Hierarchical Mentoring: An Academic Support System

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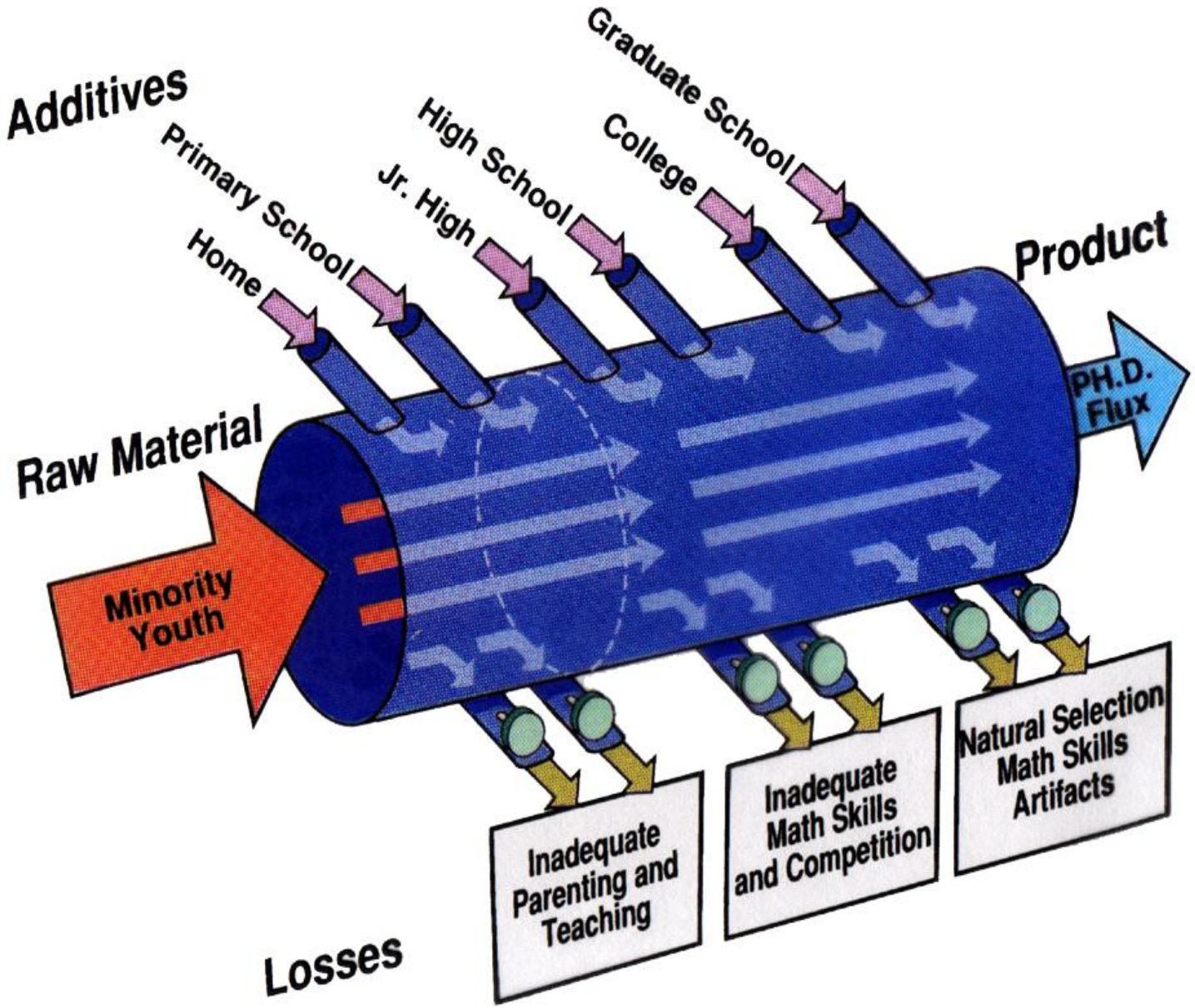
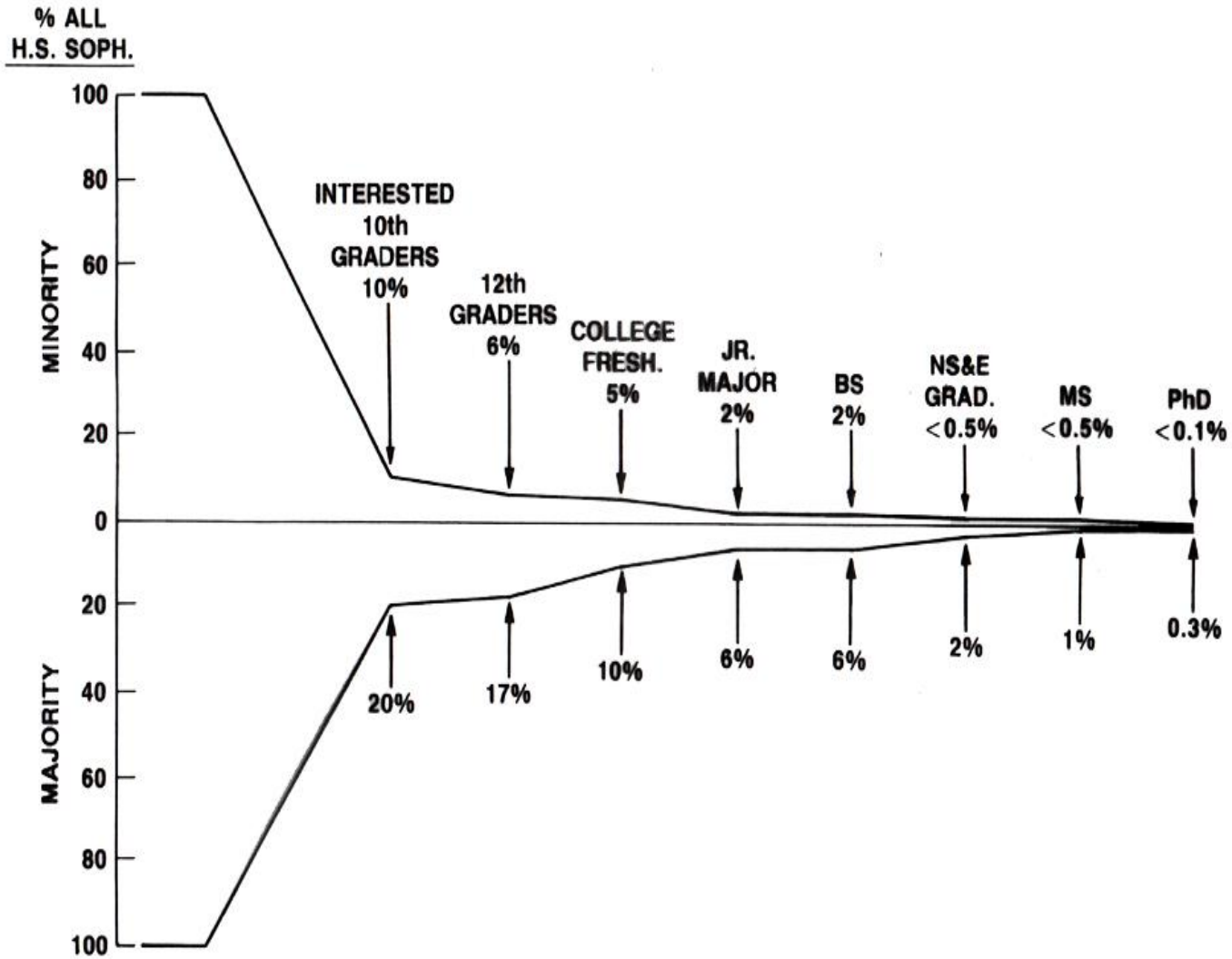
PH.D. PIPELINE FOR PROJECT 2012



James W. Mitchell, Howard University

ETHNIC GROUP PARTICIPATION IN NATURAL SCIENCES & ENGINEERING



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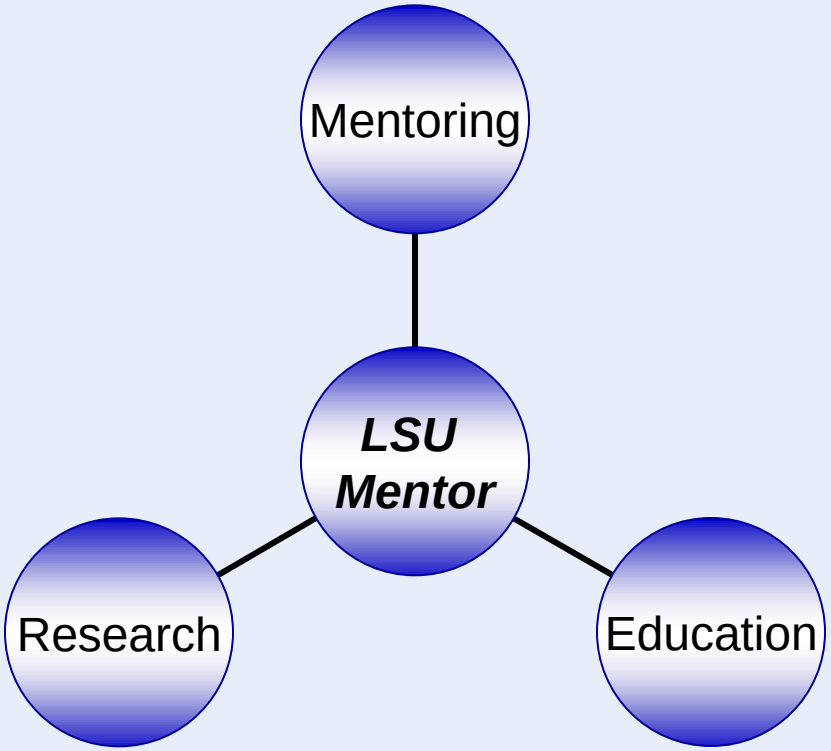
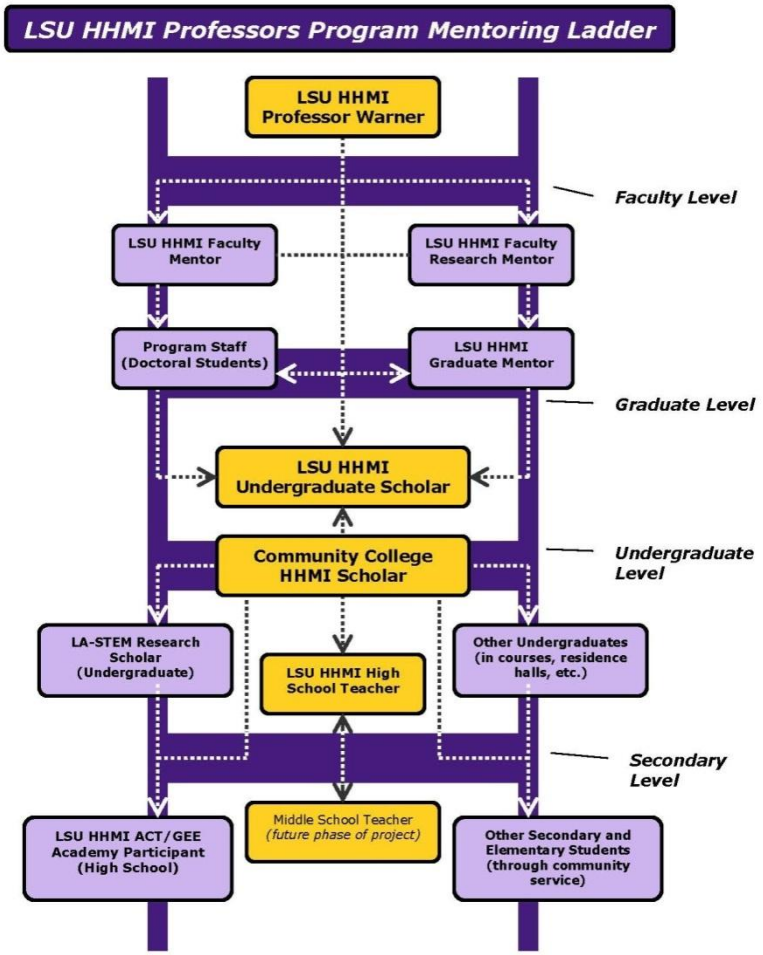
Comments on some At-Risk Students

- This student's grades do not reflect his/her true abilities.
- This student has an aptitude for science.
- This student is very interested in science.
- This student is not performing up to their abilities.
- Something is wrong?

An Innovative Hierarchy Model for Integrating Research, Education, and Peer Mentoring



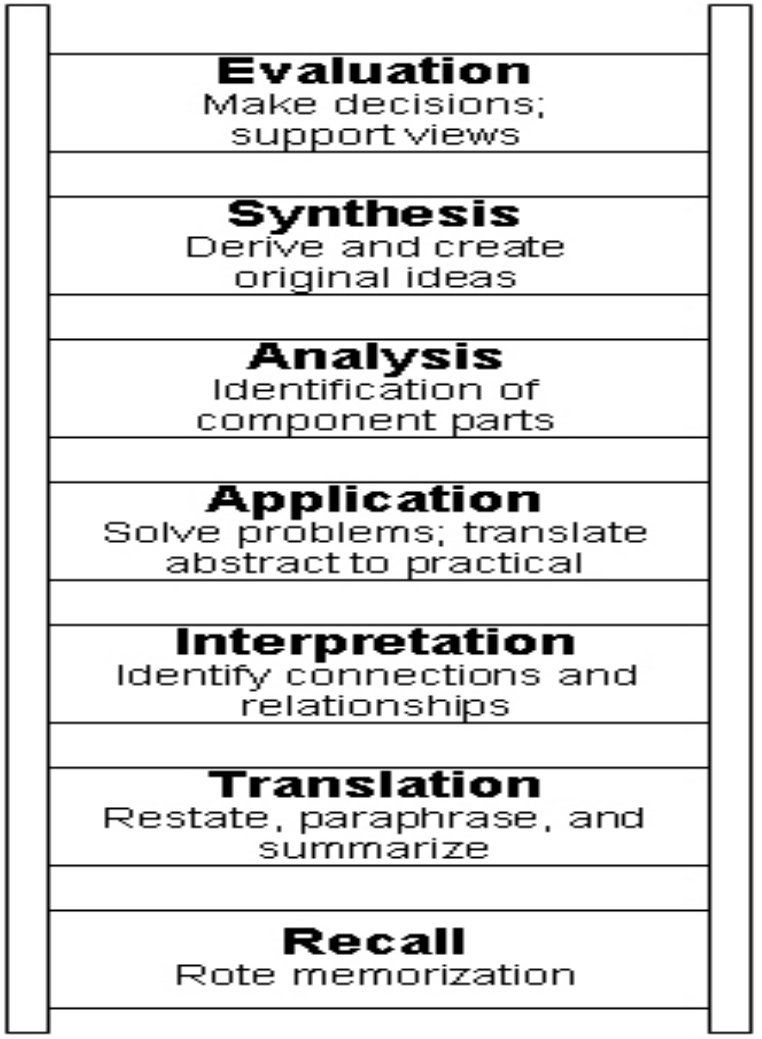
Focus on development of education, research and mentoring



Hierarchical model where students:

- Learn fundamental tools needed to excel in STEM.
- Engage in undergraduate research
- Receive mentoring from faculty
- Assigned peer mentors and mentees in their field of study
- Participate in community service
- Receive academic advising and monitoring from program staff

Bloom's Taxonomy (Metacognitive Ladder)



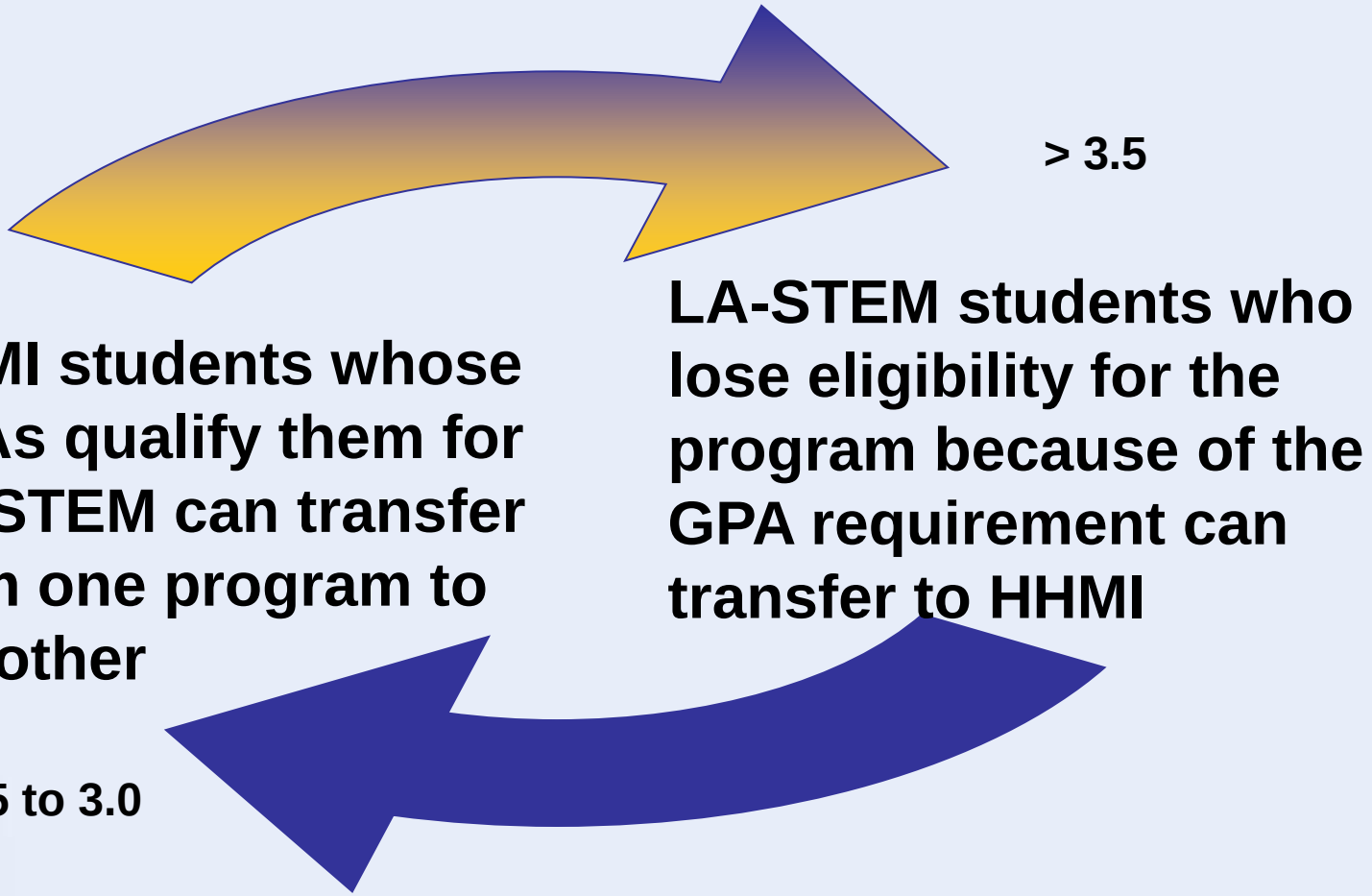
ELEMENTS OF LSU HHMI/LA-STEM PROGRAMS

- Improved Study and Note Taking Skills
- Development of Group Interaction Skills
- Improved Time Management Skills
- Enhanced Science Comprehension Through Research
- Development of Mentoring Skills

LA-STEM Research Scholars Program

HHMI Professors Program

Success through collaboration



Summer Bridge Program

- Build community
- Gain tools needed for success in college
- Serve as an intensive orientation to LSU

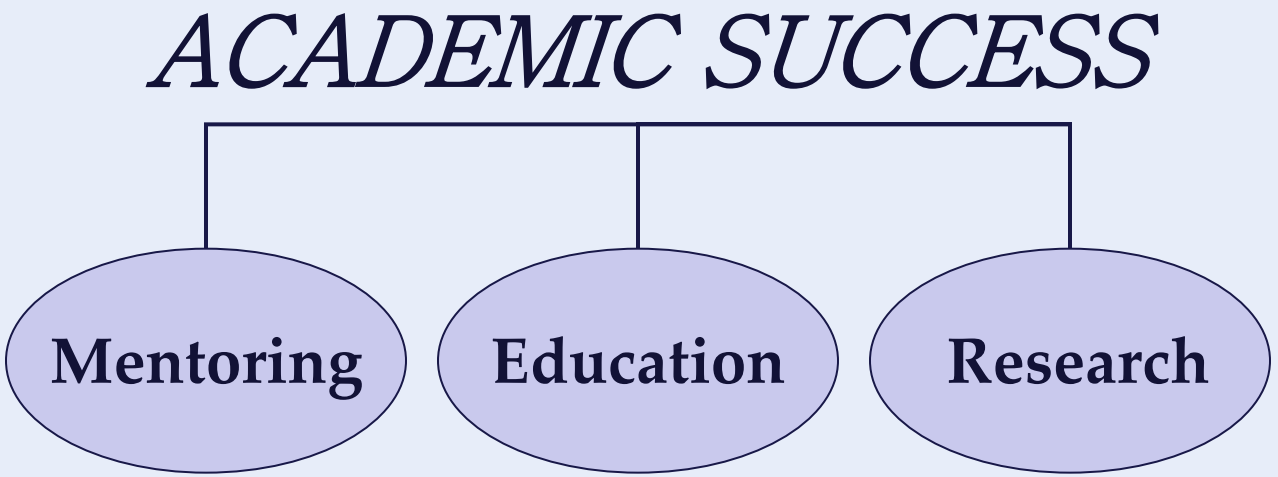
Activities

Service Learning
Outside Speakers
Workshops
Bonding Activities
Family Dinners
Research Site Trips
Credit and Non-credit courses

Summer Bridge Students
HHMI and LA-STEM

In HHMI and LA-STEM,

we provide a supportive, motivating, diverse, learning community for students which promotes academic success through a three-pronged approach:



Mentoring

Mentors function in four primary roles:

1. ***Teacher***

   imparting knowledge or skill to the mentee by example or experience

2. ***Counselor***

   exchanging opinions and ideas with the mentee to reach a decision or deliberate plan of action

3. ***Intervener***

   influencing the mentee's attitudes and behaviors

4. ***Sponsor***

   assuming responsibility for assisting the mentee in gaining greater academic success

Education

What all students need to be successful:

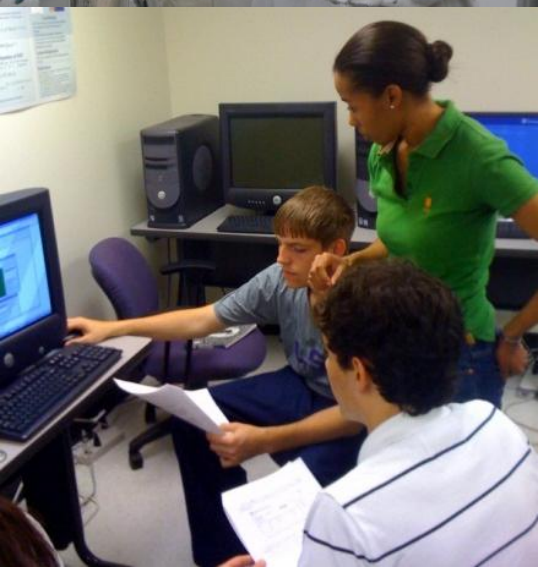
- Refined problem-solving skills
- Time management and organization
- Enhanced interdisciplinary learning
- Ability to make connections between coursework and real-world experiences
- Metacognitive abilities (learning how you learn best and monitoring your own learning)
- Writing skills (yes, even for STEM majors)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
17 Week 1 **AUGUST**	18 Orientation	19 Orientation	20 Orientation	21 Orientation	22	23
24 Week 2	25 Classes Begin	26 ***Getting On Course to your Success***	27	28 ***Accepting Responsibility & Time Mgmt: Schedules***	29	30
31 Week 3	1 **SEPTEMBER** *Labor Day Holiday*	2 ***Goal Setting & Self Motivation***	3	4 ***Self Motivation***	5	6
7 Week 4	8	9 ***Notetaking & Mentoring***	10	11 ***Study Strategies I***	12	13
14 Week 5	15	16 ***Preferred Learning Styles***	17	18 ***Self Discipline & Interdependence*** Career Fair	19	20
21 Week 6	22	23 ***Grad Student Research Presentation & Grad School Application Overview***	24	25 ***Self Awareness: Are You Off Course?***	26	27
28 Week 7	29	30 ***Mentor & Review of Midterm Study Schedule***	1 **OCTOBER**	2 *Fall Holiday*	3 *Fall Holiday* GAELA	4 Conference
5 Week 8 @ Tulane	6 Classes resume	7 ***Study Strategies II***	8	9 ***Is 24 Hours Enough?***	10	11
12 Week 9	13 **MIDTERMS**	14 **MIDTERMS**	15 **MIDTERMS**	16 **MIDTERMS**	17 **MIDTERMS**	18 **MIDTERMS**

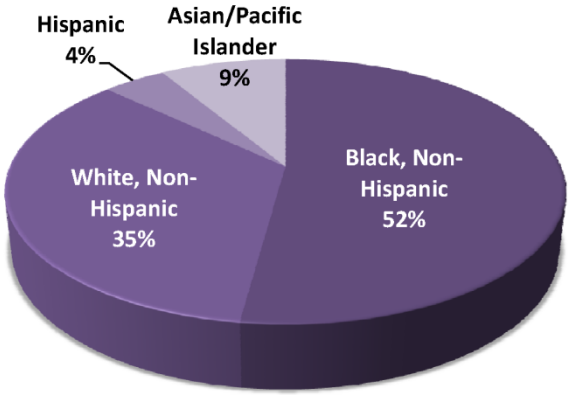
Research

Our Research students (mentors)

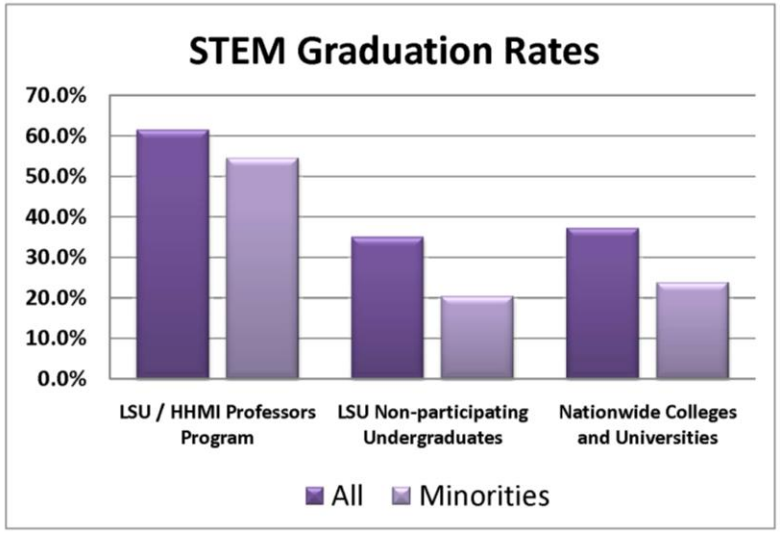
- **receive extensive preparation for research during their first semester in program or before (summer bridge)**
- **work in a research lab by their second semester in program**
- **have a research mentor to offer guidance and support**
- **have the opportunity to participate in summer research programs all over the country/world**



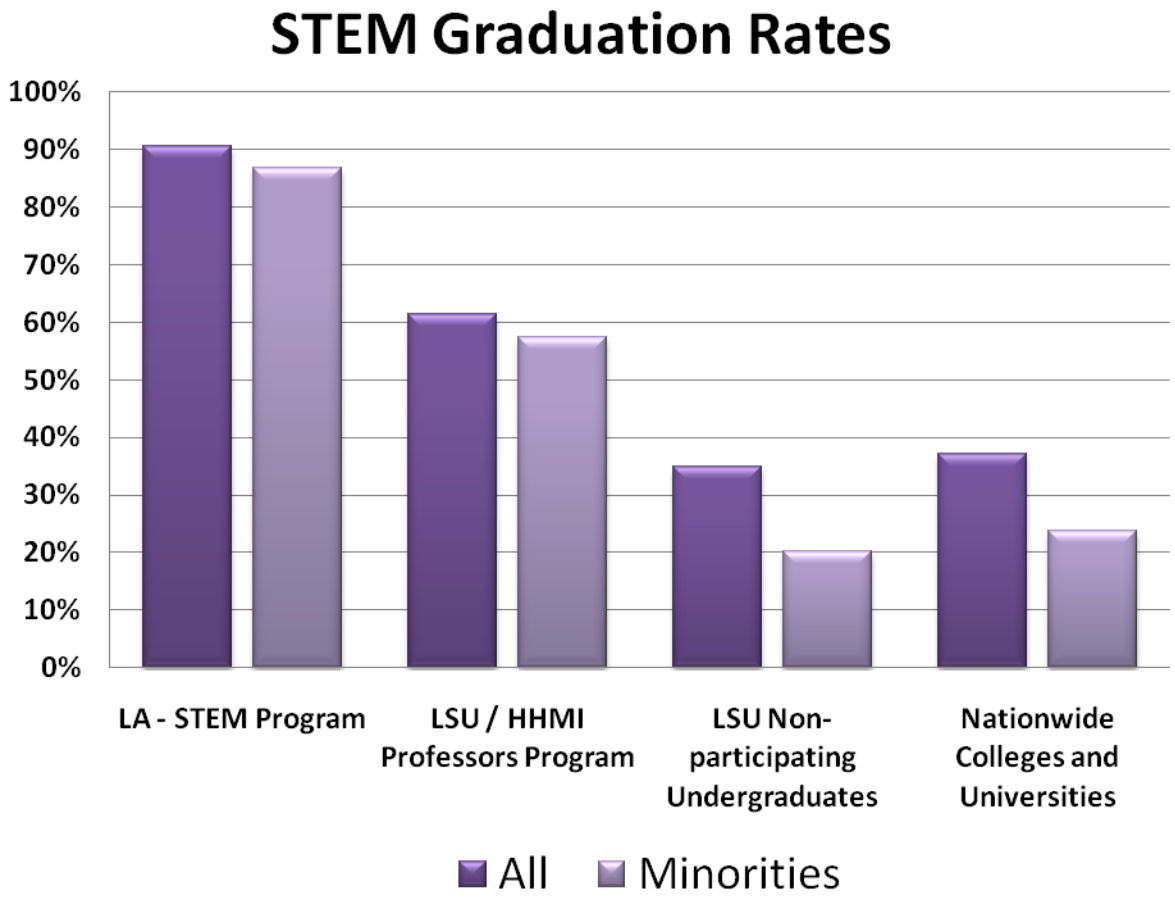
Demographics of the LSU-HHMI Scholars
By Ethnicity



Mentoring Education Research
Leadership Service



Six-year Graduation Rates for the LSU-HHMI Professors Program Scholars, LSU incoming freshmen in STEM curricular for AY 2002-2003, and national consortium incoming freshmen in STEM curricular as reported by the Center for Institutional Data Exchange and Analysis at the University of Oklahoma



LA-STEM Research Scholars
High Achieving Students
3.5 – 4.0 Undergraduate GPA

LSU-HHMI Professors Program
Underachieving Students
2.5 – 3.0 Undergraduate GPA

Six-year Graduation Rates for the LA-STEM Research Scholars Program (NSF Funded), LSU-HHMI Professors Program Scholars, LSU incoming freshmen in STEM curricular for AY 2002-2003, and national consortium incoming freshmen in STEM curricular as reported by the Center for Institutional Data Exchange and Analysis at the University of Oklahoma.

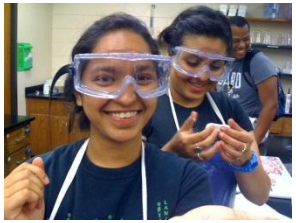
HHMI Professors Program Hierarchical Mentoring

Community College integrated into Hierarchical Mentoring Model

- Students Participate in a course on research basics
- Join a research lab during first summer in program and continue throughout fall and spring semesters
- Engage in multi-level Mentoring
  - HHMI Program Manager
  - LSU HHMI/LA-STEM peer mentors
  - BRCC Faculty
- Strong administrative support at the college and division levels

Program Impacts

- Initiated in 2007
- 13 participants thus far
- 85% BRCC participants transferred into 4-year universities as STEM majors
- 77% BRCC participants have transferred to LSU
- Served as spring board for new inter-institutional collaborations



High School

Fall and Spring Research Academy & Summer Science and Mathematics

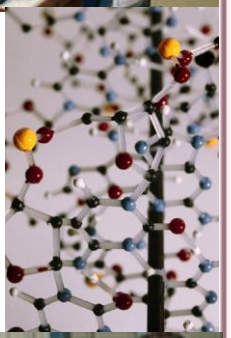
- Math and Science integrated courses (Biology, Calculus, Physics, & Chemistry)
- Teacher facilitated lab projects

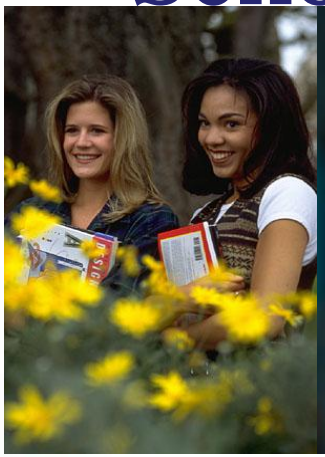
  Mentor facilitated computer training
- Mentor facilitated scientific research and exploration projects
- Science Fair/Student Poster presentations on current scientific research for SURF competition
- Weekly field trips and fun activities
- LSU faculty facilitated STEM research in labs

Summer 2010 served 21 rising 9th - 12th graders from Louisiana

LA-STEM/ HHMI

Scholars/Mentors





Louisiana State University

LA-STEM

Howard Hughes Professors Program

Research Scholars Program

Supported by

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Howard Hughes Medical Institute

NSF

LSU

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