we would like to provide readers with a few caveats. In these times, when structural and systemic racism is being brought to the forefront within society and organizations, we are aware that some of these programs may have had issues with inclusive and fair practices. While we understand that many of our programs have twenty to thirty years of tenure and have faced difficulties and challenges, our goal is to focus on the instrumental positive changes they have collectively brought to diversifying the academy.

BOOK ORGANIZATION

This publication highlights twenty-one well-established pipeline programs that support URM participants and prepare them from the beginning of college through to junior faculty positions and beyond. All highlighted programs have had a wealth of successful outcomes (e.g., graduation rates, retention rates, effective

movement into next academic level). Moreover, the majority of the initiatives and programs in the book were established at least fifteen years ago. The following chapters will discuss each type of pipeline program along the academic journey (see figure 1.4). We provide an in-depth analysis of the programs in the following chapters using the THRIVE Index tool. Chapter 2 includes precollegiate programs: Knowledge Is Power Program (KIPP), College Advising Corps, United Negro College Fund Portfolio Project and Fund II Foundation STEM Scholars Program, and University of Maryland, Baltimore County (UMBC), high school to college, Meyerhoff Scholars Program. Chapter 3 highlights collegiate programs: Leadership Alliance, Mellon Mays Undergraduate Fellowship Program, Florida A&M University (FAMU) Graduate Feeder Scholars Program (GFSP), Institute for the Recruitment of Teachers, California Pre-Doctoral Program's Sally Casanova Scholarship, and Annual Biomedical Research Conference for Minority Students (ABRCMS).

Chapter 4 includes graduate programs: Southern Regional Educational Board (SREB)-State Doctoral Scholars Program, McKnight Doctoral Fellowship Program, Alfred P. Sloan Foundation Minority Graduate Scholarship Program, Ford Foundation Fellowship Program, National GEM Consortium, and Fisk-Vanderbilt Master's-to-PhD Bridge Program. Chapter 5 includes postdoctoral /faculty development programs: University of California (UC) President's Postdoctoral Fellowship Program, National Center for Faculty Development & Diversity (NCFDD) Faculty Success Program, Sisters of the Academy (SOTA) Institute, Rochester Institute of Technology (RIT) Future Faculty Career Exploration Program, and Creating Connections Consortium (C3). Chapters 2–5 also include several governmental- and foundation-funded pipeline programs to complete our snapshot of diversity initiatives advancing URM populations.

We end the book (chapter 6) with information that is helpful for using and developing academic pipeline programs. We provide suggestions on how to leverage programs at each level of the pipeline while highlighting themes that have made them successful based on the THRIVE Index. In addition, a model is introduced to aid institutions with coordinating pipeline programs across levels. Finally, using the THRIVE index, we document the majority of all the pipeline initiatives in the United States with an interactive appendix that is linked to a geographic information system (GIS). Because this book is offered as a paper and online open-access publication, the GIS aligns with the web format of Lever Press. Figure 1.4 provides an overview of the chapter structure of the book.

Chapter 1	Chapter 2	Chapter 3	Chapter 4	Chapter 5	Chapter 6	Interactive Appendix
Understanding Academic Pipeline Programs and Their Origins	Precollegiate	Collegiate	Doctoral/Graduate/Professional Programs	PostDoctoral/Faculty	Closing Thoughts	
	Knowledge is Power Program (KIPP)	The Leadership Alliance	SREB State Doctoral Scholars Program	University of California (UC) President's Postdoctoral Fellowship Program		
	College Advising Corps	Mellon Mays Undergraduate Fellowship Program	Alfred P. Sloan Minority Graduate Scholarship Program	National Center for Faculty Development and Diversity (NCFDD)		
	United Negro College Fund (UNCF) -Portfolio Project -Fund II STEM Scholars Program	Florida A&M Graduate Feeder Scholars Program	Ford Foundation Fellowship Programs	Sisters of the Academy (SOTA)		
		Institute for the Recruitment of Teachers (IRT)	The National GEM Consortium	Rochester Institute of Technology (RIT) Future Faculty Career Exploration Program		
	University of Maryland Baltimore County (UMBC) Meyerhoff Scholars Program	California Predoctoral Sally Casanova Scholars	Fisk-Vanderbilt Master's to PhD Bridge Program	Creating Connections Consortium (C3)		
		Annual Biomedical Research Conference for Minority Students (ABRCMS)				

Figure 1.4 Chapter overview.