



**Holistic Modeling of Education (HOME) Project
Launch Meeting
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- **HOME Project Team**

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Project Vision

The **HOME** project will:

- lead to improvements in teaching and learning in higher education by creating a holistic learner model
- uncover the connections between student behavior and success to develop instruction tailored to the specific needs of *all* students

Research Focus: 3 Core Projects

- Project 1 – Understanding the relationships between learner behaviors and academic outcomes
- Project 2 – Creating a semantic knowledge base from natural language text and structured data
- Project 3 – Supporting new evidence-based representations of learning

Contributing to UM Data Science Capacity

HOME uses data drawn from UM's learning technologies and related information available in the student data warehouse and vendor tools

- grades and all student records (admissions, registrar)
- written evidence of learning (essays and assignments)
- temporal interactions (e.g. engagement with course resources and tools)

Project 1: Understanding the Relationships of Student Behaviors & Academic Outcomes

- RQ 1** How are student interactions within technology predictive of educational attainment over a semester?
- RQ 2** How can peer matching techniques within classroom writing technologies be used to measure, and increase, the impact of diversity of student learning?

Project 2: Creating a Semantic Knowledge Base from Natural Language Text and Structured Data

- RQ 1** How can the diverse forms of knowledge representation be unified such that queries can be written across these representations?
- RQ 2** How can linguistic data be integrated across datasets and learning analytics projects?

Project 3: Supporting New Evidence-Based Representations of Learning

- RQ 1** How can evidence from written work be presented in a way such that instructors can compare outcomes with objectives?
- RQ 2** How does evidence from written notes allow instructors and advisers to understand the ability of learners within a course?
- RQ 3** How can writing in large classes (e.g. STEM) be quickly synthesized by an instructor?

HOME Goals: Year 1

- **Project 1** – Build baseline models of student success, create virtual relational data store, execute Study 1
- **Project 2** – Build demonstration semantic knowledge base, populate with achievement data & textual data, train models
- **Project 3** – Identify sources for textual data, develop prototype dashboards, pilot dashboards

HOME Goals: Year 2

- **Project 1** – Refine models of student success, refine virtual relational data store, execute Study 2
- **Project 2** – Develop an AWS for META, deploy campus-wide
- **Project 3** – Deploy 2nd generation dashboards, connect data to other behavioral data sources from Project 1 and semantic db from Project 2

Long Term Goals for HOME

- Providing an integrated **student data ecosystem** for research leading to student success
- Create **unique a test bed** for investigating student learning, including text processing and real-time applications
- Protect **student privacy** while maximizing usefulness of data
- Demonstrate **value and scalability** of existing and future high-value applications

HOME: Path to Sustainability

- Local Infrastructure: Partnership with ITS, Office of Academic Innovation
- Future funding: NSF, Gates, Sloan
- Beyond UM: UNIZIN partners, Instructure (Canvas), Echo 360