

CGS Doctoral Initiative on Minority Attrition and Completion Implications for Practice: A Case Study of UMBC and the PROMISE AGEP



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May 28, 2015

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UMBC: An Honors University in Maryland

Understanding the Purpose of B.S., M.S., Ph.D. B.S. provides a foundation of knowledge to build on for a lifetime of learning. M.S. provides mor in one or more a include a thesis Ph.D. provides do structured r new knowledge Janet Rutledge

Graduate Diversity Initiatives at UMBC

- NIH: Meyerhoff Graduate Fellows Program
- NSF: PROMISE AGEP-T
- NSF: LSAMP-BD



<u>Fall 2014</u>

- Total Student Enrollment: 13,979
- Graduate students: 2600
- URM (not including 2 or more): 426 (16%)
- STEM URM (College of Natural & Mathematical Sciences, College of Engineering & IT): 210 (8%)



- 1. PROMISE AGEP
- 2. Texas A&M
- 3. Stony Brook/BNL
- 4. California
- 5. Michigan
- 6. CIC
- 7. Tuskegee
- 8. PNW-COSMOS

About AGEP

AGEP is committed to the national goal of increasing the numbers of underrepresented minorities (URMs), including those with disabilities, entering and completing science, technology, engineering, and mathematics (STEM) graduate education and postdoctoral training to levels representative of the available pool. URMs include African Americans, Hispanic Americans, American Indians, Alaska Natives, Native Hawaiians and other Pacific Islanders.

About PROMISE: Maryland's AGEP

University System of Maryland





PROMISE Maryland's Alliance for Graduate Education and the Professoriate





- 1. 2013: Collaborative Research: AGFP - T: PROMISE AGFP Maryland Transformation (\$1.75M)
- 2. 2011: PROMISE Pathways (\$150K)
- 3. 2008: PROMISE: Maryland's AGEP (\$1.5M)
- 4. 2002: Maryland Alliance for Graduate Education and the Professoriate (\$3.15M)



Social Science Research that Informs Practice

- 1. Psychological Sense of Community (PSOC, McMillan & Chavis, 1986)
 - 1. Membership: the feeling of belonging or of sharing a sense of personal relatedness.
 - 2. Influence: A sense of mattering, of making a difference to a group, and of the group mattering to its members
 - **3. Reinforcement: integration and fulfillment of needs:** The feeling that members' needs will be met by the resources received through their membership in the group
 - **4. Shared emotional connection**: The commitment and belief that members have shared and will share history, common places, time together, and similar experiences
- 2. Counter-Spaces (LatCrit via CRT, Solórzano, Ceja, & Yosso, 2000; Solórzano & Yosso, 2002)
 - 1. **Counter-spaces:** fostering learning, nurturing a supportive environment, validating the experiences of the participant, and viewing experiences as important knowledge
 - 2. Cultural Capital: aspirational, linguistic, familial, social, navigational, and resistant
- 3. Intersectionality and STEM Identity (Crenshaw, 1986; Hill Collins, 1998; Carlone & Johnson, 2007)

What we learned from DIMAC

- 1. All DIMAC Institutions were involved in some sort of activity for URM graduate student success
- 2. UMBC's overall graduate enrollment = 1.9% of total for DIMAC Institutions
- UMBC's URM STEM enrollment = 3.5% of total for DIMAC Institutions (over 10 yr. period)
- 4. UMBC STEM Earned PhDs = 3.5% of total for DIMAC Institutions (10 yr. period)
- 5. Some years, graduation rates are higher than others, e.g., 2010-2011 = 5.5%



What we've learned at UMBC:

Students can persist when they know that they are invited to continue to engage, regardless of enrollment status – perception of "loyalty."

Some students take longer due to family obligations, full-time jobs, change in research interest (they wait for new faculty to be hired, or take time to develop new relationships with existing faculty.

Attrition isn't always due to "failure." Cases: Different research, unique fellowship, Supportive environment + skill-building = new competencies/opportunities.

Interventions

Through PROMISE and other initiatives, UMBC developed continuous interventions to:

- Combat challenges of new/rigorous program
- Combat isolation

Some key activities:

- PhD Candidacy Ceremony
- Dissertation House
- Summer Success Institute
- Holistic Professional Development

Creating a Culture of Inclusion

- Focus on URM STEM
- Invite all to participate
- Include/invite faculty
- Share data (President's Council, VP & Deans, GPDs)

LESSONS LEARNED

- 1. Professional development is critical for graduate students
- Participants needed information in areas outside of traditional academic seminars, outside of academic departments
- People were attending the seminars for both the information and the connections (other disciplines, similar cultural backgrounds, spaces for support and encouragement)

The Dissertation House



Summer Success Institute (SSI)



Third weekend in August, Mentors-in-Residence, Three tracks: first year, continuing student, PP&P (Postdoc/professor/professional), Alumni speakers ["Alternative space," STEM identity, PSOC – Sense of Belonging]

Suite of Activities: Seminars & Workshops

- Advanced Statistics meta-analysis and structural equation modeling
- PROF-it: Professors in Training
- Responsible Conduct of Research/IRB
- Discussions with faculty panel, "When Faculty Say 'x'..."
- Dissertation House: Employees & Non-Traditional Students
- Financial Literacy (CGS EFL)
- Addressing Graduate Students' Feelings of Stress
- Keys to Public Speaking
- Career Opportunity Hiring Roundtables and Sessions
- Scientific Publishing Workshop (Co-sponsor: NIH Meyerhoff Grad Fellows)
- Career-Life Balance Seminar Portfolios (NSF CLB)
- A talk with President Hrabowski





Professional Development Seminars & Workshops: AY 2014-2015

- Saturday September 6, 2014: How to fund your graduate education
- Wednesday, September 10, 2014: Advanced Statistics for Researchers: Part 1: Introduction to meta-analysis and structural equation modeling. Basic concepts, theory, design, and relevant contexts
- Friday, September 19, 2014: PROF-it: Professors in Training: Develop a syllabus
- Wednesday, September 24, 2014: Responsible Conduct of Research/IRB
- Friday, October 3, 2014: PROF-it: Professors in Training seminar
- Wednesday, October 8, 2014: "Advanced Statistics for Researchers: Part 2: Metaanalysis and Systematic Review: Avoiding bias in literature review and calculating effect sizes.
- Friday, October 10, 2014: When Faculty Say 'x'...
- Friday, October 10 and Saturday, October 11 2014: Dissertation House: Employees & Non-Traditional Students
- Friday, October 24, 2014: PROF-it: Professors in Training seminar
- Wednesday, November 5, 2014: Part 3: Introduction to Structural Equation Modeling and Confirmatory Factor Analysis.
- Friday, November 7, 2014: PROF-it: Professors in Training seminar
- Wednesday, November 19, 2014: Financial Literacy Credit Scores
- Friday, December 5, 2014: PROF-it: Professors in Training seminar
- Friday, December 5, 2014: Addressing Graduate Students' Feelings of Stress

- **Tuesday January 20- Friday January 23, 2015:** *Dissertation House: UMBC Students*
- **Saturday, January 31, 2015:** *Keys to Public Speaking: Prepare for Your Upcoming Presentation*
- Wednesday, February 4, 2015: Career Opportunity Hiring Session: Sandia National Labs.
- Friday, February 6, 2015: Scientific Publishing Workshop (Co-sponsor: Meyerhoff Grad Fellows)
- Wednesday, February 11, 2015: Part 4: Testing the Validity of a Causal Structure.
- Wednesday, February 25, 2015: Postdoctoral Morning Coffee
- Wednesday, February 25, 2015: Career-Life Balance Seminar
- Wednesday, March 11, 2015: A talk with President Hrabowski
- Friday, April 1, 2015: Part 5: Latent Mean Difference Models.
- Friday, April 3, 2015: Postdoctoral Morning Coffee
- Wednesday, April 8, 2015: Career Paths for Graduate Students
- Wednesday, April 22, 2015: Financial Literacy Seminar

- Involve academic programs in activities
- Data is critical to track performance

Alternative Spaces – "The Jessica Effect"



The "Jessica Effect," relies upon professional development, community building, and the <u>development of an "extended</u> <u>family"</u> as factors necessary for mentoring and facilitating increases in retention, graduation, and transition to advanced STEM careers for underrepresented minorities in STEM disciplines.



Values – (FAMILY STRUCTURE)

- Shape graduate students' performance and socialization into their departments and their graduate communities.
- Different emphasis/structure among diverse groups.

Graduate students from "collectivist cultures"

(e.g., Latino, African American) place <u>strong emphasis on</u> <u>personal relationships</u> in school, which may interfere with internally focused and task-driven characteristics that are needed for graduate school success. This is different from students from an individualist culture who may instead place more focus on traditional activities associated with advanced graduate work, and less focus on relationships to others in the program (Taylor and Antony 2000; Davidson and Foster-Johnson, 2001).

"In Latin culture, family is more important than anything, even education... Ties in the family, especially among the women, are tight."

—Latina biology Ph.D. "The Jessica Effect"





- Differences in "Culture" (Mazzula, 2011)
- Crocker, J., Luhtanen, R., Blaine, B., & Broadnax, S. (1994).
 Collective self-esteem and psychological well-being among White, Black, and Asian college students. *Personality and Social Psychology Bulletin*, 20, 357–360.
- Marin, G., & Marin, B. V. (1991). Research with Hispanic populations. Thousand Oaks, CA: Sage.

Lessons Learned

* It's not just one program (departmental collaboration, critical mass and shared resources among alliance campuses)

* <u>It's more than one person: Mentoring Extensions</u> Pipeline Mentoring, Multi-level Mentoring, (University as Mentor) *Life-long mentoring, Mediator, Advocate, Constant*

* Develop a supportive environment: Identify elements that are important and develop a suite of formal support mechanisms, including activities to address academic and holistic competencies.



Emerging Themes from 15 respondents for Question 7: SOURCES OF MENTORING

- Professors from undergraduate institutions
- PROMISE: Maryland's AGEP
- Meyerhoff Graduate Fellows Program
- Department
- LSAMP Bridge to the Doctorate Program
- United Students of African Descent – USAD (at UMB)
- Southern Regional Education Board (SREB)
- Women in Business, outside of academe
- MARC U* STAR (Sponsored by NIH)
- Family
- Other African-American women
- Other graduate students

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PROMISE: Maryland's Alliance for Graduate Education and the Professoriate Enhances Recruitment and Retention of Underrepresented Minority Graduate Students

Renetta G. Jull, PhD, Janet C. Rutledge, PhD, Frances D. Carter, PhD, and Jordan E. Warnick, PhD

Abstract

PROMISE: Maryland's Alliance for Graduate Education and the Professoriate (AGEP), sponsored by the National Science Foundation, is a consortium that is designed to increase the numbers of underrepresented minority (URM) PhDs in science, technology, engineering, and mathematics fields who will pursue academic careers. A strength of PROMISE is its alliance infrastructure that connects URM graduate students on different campuses through centralized programming for the three research universities in Maryland: the University of Maryland Baltimore County (the

istorically, U.S. racial and ethnic minorities earn a disproportionately small percentage of the doctoral degrees

granted in science and engineering fields. In 1975, only 3% of U.S. science, engineering, and mathematics doctoral degrees were awarded to African Americans and Hispanics. By 1999,

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Acad Med. 2012;87:1542-1569. First published online September 26, 2012 dor 10.10971ACM.06073w31826d6796

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lead institution in the alliance), the University of Maryland College Park, and the University of Maryland Baltimore (UME), PROMISE Initiatives cover graduate student recruitment, retention, community building, PhD completion, and transition to careers. Although it is not a fellowship, PROMISE

offers professional development and skill-building programs that provide academic and personal support for URM students on all three campuses. PROMISE on UMB's campus Includes the School of Medicine, which sponsors

and wellness to accompany traditional professional development programs. PROMISE uniquely and atypically Includes a medical school within its alliance. The PROMISE programs serve as Interventions that reduce isolation and facilitate degree completion among diverse students on each campus. This article describes details of the PROMISE AGEP and presents suggestions for replicating professional development programs for URMs in biomedical, MDV masters, and MD/PhD programs on

the numbers were still low, revealing The low numbers of ethnic and that even though African Americans racial minorities in both science. represented 12% of the population, they technology, engineering, and math only earned 4% of the PhDs granted in science, engineering, and math workforce are troubling, especially fields.1 Recent numbers of doctoral degrees awarded to underrepresented minorities (URMs) within biomedical sciences are also low. In 2010, out of Regutherization Act of 2010 now directs the National Aeronautics 418 U.S. institutions granting researchdoctoral degrees, fewer than 1,000 PhDs and Space Association (NASA), the in the medical or biological sciences were awarded to URMs.2 From 2006 to 2009, there were 29,660 PhD recipients of all races in the 34 reported fields for biological sciences. Of those, 703 were African American and 995 were Hispanic.2 During the same time period, there were 3,805 PhD recipients of all races from the medical sciences, of whom 218 were African American and 100 were Hispanic. The numbers of praduates from Native American/Alaska URM students' access to advanced Native backgrounds continue to be so small that the numbers of graduates are suppressed in the data charts. This the Professoriate (AGEP)10 and the disclosure control protects the identities Louis Stokes Alliance for Minority of the graduates, but reiterates that this group is severely underrepresented in

Academic Medicine, Vol. 87, No. 11 / November 2012.

DOI:

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the sciences.4

10.1108/S1479-3644(2011)0000011013 (Permanent URL)

Volume 11), Emerald Group Publishing Limited, pp.165-209

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Replication at other schools

An AGEP Program Analysis: Minority Graduate Student Diversity in STEM Disciplines at Three Maryland Universities

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Abstract-The Alliances for Graduate Education and the Professoriate (AGEP) is a federally funded initiative facilitated by the National Science Foundation [3]. AGEP addresses the need to recruit and retain underrepresented minorities to science, technology, engineering, and mathematics (STEM) disciplines. The University System of Maryland's (USM) PROMISE AGEP-T, a transformative initiative of the AGEP, is a program that includes all of the public universities within the USM. This program started with an initial alliance between three universities: the University of Maryland Baltimore County (UMBC), the University of Maryland Baltimore (UMB), and the University of Maryland College Park (UMCP). The PROMISE AGEP requires campuses to develop activities in three focus areas: 1) new graduate student cultivation; 2) community building that supports students and helps them excel academically; 3) professional development [12]. The Universities are encouraged to collaborate with each other to support student success with the goal of promoting successful recruitment, retention, graduation, and professorial training of participants. This paper links four theoretical retention frameworks to the intended outcomes of the PROMISE AGEP. An overview of Tinto's (1993) theory of individual departure [16], Giuffrida's (2006) self determination and job involvement theories [6], Bean and Eaton's (2000) psychological model [17], and Padilla's (1997) heuristic knowledge model [14] is presented and subsequently tied to PROMISE AGEP goals and outcomes with a discussion about the usefulness of linking theory to practice.

Keywords-graduate education: underrepresented:

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INTRODUCTION AND BACKGROUND

"We must look out for America's strength in the global economy, and to do that, we must encourage untapped resources into the STEM pipeline. So many of our minority youth are not prepared to take on jobs in critical science and engineering fields, and this is a problem Congress can--and must--address."

> United States Congresswoman Eddie Bernice Johnson in a statement issued to coincide with the release of a 2008 NACME report on the flattening participation of underrepresented minorities in STEM fields [15].

As America rethinks ways to maintain its status as an economic leader in the world, United States law makers have been looking inward to the country's natural, human resources for solutions. These human resources-students between kindergarten and completion of the bachelor's degree (K-20)-are continuously moving through the educational pipeline. Their teachers and professors are charged with the task of ensuring their successes while the students pursue their formal education. The majority of kindergarten through the 12th grade of high school (K-12) students in the U.S. attend public schools, a staple institution through which the equality of opportunities for the future are touted. However, what many lawmakers know is that the K-12 public education system is on a crumbling foundation, it is a system that has to accommodate increasingly complex needs-often beyond its capacity to do so [13].

Of particular concern is the recognition that the public education system is not producing the outcomes of



Look inside ↓



Formula for Success Power and "momentum of success" equations + $\frac{\{C_1^{10}(C_2+C_3)\}}{\{C_1^{10}(A+W)\}}$ + $\frac{\{E_1^{10}(A+W)\}}{\{C_1^{10}(A+W)\}}$ (1) Power = P = {Preparation¹⁰(Passion + Persistence)} C = {Connection¹⁰(Compassion + Courage)} E = {Excellence¹⁰(Achievement + Wisdom)}. $\gamma(t) = \begin{bmatrix} t & (6 - T_1)/5 \\ t & (T_2 + \hat{P} + \hat{E})^{f/2} \end{bmatrix}$ $+ (M + T_3) +$ (R.O.C) dt (2) what you bring what you receive your environment fear factor $\gamma(t)$ = "the momentum of success" at a given time. t = the time that it takes for you to reach your academic/career goals. T_1 = timidity, hesitation or the inability to act due to fear (literally the fear factor). T₂ = talent, or the ability to understand and apply advanced math and science concepts.

- T₃ = teaching, the scope of instruction available to you.
- f = focus, the level of concentration you apply to your work.
- R = the resources, people, programs and funding that surround you and have the potential to help you.
- O = for the opportunities you have to add to your knowledge, skills and abilities.
- M = mentoring, $M = (2M_1 + M_2)$, or advice received from others who have more experience.
- P = {Preparation (Passion + Persistence)}
- $\hat{E} = \{\text{Excellence (Achievement + Wisdom)}\}$

REFLECTIONS IN DIVERSITY

C = {Connection (Compassion + Courage)}

https://promiseagep.wordpress.com/publications/



Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author and do not necessarily reflect the views of the National Science Foundation.

Acknowledgments & Contact Information

- The CGS DIMAC project
- The Graduate School at UMBC
- The PROMISE AGEP: NSF Directorate for Education and Human Resources (EHR), Division of Human Resource Development (HRD). Current projects are supported by: Collaborative Research: AGEP T: PROMISE AGEP Maryland Transformation # 1309290.
 Foundational projects were developed and implemented under HRD grant #0202169
 "AGEP: Maryland's Alliance for Graduate
 Education and the Professoriate," HRD grant #0639698 "PROMISE: Maryland's AGEP"; and HRD grant #1111217 "PROMISE Pathways."

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