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