



MLSA An assessment disconnect

- One part of assessment is solidly built into our practice: grading in our courses
- Within a course, a rich and comprehensive body of assessment material is assembled and carefully reviewed
- Right now, this material is summarized and recircled only as a grade, with 13 divisions (A+ -> E)
- For most faculty, our classroom is all we see of a student
- We don't know where they came from
- We don't know where they go to
- We can't see how their preparation affects their performance in our class, or how their work with us affects their future

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MLSA An assessment disconnect

- Institutionally, UM assembles a portrait of the student and a record of their progress
- This includes admission info, course selections, in sequence, with performance assessed only by grades
- It includes *some* information about extra-curricular activities
- This institutional data provides our only current career-long picture of students
- For too long, this information has been inaccessible to most faculty
- This institutional portrait may still be inadequate for some purposes, and we should work to fix this

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MLSA What might you want to know?

- How strong are course interconnections among the divisions (humanities, social sciences, natural sciences) compared to connections within them?
- What factors in a student's preparation most seriously affect their performance in a particular course?
- What are the grade distributions for a particular course, sequence, or concentration?
- Which courses are students taking concurrently with (or subsequent to) a particular course?
- How are all of factors changing with time, and why?

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MLSA Course questions

- At the start of a class: very little information: names, IDs, pictures
- At the end of a class: a suite of student work, hints at what they've learned, summarized as a grade
- Who is taking this class?
 - What background do they have?
 - What else are they taking now?
 - Where are they headed after this course?
- How does background affect student performance?
 - What students are almost certain to do well?
 - What students are at risk from the start?
 - How could you help both?
- How does this class connect across the curriculum?
 - What should students bring to the class?
 - What should students take up future courses?

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MLSA Concentration questions

- What background do eventual concentrators bring to the university?
- How do they differ from other LSA students? Why do they select your concentration?
- What is the grade history in your courses? What affects this?
- How do your courses affect one another? Which courses are most important for overall success?
- Are you using AP credit appropriately?
- How do the programs of successful and struggling students differ?

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- How do students meet the various college-level requirements?
- Are these approaches consistent with the aims of the requirements?
- What do students pursue that we do *not* require?
- How do participants in living-learning communities compare to the rest of the student body?
- How does participation in extracurricular activities affect student outcomes, from concentration choice to GPA?

- Complexity of data gathering used to seem an insurmountable barrier
- Institutionally, large quantities of data are collected already
- These contain much of what we might want to examine
- They probe history too, already for more than a decade...
- Recently, efforts have been made to put this data in the hands of faculty and programs
- Existing data cannot answer every question, but...
- Faculty have a special responsibility to ask questions, help digest, and act on this information

- M-Pathways: created a stable, integrated environment for records
- An extensive portrait of every student back to ~1996 is in this system
- Access has been limited to M-Pathways trained staff
- Access to this data provides faculty with wholly new tools for assessment
- We need to work with data professionals to define tools which allow us to easily address our most important questions

- In 2002, a committee was formed to approach this problem: LSA-MAIS Pilot User Group
- Their report provides an excellent overview of this problem, along with steps toward a solution

Access to M-Pathways Student Academic Records: Knowledge Acquisition for the School of Literature, Sciences and the Arts

Interim report of the LSA-MAIS Pilot User Group (PUG)
25 Nov 2002 (Appendix B added 10 April 2003)

Brian Coppola, Professor of Chemistry
Richard Canary, Professor of Mathematics
Richard Gonzalez, Professor of Psychology
August Evrard, Professor of Physics and Astronomy (Chair)
Joan Masters, MAIS Technologist
Mark Newman, Assistant Professor of Physics and Complex Systems
Kerby Shedden, Assistant Professor of Statistics
Paul Robinson, University Registrar
Rob Wilke, LSA Information Systems Services Manager
Virginia Reese, LSA Academic Advising Counselor

Abstract. We offer a rationale for improved use of student academic record and curriculum data by faculty and administrators and describe a prototype information system designed to meet this end. The system will: i) provide annual, summary reports of base statistics to chairs and directors, ii) offer faculty real-time access to and descriptive analysis of student enrollments and performance, iii) search for patterns in course selections by students and iv) enable general clustering and trend analysis in the academic behavior of the LSA student body.

- Annual summary reports for departments and programs
- Online Reporting tools for administrators and individual faculty

Enrollment/Grade summaries:
by level (100, etc.)
+ current terms
+ historical record

Enrollment/Grade summaries:
select courses
+ current terms
+ historical record

Concentrator summaries:
+ current terms
+ historical record

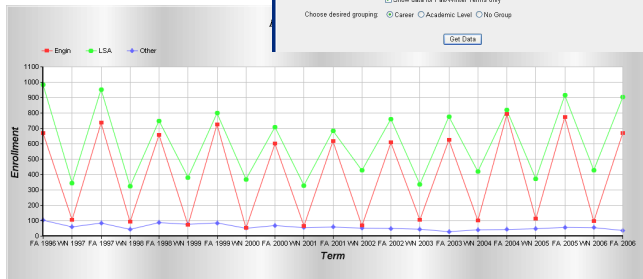
Optionally break down by:
- career
- academic level
- gender
- concentration
- other

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<https://www-a1.lsa.umich.edu/AdminData/artmain2.aspx>

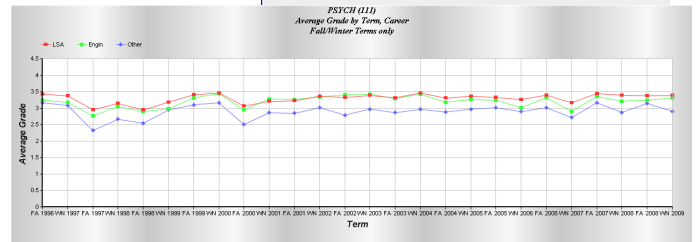
ART Online Reporting

Enrollment histories



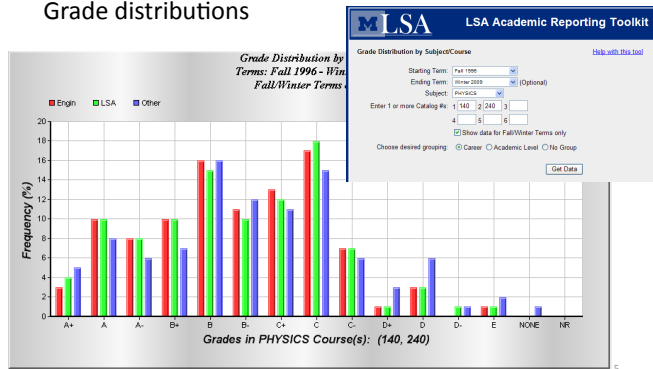
ART Online Reporting

Grade Histories



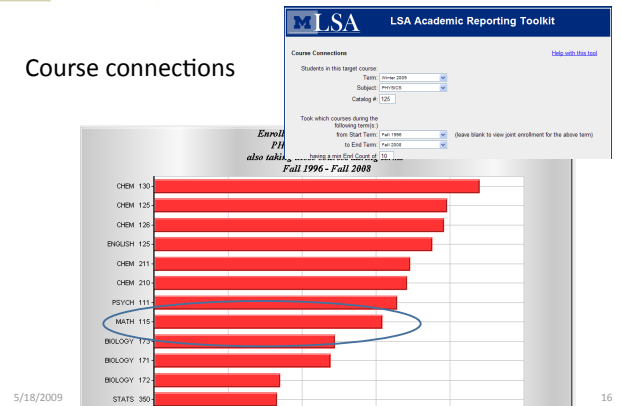
ART online reporting

Grade distributions



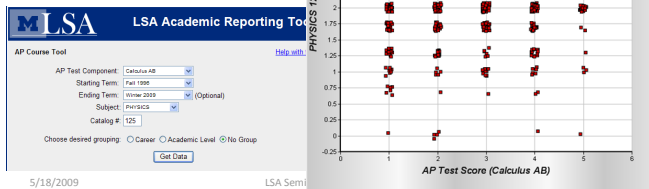
ART Online Reporting

Course connections



ART Online Reporting

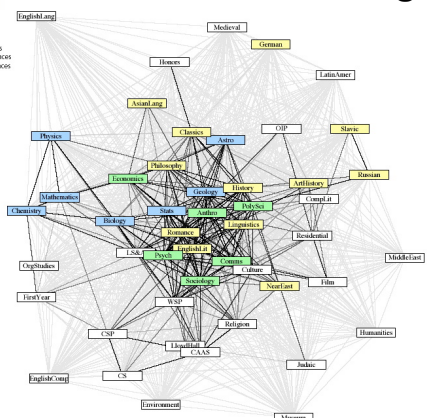
Meaning of AP exams for student performance in later courses...



ART course clustering

Programs connected based on dual enrollment in excess of that expected from random chance.

Analysis from Sheddin, Newman, Wilke and Evrard



Two personal examples

1. Who's going to do well: a grade prediction project
 - Physics Department historical study aimed at connecting input properties of students to final grade
 - Course oriented joint project with Evrard and Gerdes
2. Does the Honors Program successfully pick incoming students who will be successful in their first year?
 - Comparative study of students who enter through freshman honors and those who don't

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Who does well?

- We want to map the incoming student (represented by many aspects of preparation) to the output grade
- This tells us two things
 - What preparation matters?
 - How does what we do affect outcomes, and for whom?
- To do this, we have
 - Defined parameters we suspect might matter at input
 - Extracted these, along with final grades, for 35,000 students taking intro physics over the last decade
- We are now constructing models to map input to final grade

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Parameters available

Information about student in the course

Course number
Semester
Instructor name
Q1, Q2, Q3 scores for the class

Incoming information about the students

High school GPA
SAT and ACT
State and Country of origin
First generation college student?
Socio-Economic Status
Admission rank
ID
Gender

UM information at start of term

Cum GPA
Number of credits at Michigan
Number of transfer credits
How many credits in math
How many credits in science (Physics, Chem, Geo, Astronomy, BIO, Engineering)
GPA in math and science
Age on arrival to the class
Athlete status

Information at the end of the term

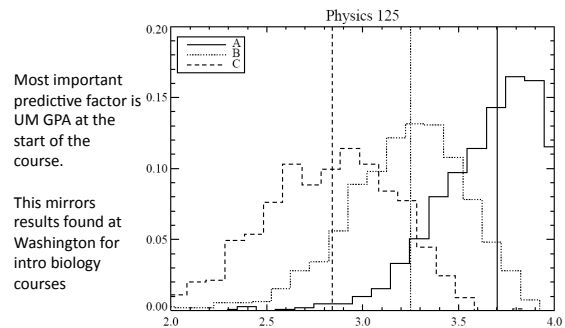
Grade in this course
Number of credits in this term
GPA in this term

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What we're finding

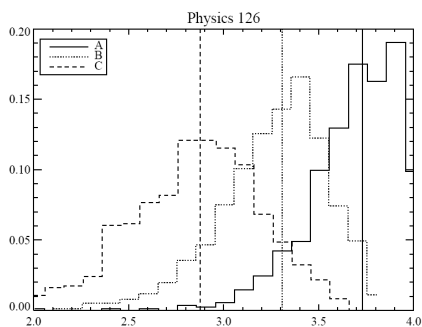


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What we're finding

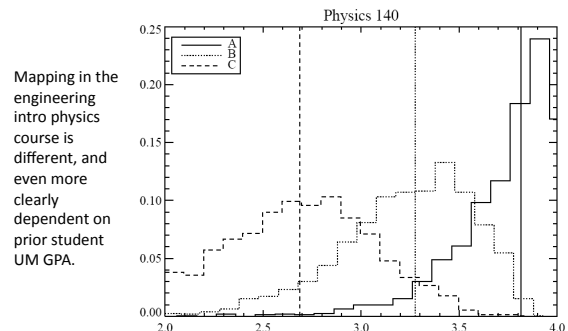


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What we're finding

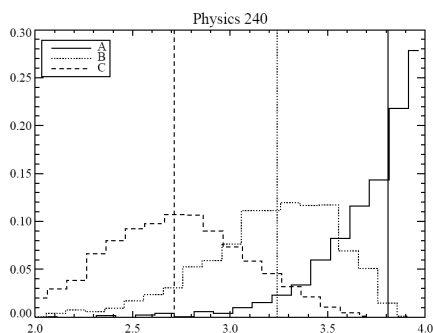


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What we're finding



What we're hoping to learn

- Historical studies: how do the maps from input student to output grade **change** with:
 - Instructor
 - Course evaluation
 - Time (HS grade infl?)
 - Mechanics vs. E&M
 - 125/126 vs. 140/240
- Preparing for the future
 - Put in place the ability to probe the differential effect of course changes on high performers and at-risk students independently
 - Define factors which lead to success, and feed them back to advising

Honors for freshmen

- Students selected from UM accepted pool
- ~1500 HP essays received
- ~500 students selected
 - Number is limited by space restrictions...
- Roughly 10% of LSA students
- Are we selecting well prepared, motivated students?
 - 76% are at 3.5+ after first year (32% in LSA)
 - 34% are at 3.8+ after first year (11% in LSA)
- We don't identify all top performers: among the 3.8+, 163 are in 1st year Honors, but 394 are not

Data is important and available!

- Much of what we do is little examined
- Existing M-Pathways data are very underutilized by interested faculty
- More users will generate better, more powerful, access tools
- Many questions cannot be answered with existing data
- It is our job to identify new, better forms of data, and to convince the institution to begin collecting these...