

Work in Progress on a Model to Improve the Preparation and Transition of Hispanic STEM Doctoral Students into Community College Faculty Positions - Lessons Learned

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Dr. Miguel Velez-Reyes is the George W. Edwards Distinguished Professor in Engineering and Chair of the ECE Department at University of Texas at El Paso. He received his BSEE degree from the University of Puerto Rico at Mayaguez (UPRM) in 1985, and his SMEE, and PhD from MIT in 1988 and 1992 respectively. He was a faculty member of the UPRM ECE Department from 1992 to 2012. He is the UTEP Campus Coordinator for the NOAA Center for Earth Systems Science and Remote Sensing Technology. He was the Founding Director of the UPRM Institute for Research in Integrative Systems and Engineering, and Associate Director of the NSF CenSSIS ERC. His research interests are in integrating physical models with data driven approaches for information extraction using remote or minimally intrusive sensing. He has over 160 publications. He is Fellow of SPIE and the Academy of Arts and Sciences of Puerto Rico. Received the Presidential Early Career Award for Scientists and Engineers award from the US President in 1997. He chairs the SPIE Conference on Algorithms, Technologies and Applications for Multispectral, and Hyperspectral Imaging. He is interested in improving educational opportunities for students from under-served and socioeconomically disadvantage communities.

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Dr. Ivonne Santiago is a Clinical Professor of the Civil Engineering (CE) Department at the University of Texas at El Paso (UTEP). Dr. Santiago has a combined experience of over 20 years in the areas of water quality, water treatment and wastewater treatment in Puerto Rico (PR), New Mexico and Texas. Dr. Santiago is passionate about providing experiential learning opportunities to both undergraduate and graduate students locally, regionally and internationally with a focus on Hispanic and female students. She is currently Co-PI of UTEP's NSF-AGEP program focusing on fostering Hispanic doctoral students for academic careers; the Department of Education's (DoE) STEMGROW Program and DoE's Program YES SHE CAN. With support from the Center for Faculty Leadership and Development, she leads a Learning Community for Diversity and Inclusion for Innovation at UTEP. She is also a member of two advisory committees to UTEP's President: The Diversity, Equity, and Inclusion committee and is chair of the Women's Advisory Council. She is a member at large of the UTEP Council of Academy of Distinguished Teachers. She is secretary-treasurer for the Public Service Board, which manages El Paso Water. She was a member of the Environmental Protection Agency National Advisory Committee (NAC), that advises the Administrator of the EPA on environmental policy issues related to the implementation of the North American Agreement on Environmental Cooperation. Also, she was a member of the Good Neighbor Environmental Board (GNEB) that advises the President and Congress of the United States on good neighbor practices along the U.S./Mexico border. She has received local and state teaching awards: 2014 UTEP's CETaL Giraffe Award (for sticking her neck out); 2014 College of Engineering Instruction Award; 2014 The University of Texas System Regents' Outstanding Teaching Award; and the 2012 NCEES Award for students' design of a Fire Station. She also received 2018 American Society of Civil Engineers' Texas Section "Service to the People" award, and 2019 El Paso Engineer of the Year by the Texas Society of Professional Engineers. This is the first time in more than 30 years that a UTEP faculty wins this prestigious award.

Victor Manuel Garcia Jr., The University of Texas at El Paso

Victor Garcia is a doctoral candidate at The University of Texas at El Paso, and a research associate of the Yes She Can and NSF H-AGEP programs. Victor's doctoral dissertation focuses on investigating the development of performance-engineered mix designs to produce balanced mix designs. His research interests are in the areas of characterization and design of pavement materials, civil engineering applications in Smart Cities, and STEM-oriented education research.

Irma Y. Torres-Catanach, The University of Texas at El Paso

Irma Torres-Catanach, PhD, is a postdoctoral researcher at the University of Texas at El Paso, and has worked as part of the research team for the H-AGEP program for the past three years. Her educational background is in psychology, and prior to returning to school to obtain a doctorate degree, she worked as a mental health clinician for fifteen years. Within STEM-education, her research interests are centered on broadening participation of underrepresented minority students in STEM across all educational levels, mentoring experiences, community cultural wealth, and examining URM student's STEM career decision-making process and STEM identity development.

Dr. Dawn M. Horton, University of Massachusetts, Amherst

Dawn Horton earned her first doctorate from Teachers College, Columbia University in Education. Her dissertation, *The Genetic Epistemology of the Human Genome Field*, expanded her mentor Dr. Howie Gruber's cognitive case study methodology to consider how an entire field develops new knowledge. Her second doctorate, from Montclair State University, focused on the differential effectiveness of school counselors in the graduation of their assigned students. Dr. Horton's research focuses on creativity and the development of new knowledge, systems to improve student outcomes in high school, and the college/career trajectory of students. She is currently employed as an Assistant Professor at the University of Massachusetts, Amherst.

Dr. Yajaira Mejia, The City College of New York

Dr. Mejia is the Director of The Hispanic Alliance for the Graduate Education and the Professoriate on Environmental Sciences and Engineering (H-AGEP). Dr. Mejia earned a Doctorate degree in Civil Engineering from the City University of New York (2008) Graduate Center, a Master in Civil Engineering with a focus on water resources at the City College of New York (2004), and a Bachelor's degree in Civil Engineering at the University of Medellin in Colombia (2001). Dr. Mejia worked as a postdoctoral researcher at the National Oceanic and Atmospheric Administration – Cooperative Remote Sensing Science and Technology (NOAA-CREST) Center in collaboration with NOAA Scientists at the Cooperative Institute for Climate and Satellites (CICS), 2008-2010. Dr. Mejia's graduate and postdoctoral research focused on snowfall detection and estimation using satellite information. She presented her research work at many national and international conferences and also published it in several journals. Her passion for research and education lead her to take a position as the assistant director of the Earth Sciences and Environmental Sustainability (ESES) Graduate Initiative and the Alliance for Continuous Learning Environment for STEM (CILES) at the City College of New York (CCNY) where she also served as an outreach team member at the NOAA-CREST Center, 2010-2015. Since 2012, Dr. Mejia has also served as evaluator for the Greater Caribbean Regional Engineering Accreditation System (GCREAS). She has visited and evaluated over five engineering programs at different academic institutions in the Caribbean. Dr. Mejia has wide experience managing graduate and undergraduate programs in engineering and sciences fields. Over ten years, Dr. Mejia gained extensive experience in working in the academic environment at a higher education institution working with students, faculty, and administrators at different levels. She is also an educational consultant to provide support to national and international higher education institutions to improve student learning, enhance curricula, provide teaching and academic support, expand student professional opportunities, provide professional development to faculty, and increase the source of resources available to the institutions.

Dr. Dugwon Seo, Queensborough Community College

Dr. Dugwon Seo is an assistant professor in Engineering Technology Department at Queensborough Community College. Dr. Seo has been teaching engineering technology courses including digital circuit, computer applications, computer-aided analysis, and renewable energy. Her research interest includes various renewable energy, digital circuit system, remote sensing, and technology education.

Prof. Jorge E. Gonzalez, City University of New York, City College

Prof. González is the Director of The Hispanic Alliance for the Graduate Education and the Professoriate on Environmental Sciences and Engineering (H-AGEP), of The CUNY Initiative to Promote Academic Success in STEM (CiPASS), lead scientist of the Coastal-Urban Environmental Research Group

(CUERG), The City College of New York Presidential Professor, and the NOAA CREST Professor of Mechanical Engineering at the City College of New York. Prof. González earned his Doctorate (1994) and Bachelor (1988) degrees in Mechanical Engineering from the Georgia Institute of Technology and from the University of Puerto Rico-Mayagüez, respectively. He joined The City College of New York faculty in 2008 after tenures at Santa Clara University, California, as Professor and David Packard Scholar, and as Chairman and Professor of Mechanical Engineering at the University of Puerto Rico-Mayagüez. He teaches and conducts research in urban energy sustainability, urban weather and climate, urban remote sensing, and regional climate modeling and analysis. Professor González holds several patents in solar energy equipment, aerosol detection, and energy forecasting for buildings, and was recognized as a prominent young researcher by the National Science Foundation with a prestigious CAREER Award. He has authored or co-authored more than 10 peer-reviewed publications, has delivered 100s of conference presentations, and his research has attracted more than \$30M in external funding. He is a Fellow Member of the American Society of Mechanical Engineering (ASME), and Vice-Chairman of the American Meteorological Society Board on the Urban Environment. He was appointed in 2015 by the Mayor of the City as Member of the Climate Change Panel for the City of New York, and more recently as Senior Visiting Scientist of the Beijing Institute of Urban Meteorology and of Brookhaven National Laboratory. He was named in 2019 the Founding Editor of the newest ASME Journal of Engineering for Sustainable Buildings and Cities.

Prof. Joseph Barba, City University of New York, City College

Dr. Joseph Barba is Professor of Electrical Engineering at the Grove School of Engineering at the City College of New York. He received his BEE and MEE from the City College of New York and his PhD from the City University of New York. His research interests focus on the development of image and signal processing algorithms for biomedical applications. These include image segmentation, contour extraction, and quantitative measure of image shape, color and texture for use in classification of cell images in pathology. He served as Associate Dean of Undergraduate Studies for the School of Engineering from 1997-2000 and Deputy Provost at CCNY from 2000-2004. He was the founding dean of the Grove School at CCNY and served in this capacity till 2013. He currently serves as Director of the CCNY STEM Institute and serves as PI or Co-PI on several grants focusing on retention and workforce development of underrepresented students in STEM. He has served as the faculty advisor to the Latin American Engineering Student Association - Society of Hispanic Professional Engineers (LAESA-SHPE) since 1983.

Dr. Fenot Aklog, Teachers College Columbia University

Dr. Fenot Aklog is the Director of Research at the National Center for Restructuring Education Schools and Teaching and the Evaluation Manager at the Center for Technology and School Change, at Teachers College Columbia University. She serves as the external evaluator for H-AGEP as well as for other NSF and USDOE funded initiatives.

Prof. Fred Moshary, City University of New York, City College

Fred Moshary is a Professor of Electrical Engineering at the City College of New York (CCNY) and on the Doctoral Faculty of Earth and Environmental Science at the City University of New York Graduate Center. He received his PhD from Columbia University in Applied Physics in 1989 and was a postdoctoral research associate at the Harvard University Physics Department before joining CCNY in 1992. His initial research work was in the area of nonlinear optics and spectroscopy and subsequently evolved towards optical sensing where for the last 20 years, he has focused on sensors, sensor networks, and remote sensing techniques, technologies, and application. He is currently working on active and passive remote sensing of the atmosphere and coastal ocean waters with applications to atmospheric dynamics, air quality, ocean color (water quality), and climate change. He leads CCNY's Optical Remote Sensing Laboratory, and is the Science Lead Coordinator for the NOAA Cooperative Center for Earth System Science and Remote Sensing Technology, a NOAA funded university consortium led by CCNY which focuses on experiential training and workforce development at Undergraduate and graduate levels.

Dr. Jeff Sivils, El Paso Community College

Dr. Jeff Sivils is an assistant professor of biology at El Paso Community College (EPCC). Dr. Sivils is currently the EPCC National Science Foundation Principal Investigator for the Hispanic Alliance Graduate Education and the Professoriate (HAGEP) grant in Environmental Sciences and Engineering. The HAGEP grant promotes the expansion of Hispanic doctoral students to faculty at community colleges or teaching intensive universities. Dr. Sivils received his B.S. in microbiology from The University of Texas at El Paso (UTEP), worked in the biotechnology field before returning to UTEP to receive his Doctorate in Toxicology, where he studied the compensatory mechanism resulting from the loss of the multi-drug resistance transporters 1 (MRP1). He attained a Post Doctoral position at UTEP where he collaborated in the discovery and development of small molecules used for the treatment of prostate cancer.

Dr. Yasser Hassebo, The City University of New York, LaGuardia CC

Dr. Yasser Hassebo is a Professor of engineering at the Department of Mathematics, Engineering and Computer Science at the City University of New York, LaGuardia CC. He has about twenty years of research experience in optical remote sensing, Lidar systems, solar energy, and pedagogy. His current research activities involve the study of NYC boundary layer, and aerosol and cloud vertical structure using Micro Pulse Lidar in addition to the optimization of flexible solar panels. Dr. Hassebo is the primary founder and the senior co-coordinator of the Earth System Science and Environmental Engineering track (ESE) at LaGuardia. Currently, Dr. Hassebo is the teaching coach for the NSF-HAGEP PhD fellows at CUNY. He was among the 25 outstanding faculty design team, from 14 States, of the nationwide initiatives: Global Skills for College Completion (GSCC) and Taking College Teaching Seriously (TCTS). He developed and led several faculty professional development and curriculum development seminars and workshops in STEM pedagogy, locally and nationwide. He co-led Project Quantum Leap - Advanced Leadership and Curriculum (PQL-ALeC) a year-long seminar that promoting leadership and mentoring skills, curriculum development, and teaching math in compelling contexts at LaGCC.

Work in Progress: A Model to Improve Preparation and Transition of Hispanic STEM Doctoral Students into Community College Faculty Positions - Lessons Learned

Abstract

This work in progress (WIP) paper shares experiences and lessons learned from the first three years in the development and implementation of a model to improve the preparation and transition of Hispanic STEM doctoral students into community college (CC) faculty positions by the Hispanic Alliance for the Graduate Education and the Professoriate (H-AGEP). This is a collaborative effort between the City College of New York (CCNY) and The University of Texas at El Paso (UTEP) in partnership with El Paso CC (EPCC), LaGuardia CC (LaCC), and Queensborough CC (QCC).

The proposed model addresses the important need of recruiting more Hispanic faculty at CC who can serve as outstanding teachers, mentors and role models to students at CC. Over 50% of Hispanics start their college journey at a community college while less than 5% of faculty in higher education is from Hispanic backgrounds. Increasing the number of Hispanic who receive degrees from community college and who transfer to 4 year institutions to obtain degrees in STEM. Higher representation of faculty from Hispanic and other racial/ethnic groups on campus have a positive impact on underrepresented minority student's success when measured in grades and course completions as well as retention and degree completion.

The lessons learned came from a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis performed as part of a self-study conducted in December 2020. The study included H-AGEP fellows, CCNY and UTEP participant faculty, dissertation advisors, and CC faculty mentors. The lessons learned provide important feedback for program improvement as well as information to teams who may be interested in developing alliances and collaborations with similar goals. A key result of the assessment is the value that CC partners bring in supporting teaching training and in providing a positive perspective on careers at community college to the participating doctoral students.

The paper presents a brief summary of the H-AGEP model. Then it summarizes the findings from the self-study and concludes with the lessons learned from the process.

1 Introduction

Role modeling and mentorship are critical factors in the college careers and experiences of Hispanic and other underrepresented minority (URM) students. The National Center of Educational Statistics reported that only 5% of all full-time faculty in degree-granting postsecondary institutions were from Hispanic backgrounds [3]. The percentage is even lower in the STEM fields [4]. Previous studies have found that representation of faculty from Hispanic and other racial/ethnic groups have a positive impact on URM student success when measured in grades and course completions [1, 2]. Furthermore, they found that these interactions affect long-term outcomes such as subsequent course selection, retention, and degree completion. Fifty-two percent of Hispanic undergraduates attend community college (CC) because of its lower cost compared to four-year institutions [5]. However, only one in ten Hispanic students who start at a community college (with or without receiving an associate degree first) completed a degree at a

four-year institution. Therefore, the need for Hispanic faculty at community colleges is critical to improve STEM Hispanic student retention and success in undergraduate education.

The low percentage of Hispanics in STEM faculty positions is primarily driven by their low representation in graduate programs. Furthermore, doctoral programs primarily focus on research-centered careers in research-intensive academic institutions (R1 and R2), government laboratories or industry, so an academic career at a teaching intensive institution like a community college may not be among potential career options being considered by doctoral dissertating students or even discouraged by faculty and peers. However, community colleges account for a third of the higher-education sector and over 35% of advertised full time positions [6]. H-AGEP addresses this need by providing mentoring on careers at CC, training on evidence-based STEM teaching practices, providing opportunities to shadow CC faculty and teach at CC, and supporting the transition into community college faculty positions.

This paper reports on the lessons learned from the initial development and implementation of the H-AGEP model. Conducting a thorough review of the program was a priority for the alliance in its self-assessment process. To this end, a survey requesting input for the SWOT analysis was created and distributed to all members of the H-AGEP alliance including program fellows, core faculty members, dissertation advisors, teaching training mentors, and CC faculty mentors. Conclusions and recommendations drawn from this study are provided to implement best practices to continue developing, evaluating, and modifying H-AGEP model components.

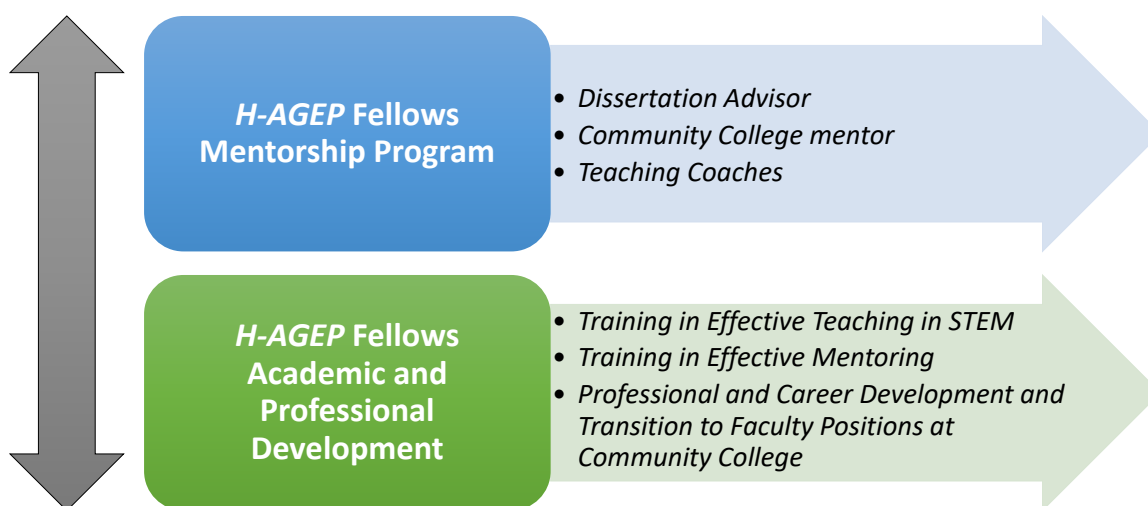


Figure 1: H-AGEP Model Structure.

2 H-AGEP Model

A detailed description of the H-AGEP model is provided in [9]. The program model is depicted in Figure 1. The model has two phases: 1) Mentorship program, and 2) Academic and professional training. The H-AGEP model consists of two phases.

- *Phase 1 Mentorship:* H-AGEP Fellows are supported by a team of mentors that serve as role models, provide advice and guidance in their training for the professoriate and support professional network building for the H-AGEP fellows. The mentoring team includes the dissertation advisor, teaching coaches at UTEP or CCNY, CC Mentors, peer-mentors

(former and previous cohort H-AGEP fellows) and faculty members from the H-AGEP faculty team.

- *Phase 2 Academic and Professional Development:* The academic and professional training includes three primary intervention components: (i) training and mentoring program for effective teaching at community colleges; (ii) training on undergraduate student academic, professional and research mentoring; and (iii) professional development to address career advancement in academia and transition to academic positions at community college.

The Academic and Professional Development Phase is depicted in Figure 2. The *Teaching Training Program* is the main intervention of the H-AGEP model that allows fellows to receive teaching training in evidence-based practices for teaching in STEM, as well as gain teaching experience by completing a teaching practicum at a one of the partner community college under supervision of a community college faculty member. This activity and the interaction with the community college faculty and students have proven (according to results from our external evaluation) to be critical in forming and changing the perception of fellows of careers at community college.

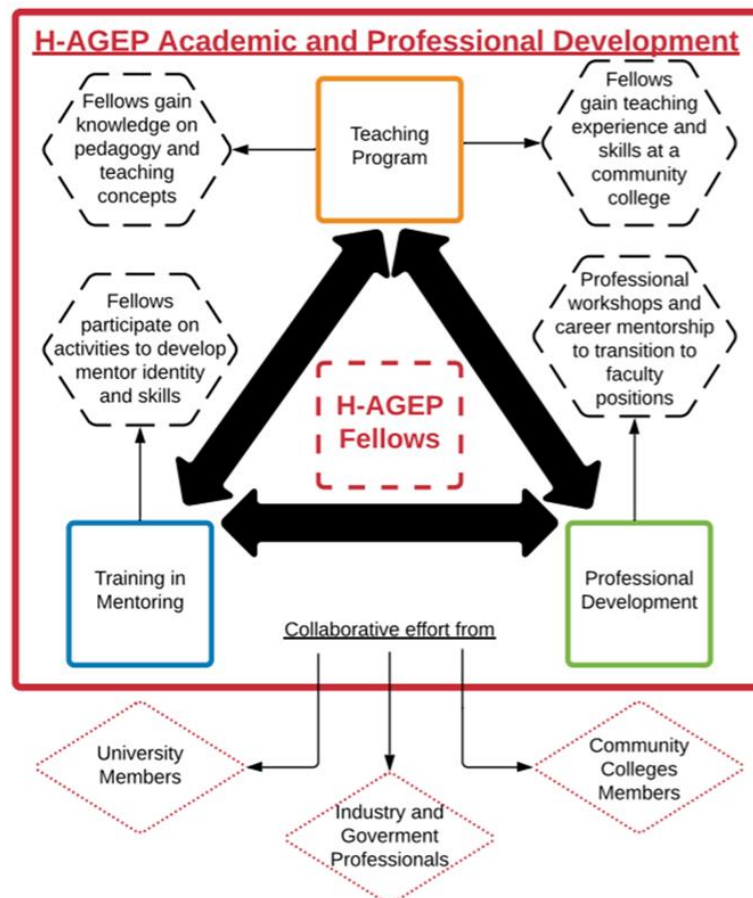


Figure 2: H-AGEP Academic and Professional Training Phase.

The *Professional and Career Development* component consists of workshops offered to fellows on a wide range of topics relevant to their professional development and preparation to transition to academic positions at community college. The *Mentorship Component* facilitates training for

fellows on best practices for mentoring undergraduate students (professional, academic, and research) and provide opportunities for mentoring of students at community college.

A timeline for the program is presented in Figure 3. The program duration is 2 years. Doctoral student participants, referred to as H-AGEP Fellows, are selected based on interest in the professoriate, and endorsement by the dissertation advisor. Students must be at the candidacy level: have completed all coursework, defended their dissertation proposal, and passed qualifying exams. The first cohort of six students (3-CCNY, 3-UTEP) joined the program in spring 2018. The second cohort in fall 2019 (3-CCNY, 4-UTEP). The third cohort in fall 2020 (2-CCNY, 4 –UTEP).

COVID presented a major challenge for the program. All activities moved online, including the teaching training program. The pandemic emphasized the need for skills in online teaching and the teaching training program is making needed revisions to include it.

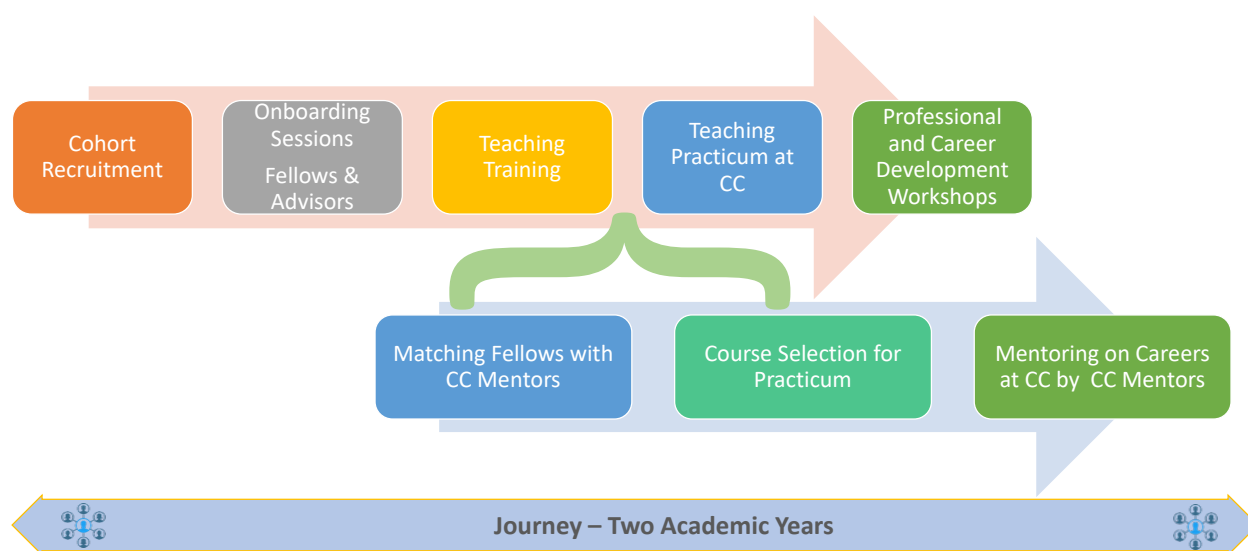


Figure 3: H-AGEP Cohort Timeline.

3 Research Component

The primary research goal of H-AGEP is centered on gaining a better understanding of the career-decision making process of Hispanic STEM doctoral students and identifying what factors influence their decision to pursue an academic career at community colleges and other two-year associate granting institutions. In this research endeavor, H-AGEP will contribute to increase knowledge about the barriers and supports which influence the career decision-making of Hispanic STEM doctoral students. What is less known, however, is how Hispanic STEM doctoral students make decisions to pursue an academic career at community college? Researchers will also examine the factors that support or inhibit the pursuit of academic careers for fellows across the intersectional identities of race/ethnicity, gender, first-generation status, personal experience as a community college student, and Pell Grant status as an undergraduate. Given the need for community colleges to hire faculty in STEM fields that are reflective of their racially and ethnically diverse student population, the research findings will serve to offer recommendations for future work that is geared towards effectively preparing Hispanic STEM doctoral students to consider academic careers at teaching-intensive institutions such as community colleges.

To achieve the above-referenced goals in this grant, three research tasks are being pursued. The primary, and most labor intensive, is conducting semi-structured interviews with all Fellows regarding their career decision-making processes. The interview questions that were developed using the Social Cognitive Career Theory (SCCT) framework [10, 11, 12] to obtain Fellow's historical and current career trajectory. Aspects of their career decision-making were queried by the following questions:

1. How did Fellows develop an initial interest in STEM?
2. How did Fellows end up pursuing a STEM doctoral degree?
3. What are their views regarding the pursuit of a career as community college STEM faculty?
4. Is that option a part of their career trajectory as a result of participating in the H-AGEP teaching training interventions?

Demographic characteristics of the Fellows (N=13) from Cohorts 1 and 2 that were interviewed included seven Fellows from UTEP and six Fellows from CCNY. Six Fellows were male and seven were female. All seven Fellows from UTEP identified as being of Mexican descent, while at CCNY, two of the Fellows identified themselves as being of Puerto Rican descent and four Fellows reported being of South American descent. Fellows from cohort 3 will be given this same career decision-making interview in May 2021, and interviews with the last cohort of Fellows in this grant will be completed approximately May 2022.

In relation to the previous goal, the next research task centered on collecting data regarding the career decisions of Fellows who have graduated. We particularly want to know about the factors that influenced their eventual job choice and the process that lead them to that choice. The Job Search Survey, distributed to Fellows 3-6 months after graduation, is focused on collecting data related to the following: a) how Fellow's experience in their doctoral program influenced their career plans and decisions; b) how their experience as a Fellow in the H-AGEP program influence their career plans and decisions; c) what career options did they initially consider, did their career goals change over time and if so, what factors influenced changes to those career decisions; and d) were academic careers at community colleges a consideration in those decisions. Three Fellows have completed this survey so far, and we anticipate providing a richer analysis of the data once more Fellows graduate and complete this survey.

Finally, the third research task involves developing and distributing a national online survey to Hispanic Ph.D. STEM faculty currently working at community colleges to gain additional information related to their career decision-making and their current experiences working at a two-year institution. By collecting data from practicing faculty, information on the experiences of Hispanic STEM faculty will provide richer insights into the realities of this profession today. This survey also seeks to examine similarities and differences in the career trajectory of current Hispanic STEM PhD community college faculty with various intersectional identities and to make comparisons of these career trajectories to those of non-Hispanic STEM faculty teaching at community colleges. The research team is in the process of finalizing the survey and identifying potential recruitment sources to distribute this survey online by June 2021.

4 Lessons from Program Implementation

The program activities timeline for each cohort is presented in Figure 3.

4.1 Recruitment and Onboarding

Recruitment of fellows was initially based on common methods such as contacting STEM department chairs, doctoral program directors, and emailing all doctoral STEM students. However, recruitment was challenging even at two leading producers of Hispanic doctoral students. The limited number of candidates who met desirable qualification (Hispanic dissertating students) was limited. Conventional recruitment methods did not produce a large pool of candidates. Direct reach out to students and faculty proved to be the most successful approach. Many faculty advisors at both CCNY and UTEP, became program advocates once they became aware of its benefits. Furthermore at UTEP, H-AGEP fellows became advocates in reaching out to peers and encouraging them to apply.

Onboarding started in Cohort 1 primarily with the fellows. The need to engage dissertation advisors was clear as well as having a way to clearly communicate program expectations to the fellows. Following cohorts onboarding included more participation from the advisors and a memorandum of agreement describing all program activities and expected time commitment was created and is signed by both the fellow and the advisor.

To ensure all parties involved were informed of their responsibilities and time commitments, an all hands meeting is conducted with all members of the H-AGEP alliance after officially announcing the H-AGEP fellows selected for each cohort. All hands meetings are conducted every semester to ensure that all participants are up to date in program activities.

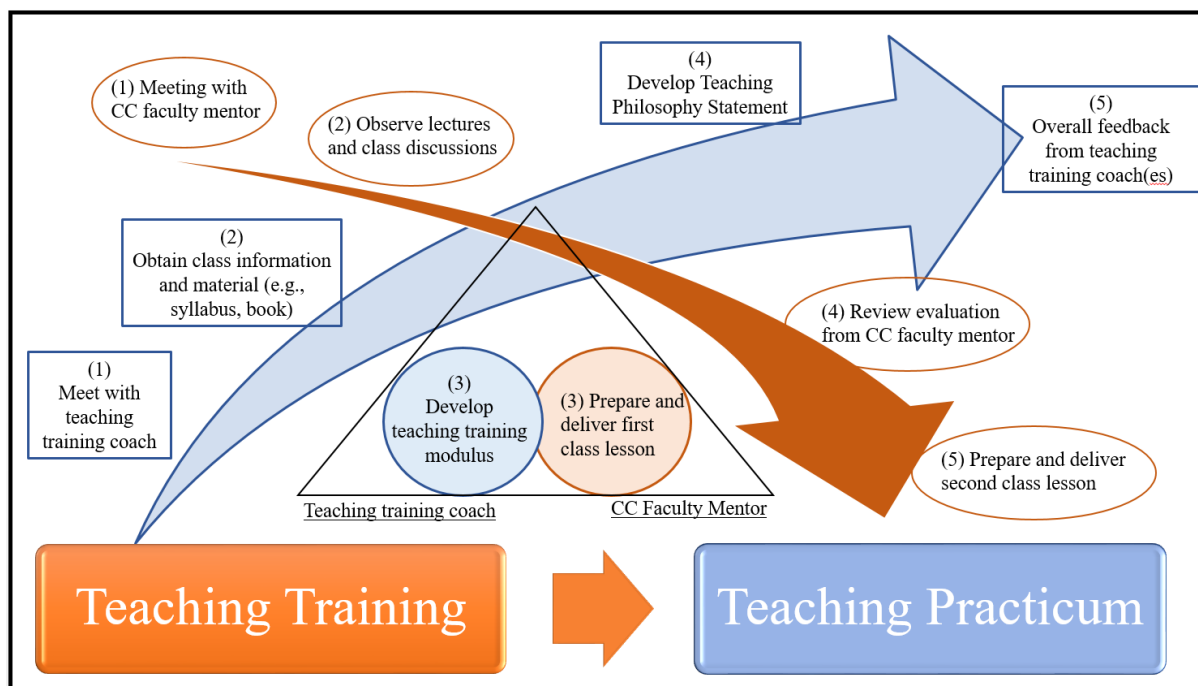


Figure 4: H-AGEP Teaching Training Program.

4.2 Teaching Training Program

The teaching program is a critical intervention component of the H-AGEP model. Given that many doctoral students are not equipped with complementary teaching experiences during their doctoral program, leveraging teaching opportunities for STEM doctoral students from

underrepresented populations, is of upmost importance for the development of competitive candidates for faculty positions at community colleges. The teaching program consists of two major components: a teaching training and a teaching practicum as shown in Figure 4.

The teaching training requires H-AGEP fellows to complete learning modules that introduce them to pedagogy concepts used in STEM undergraduate education teaching environments. A teaching training coach is assigned to the H-AGEP fellows at each lead institution, who coordinates the training with Fellows as they begin their teaching practicum at the corresponding community colleges (CC). The second component, the teaching practicum, provides fellows the opportunity to actively engage with students in a CC classroom and deliver a class lesson on a pre-defined topic. H-AGEP fellows work with an assigned CC faculty mentor during the teaching practicum to prepare the class lesson, material and obtain constructive feedback. The teaching training and teaching practicum are designed with activities that complement one another and ultimately help H-AGEP fellows to understand, develop and implement class material in a community college classroom using evidence-based STEM pedagogy concepts.

Leveraging of existing resources was critical in facilitating the implementation of the Teaching Training Program. Modules implemented in Blackboard were created using resource from the MOOC “An Introduction to Evidence-Based Undergraduate STEM Teaching” developed by the Center for the Integration of Research, Teaching and Learning (CIRTL) [7] under NSF Grant No. 1347605. This work is licensed under a Creative Commons Attribution-Noncommercial-ShareAlike 4.0 International License and it was used with permission. Students work in the modules at their own pace, followed by homework and biweekly meeting with the teaching coaches at CCNY and UTEP.

The initial implementation of the teaching training and teaching practicum was sequential. Teaching training the first semester and the practicum during the second. Cohort 1 fellows suggested to have both components concurrently. Using that approach, the practicum became the laboratory for just in time application of the concepts they were learning from the modules. That was preferred by students although it required higher time commitment during one semester. Being mindful of student’s time constraints and our concern of not affecting their progress towards degree completion, we were flexible in allowing fellows to use the sequential format when necessary.

COVID highlighted the need for online teaching training. Modules are being added to the teaching program addressing this.

4.3 Professional and Career Development

The professional development workshops aim to promote the Fellows’ professional development and knowledge in areas that are key to the professoriate and support their transition to community colleges. Given the distancing between CCNY and UTEP, this component has been held mostly online.

Workshops use resources from CC that talk about careers and applying to CC faculty positions. Fellows have welcome the multiple workshops and the interactions with resources from CC. A main request have been to have more hands-on activities to support preparation to apply for faculty positions such as reviews of application materials, and mock interviews.

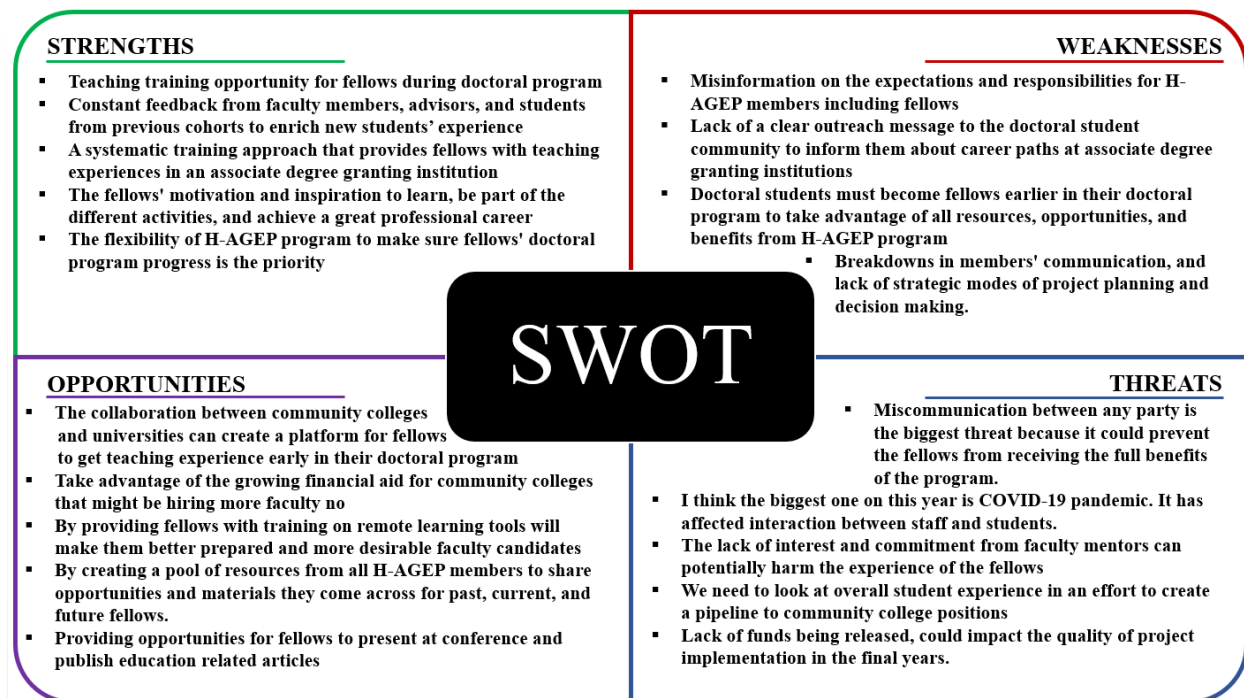


Figure 5: H-AGEP Model SWOT Analysis Summary

5 SWOT Analysis Summary

A Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis was conducted to assess the first 3 years of the program. The SWOT analysis performed via an online survey distributed to all H-AGEP members including the H-AGEP fellows from Cohort I and II. Although three cohorts of H-AGEP fellows have participated in the H-AGEP program during the last three years, only Cohort I and II fellows have completed the teaching training and teaching practicum. Figure 5 summarizes the feedback collected with the survey.

The SWOT analysis highlights the teaching training as the main strength of the program. Engagement with community college faculty has been key, as also highlighted in program evaluation [9], in creating a positive attitude of students towards careers at community college.

Communication with the different stakeholders is considered a program weakness. There is a need to improve how the fellows, dissertation advisors, and community college faculty mentors are informed about expectations and responsibilities during onboarding. Another weakness is bringing fellows at their dissertating stage which may not provide enough time for many students to engage in the full program as depicted in Figure 3.

Opportunities highlight that developing collaborative relations between community colleges and senior institutions provide teaching opportunities to doctoral students can provide needed teaching experience as well as a way to promote faculty careers at those institutions. Another valuable asset is to leverage the experience of previous cohorts in mentoring and supporting new cohorts as they engage in the program.

In terms of the threats identified, the H-AGEP alliance must implement a consistent process for ensuring that all H-AGEP members are aware of their responsibilities, commitments, and involvement within the program. Having a clear understanding of the roles and responsibilities of each H-AGEP alliance member will ensure that program goals, and the grant requirements set

forth by the NSF, are met. Faculty perceptions and biases against careers at CC can result in lack of commitment and support of fellow's participation in the program. This can negatively impact the experience of the fellow in the program.

6 Moving Forward

Based on information collected during the self-study about the initial implementation of the H-AGEP model as well as the feedback generated from the SWOT Analysis, a list of lessons learned and recommendations is provided next:

6.1 Leadership

Program leadership is crucial to provide fellows with the best teaching experience and mentorship opportunity. To provide effective leadership through the implementation of the H-AGEP program, the following aspects are of utmost importance:

- Ensure full commitment from all the members of the leadership team to the goals of the H-AGEP Alliance;
- Ensure that all the H-AGEP members are fully engaged in terms of time and effort;
- Ensure that the leadership team is fully supportive of fellows with an “open door” policy;
- Ensure that the leadership team makes timely decisions based on feedback and is accountable for transparency in all program decisions.

6.2 Recruitment

The recruitment process has been modified and will now include the following activities to facilitate the recruitment of subsequent cohorts:

- Asking fellows from previous cohorts for peer references;
- Sending e-mails to STEM department chairs, graduate program director and advisors, and graduate school representatives;
- Contacting research centers that hire doctoral students;
- Advertising the H-AGEP website on social media platforms using institutional accounts and providing highlights of fellows who have participated in H-AGEP;

6.3 On-Boarding Process

The on-boarding process is a critical step for clarifying the role of each H-AGEP fellows, their dissertation advisors, and their assigned CC mentor. To complement the on-boarding process, the following recommendations are provided:

- Provide a Memorandum of Agreement that specifies clear expectations and time commitment for H-AGEP fellows, dissertation advisors, and CC mentors;
- Ensure that the following on-boarding meetings are scheduled:
 - ✓ Introductory meeting with H-AGEP alliance leadership team and new fellow cohort;
 - ✓ New fellow cohort , their dissertation advisors, leadership team, CC mentors, and teaching training coaches;
 - ✓ CC faculty mentors and teaching training coaches with leadership team;
 - ✓ New cohort of fellows with fellows from previous cohorts
 - ✓ New cohort fellows with CC faculty mentors.

6.4 Communications

The communication aspect of the H-AGEP program is critical given the number of individuals actively engaging on the different activities. To strengthen the communication among all H-AGEP members, the following to actions are strongly recommended:

- Incorporate the use of an online communication platform to create a specific space for virtual interaction and communication among all H-AGEP members;
- Establish a specific channel of communication for the leadership team members beyond e-mail;
- Provide a private channel of communication/virtual interaction for H-AGEP fellows from all cohorts to foster peer mentoring and networking.
- Provide regular email briefings with updates on program activities, and faculty and student highlights as well as employment and professional development opportunities.

6.5 Teaching Program

The teaching program is the main intervention component of the H-AGEP model, which should continuously incorporate the following aspects to complement the professional development and teaching experience of the H-AGEP fellows:

- Include online education environment and tools as a key element of the teaching experience
- Earlier engagement of fellows in deciding which class will be used for the practicum
- Provide credentials to H-AGEP fellows to access the learning management system at CC to interact with CC undergraduate students
- Provide fellows with more structured feedback on their teaching practicum

7 Summary

The partnership between senior and community colleges provide valuable opportunities for participating Hispanic doctoral students to understand academic careers at these institutions. These collaborations should be nurtured to provide teaching experience opportunities to doctoral students and awareness of career opportunities at CC. Leveling of existing resources from teaching training and professional development programs facilitate program implementation. A challenge in such a collaboration is the different cultures between CC and senior colleges and between senior college institutions such as UTEP and CCNY. Communications came as a program weakness and an area that could be a threat to the success of the program.

This paper reports on the implementation, lessons learned and recommendations from the initial implementation of an H-AGEP model. Summarizing and sharing these experiences can benefit other groups seeking to develop similar initiatives and also to obtain community feedback in improving effort like H-AGEP in the future.

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