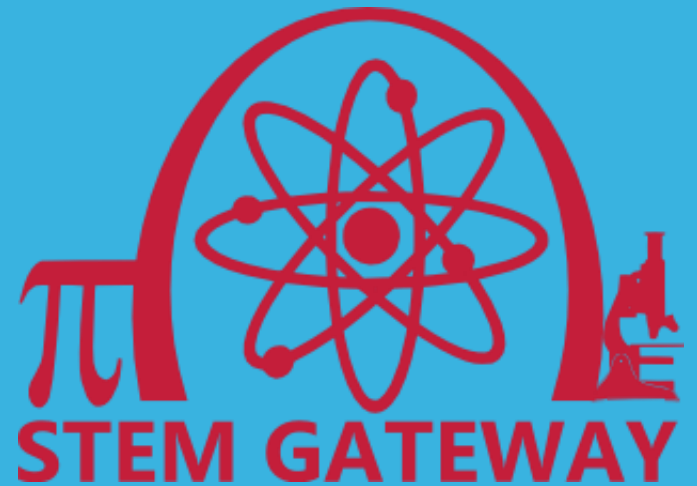


# STEM GATEWAY

DATA-DRIVEN PRIORITIZATION UPDATE

[HTTP://UNMSTEMGATEWAY.BLOGSPOT.COM/](http://unmstemgateway.blogspot.com/)  
(RESEARCH TAB)

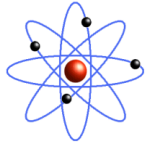


# SPECIAL THANKS TO...

- **Vicky Dueer**, Former Senior Institutional Researcher, UNM Office of Institutional Analytics
- **Patrick Coulombe**, Graduate Assistant, STEM Gateway
- **Ashley Yoder**, Graduate Assistant, STEM Gateway
- **Terry Turner**, Director, UNM Office of Institutional Analytics

# RESEARCH PROJECTS

PAST - CURRENT - FUTURE



# **STOP, SHIFT OR GRADUATE: STEM UNDERGRADUATE DEGREE COMPLETION PATTERNS AT THE UNIVERSITY OF NEW MEXICO**

This study explores STEM degree completion patterns through two primary lenses:

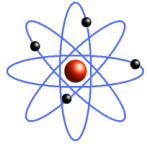
- **Degree outcomes.** How do undergraduate students who graduate with STEM degrees differ from those who switch majors out of STEM, and from those who stop attending UNM prior to completing their degrees?
- **Course outcomes.** How do undergraduate STEM students perform in the core math & science gateway courses that lead into their STEM degrees?

# KEY FINDINGS

- *Students may not know what they want to be when they originally declare a major.*
- *The status quo is not highly effective for traditionally underrepresented STEM students. And the proportions of traditionally underrepresented students are growing at UNM.*
- *Students are struggling to get through the pre-calculus math sequence.*
- *When students give up on UNM or on their STEM degrees, they usually do so early in their educational careers.*
- *UNM may need to help students understand the value of mastery (“A” level grades) in their STEM gateway courses.*
- *Most UNM students currently take longer than four years to earn STEM bachelor’s degrees.*

BRIEFING AVAILABLE ON THE STEM GATEWAY WEBSITE

<http://stemgateway.unm.edu>



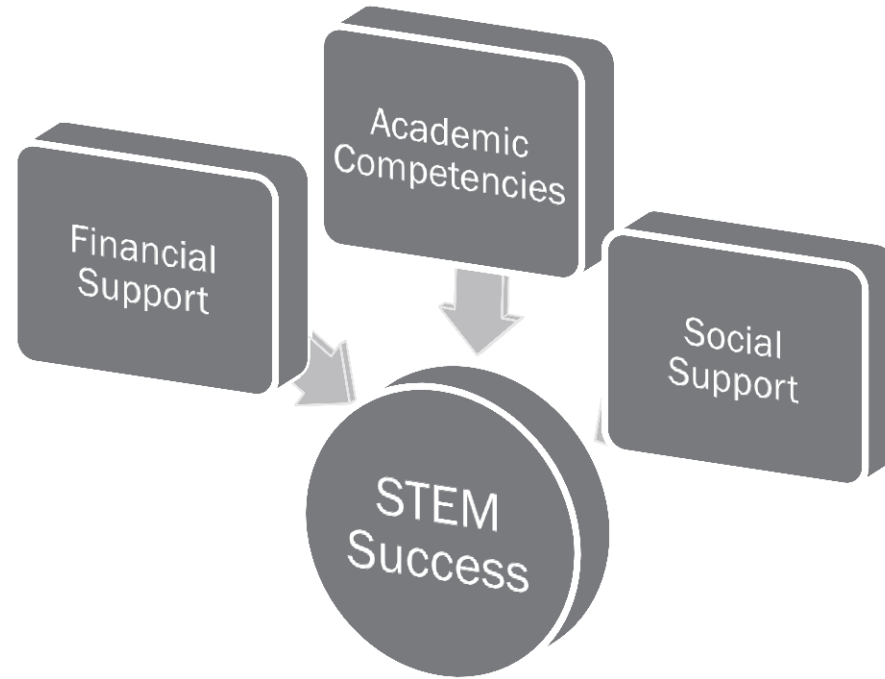
# QUALITATIVE STUDY: EXPERIENCES OF UNM HISPANIC STUDENTS IN STEM PROGRAMS

## Research Questions:

- As perceived by the subjects of this study, what factors that contribute to Hispanic students' completion of a STEM degrees at UNM?
- As perceived by the subjects, what obstacles do Hispanic students encounter in the STEM programs at UNM?

21 Interviews were conducted with Hispanic former UNM STEM students, including students who dropped out, switched majors and graduated in STEM

# KEY FINDINGS

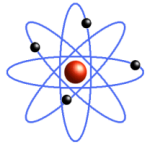


# ***KEY FINDINGS***

- Access to Financial support, Social support, and Academic Competencies appear necessary for success.
- These lines of support may vary in strength, but all are necessary
- When two lines are cut off, chances of student success diminish greatly
- When social support overlaps with the development of academic competencies, the results are positive
- Full-time work can benefit students; it can also present obstacles
- Ethnic & Racial differences struggle to find a place in STEM departments. Latin@ difference is disfavored; mainstream characteristics are favored

FULL PRESENTATION AVAILABLE ON THE STEM GATEWAY WEBSITE  
<http://stemgateway.unm.edu>



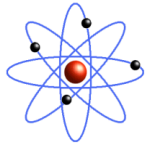


# GRADE DISTRIBUTION REPORT IN “MYREPORTS” (DATAMART PROJECT)

Restricted-access query that shows grade distributions for individual course sections, disaggregated by ethnicity and Pell-eligibility.

As a result, a department chair or academic administrator can quickly pull the course completion rates, “A” grade rates, and success rates (“C” or higher) for any set of courses.


Report tool has been made available to Course Redesign Council members and their designees.

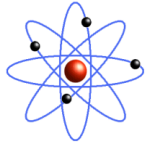


# **COURSE ON COURSE IMPACT REPORT FOR MATH 121 SECTIONS**

Implemented a model for measuring the success of an individual MATH 121 section based not solely on student grades in that section, but also on grades in subsequent math and science courses that build on foundational MATH 121 concepts

# KEY FINDINGS


- *Student achievement outcomes vary by instructors. Some instructors had consistently high results, while others had consistently low results.*
  - *Student achievement outcomes vary within instructor sections. Some instructors had somewhat inconsistent student outcomes over time.*
  - *Student achievement outcomes vary by semester. Fall students performed consistently higher than spring students.*
  - *There is no significant correlation between the success percentage of a MATH 121 section, and the success of that section's students population in later courses. In other words, utilizing the MATH 121 grade as an indicator of preparation for later courses is not supported.*
  - *Of the five highest performing MATH 121 instructors, four were members of the MATH 121 course redesign team and utilize active learning techniques.*
- 

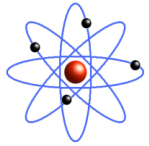


# PHYSICS PRE-REQUISITE STUDY

Analysis of student data to help propose General Physics pre-requisites that are more predictive of student success.

# KEY FINDINGS

- *Variation in grades is strongly connected to instructors. Some instructors have higher success rates (or different grading standards) than others*
  - *There is no significant difference in Physics success for students who complete Calculus at CNM versus UNM*
  - *There is no significant difference in Physics success for students who complete Calculus simultaneously with Physics, compared to those who complete it prior*
  - *At this time, we were unable to identify any pre-requisite variables that are likely to improve success. Analysis is ongoing.*
  - *Through this process, we developed a “Cost/Benefit” tool to evaluate changes in pre-requisites*
- 

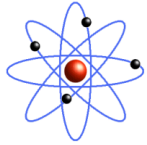


# **MATH ENROLLMENT FOR FIRST SEMESTER STUDENTS AT UNM**

Analysis of which math courses first semester freshmen enroll in at UNM.

# KEY FINDINGS

- *17% of first-semester students enroll in Intermediate Algebra, and 17% enroll in College Algebra*
- *6% of first-semester students enroll in calculus or beyond*
- *22% of first-semester students do not enroll in any math or ISM course*



# FUTURE RESEARCH PROJECTS

## STEM EXPERIENCE FOR STUDENTS WHO TRANSFER INTO UNM

- Design and collect new data to understand this STEM experience from the transfer perspective

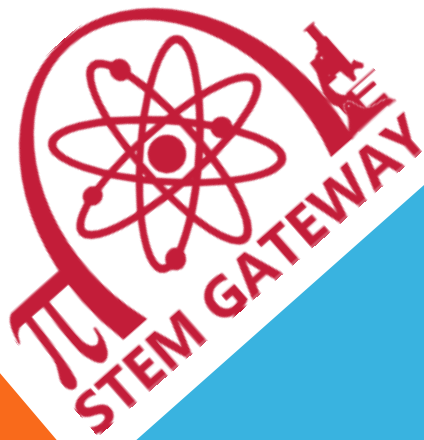
## PRE-CALCULUS MATHEMATICS EXPERIENCE AT UNM

- Analyze student data related to pre-calculus mathematics at UNM

## COURSE-ON-COURSE IMPACT MODEL DATAMART QUERY

- Create a DataMart query that allows academic administrators to pull their own course-on-course impact data





*Thank You*