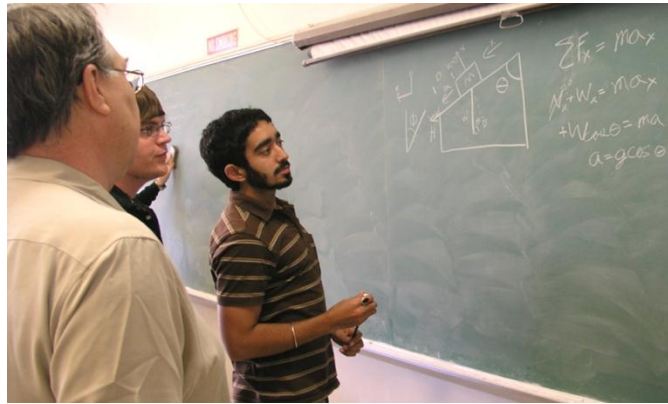


## S&T's Learning Enhancement Across Disciplines Program: Academic Assistance for Your Students



Ron Bieniek

Professor of Physics

Director of Learning Enhancement Across Disciplines

Director of New Faculty Programs

bieniek@mst.edu

S&T New Faculty Orientation

August 16, 2012

# LEADing the Way to Student Success: S&T's Learning Enhancement Across Disciplines Program

... provides proactive learning-success support for all students in foundational courses

- Offers **faculty-run Learning Centers** and **peer tutoring** that:
  - are welcoming with no stigma implied
  - promote student-centered learning
  - increase understanding of course material
  - enhance analytical and proficiency skills
  - validate mastery
- Empower students through personal achievement and assured confidence (Bandura's **validated** self-efficacy, producing greater motivation and effort)
- “You have the ability to succeed; we will guide & assist you”
- LEAD employs ~30 accomplished undergraduate Peer Learning Assistants (PLAs) who undergo extensive training in pedagogy and leadership



## Statement about LEAD for your Syllabus

The Learning Enhancement Across Disciplines Program (LEAD) sponsors free learning assistance in a wide range of courses for students who wish to increase their understanding, improve their skills, and validate their mastery of concepts and content in order to achieve their full potential. Check out the online schedule at <http://lead.mst.edu/assist>. Look to see what courses that you are taking have individualized LEAD peer tutoring and/or faculty-run collaborative LEAD learning centers for guided learning.

FYI - general LEAD website: <http://lead.mst.edu>

## Free walk-in LEAD Peer Tutoring

- Conducted by accomplished undergraduate Peer Learning Assistants (PLAs), paid and trained by LEAD
- Provides 4 – 8 hours/week of peer tutoring at scheduled days & times (generally in room 208 Norwood) for 25-30 large-enrollment foundational courses
  - prior semesters archived at [lead.mst.edu/assist/archive.html](http://lead.mst.edu/assist/archive.html)

- Always includes:

Chem 1 – 3

Comp Sci 54,74,78

Math 2 – 22

MechE 219,227

Physics 21 – 35

### Advantages of tutoring

- Quiet, calm environment
- Focused personal attention by trained undergrad peers

### Disadvantages or barriers

- Low level of camaraderie, socialization
- Only a relatively few students are helped
- **No interaction with faculty**

## Effective use of your office hours: run a LEAD Learning Center!

- Students are generally loath to enter the office lair of a faculty member for a variety of reasons
- Have office hours (~2 hours/week) in an open “inviting” environment of a LEAD Learning Center
- NOT recitations sections or “help sessions”
- Rather Learning Centers offer collaborative “guided learning”
- Reasons to do it: you will see
  - the homework done, lessening your need to prep
  - gain insight into student misunderstandings & difficulties
  - have fun interacting with greater numbers of students
  - have less complaints and issues from students
  - **You will project that YOU CARE about your students**

## LEAD Learning Center Characteristics

- Operate during fixed hours each week for a specific course
  - location chosen by faculty (generally in department bldg)
- Staffed by
  - discipline-based faculty **as office hours** in an open environment
  - accomplished, trained undergrad peer instructors (large courses)
- Facilitate and project learning-centered education
  - more student-oriented, less teacher-centered
- Utilize social dynamics & camaraderie for learning success
- Directly promote best practices for student learning
  - *Seven Principles for Good Practice in Undergraduate Education*  
(<http://lead.mst.edu/sevenprinciples/commentary.html>)

### **Students who regularly participate do significantly better**

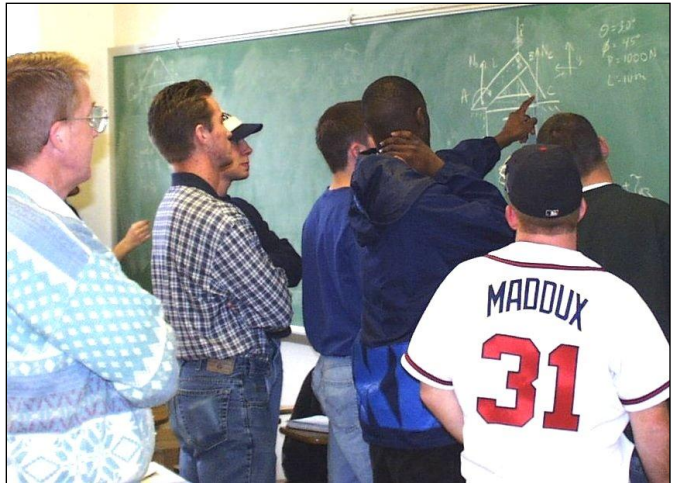
Data collected in physics, chemistry, and mathematics clearly demonstrates positive impact on student performance and grades

## Course-Based Faculty-Run Collaborative LEAD Learning Centers at Missouri S&T

- Collaborative learning with LEAD faculty on duty **as office hours** using guided-learning techniques
- 45+ faculty run 35+ learning centers in 12+ departments
- **Minimal disruption of department infrastructure**
- **Financial cost is ZERO except for any (low cost) undergrad assistant on duty with a faculty member**
- From *Elementary Russian* and *Financial Accounting* to *Electromechanics* and *Quantum Chemistry*
- Approximately 40% of students in a course attend its learning center for ~3 hrs/wk
  - ~700 students/week vote with their feet to find success through these effective learning communities



# Unposed photos of Cooperative Learning and Social Dynamics in the introductory Physics, Math, & Chemistry Learning Centers



Engineering Physics Learning Center



Calculus II Learning Center



Chemistry 1 Learning Center



Engineering Physics Learning Center

## Suggestions

Cookies  
Pop corn

Appropriate  
operating  
days/hours

Easy access  
& EGRESS

Zero or small  
% points for  
participation



*LEAD Centers*

There are so many problems  
but Chemistry  
has  
solutions

*LEAD Tutoring*

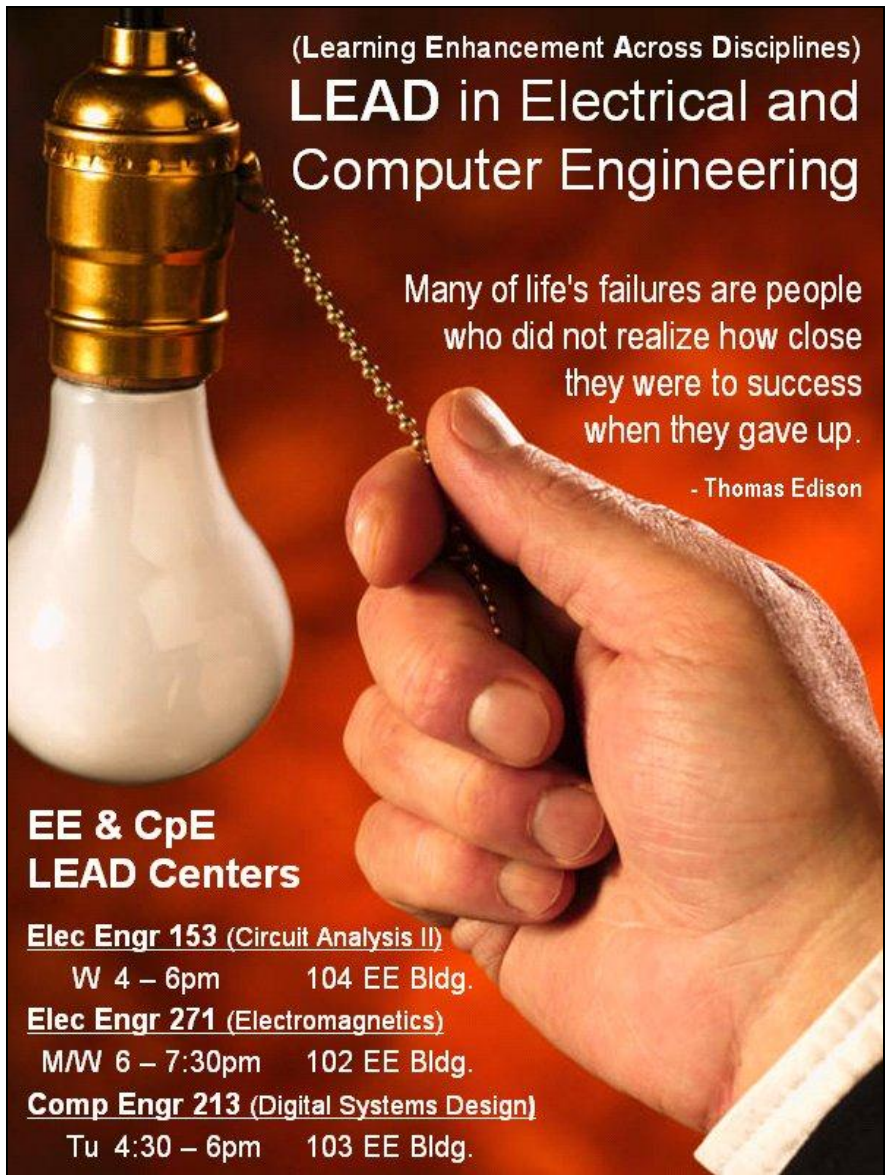
Learning Enhancement Across Disciplines

**SPRING 2009 LEAD Centers:**  
**Chem 1:**  
Tu W 3-4:30 pm  
126 Schrenk Hall  
**Chem 3:**  
M 4-6 pm  
139 Schrenk Hall  
**Chem 444 (Spectroscopy):**  
M 2:30-4:00 pm  
208 Norwood Hall  
**Chem 455 (Chem Spectroscopy):**  
Tu 4-5:30 pm  
104 Eng Mgmt



(Learning Enhancement Across Disciplines)  
**LEAD in Electrical and Computer Engineering**

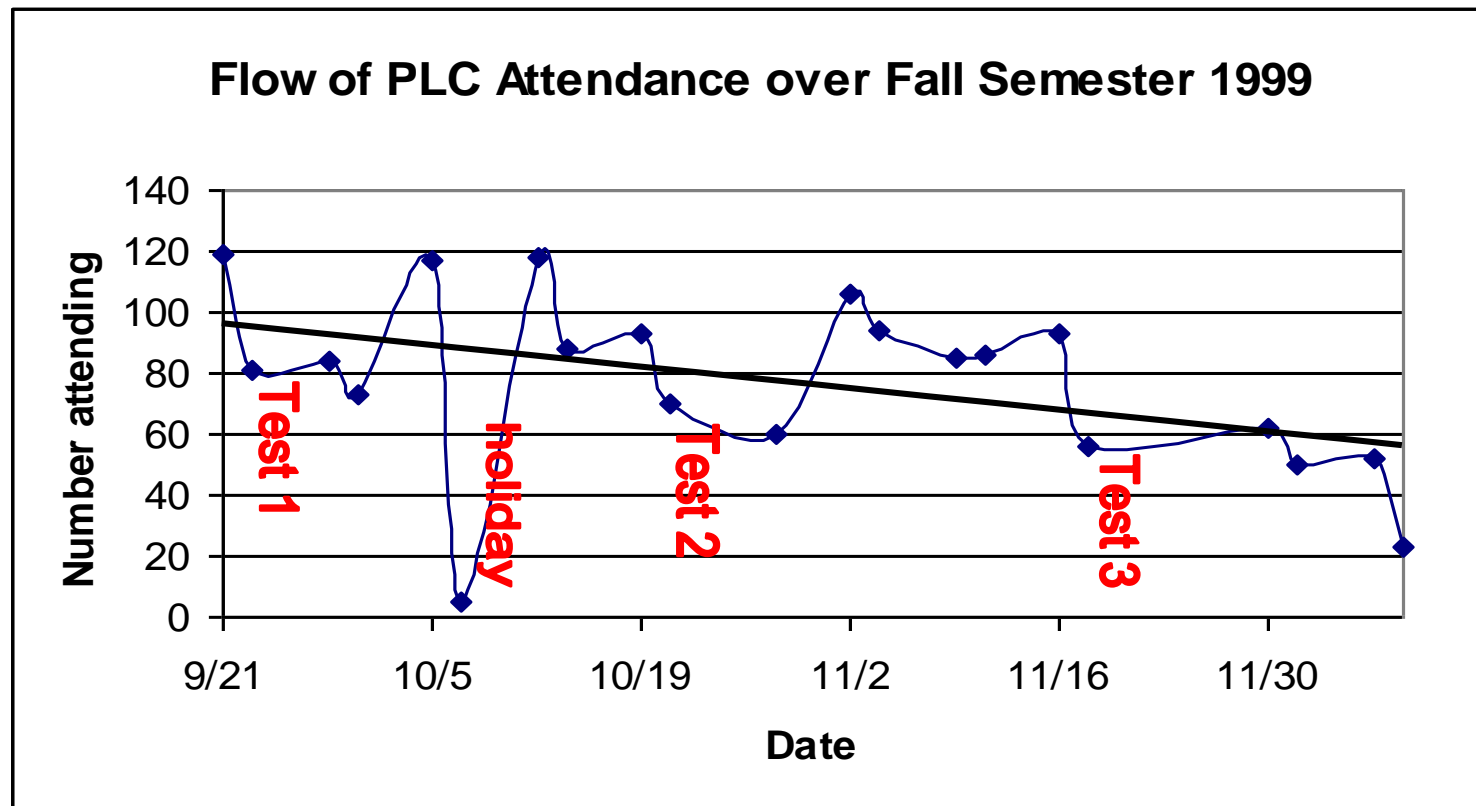
Many of life's failures are people who did not realize how close they were to success when they gave up.  
- Thomas Edison



**EE & CpE LEAD Centers**

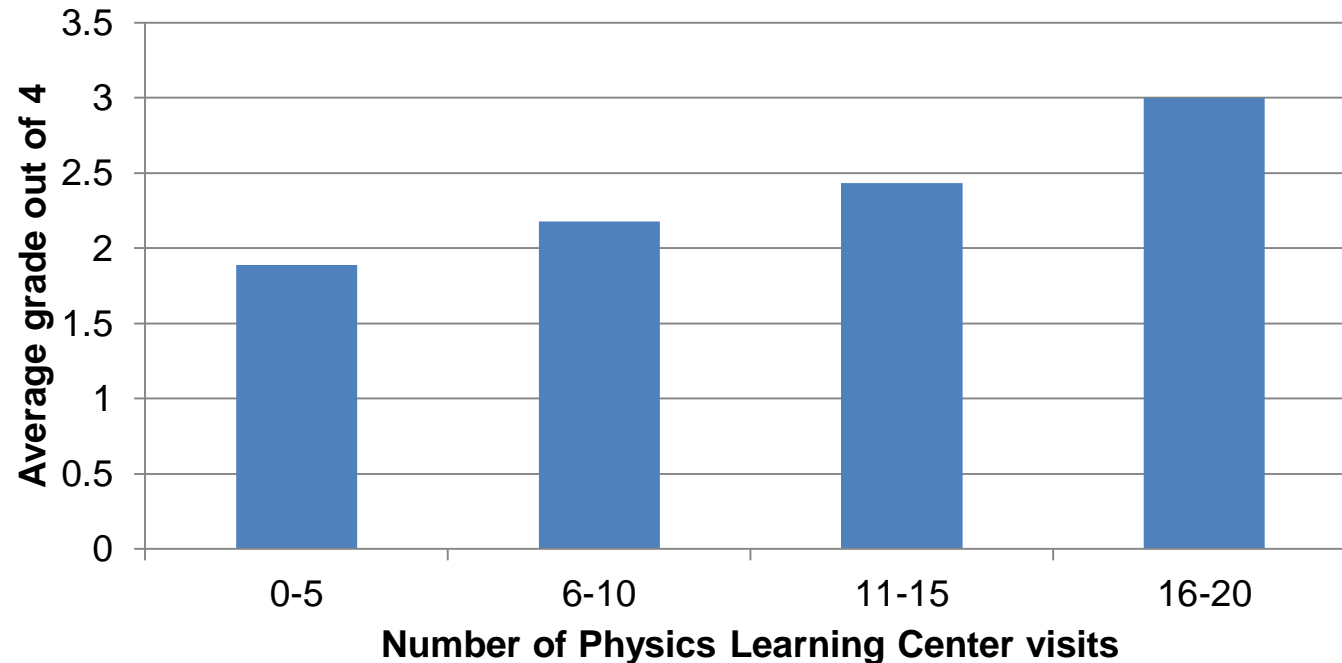
**Elec Engr 153 (Circuit Analysis II)**  
W 4 – 6pm 104 EE Bldg.  
**Elec Engr 271 (Electromagnetics)**  
M/W 6 – 7:30pm 102 EE Bldg.  
**Comp Engr 213 (Digital Systems Design)**  
Tu 4:30 – 6pm 103 EE Bldg.

~40% of Students Voluntarily Used the Physics Learning Center (Engineering Phys I)  
(note dips are just BEFORE tests)



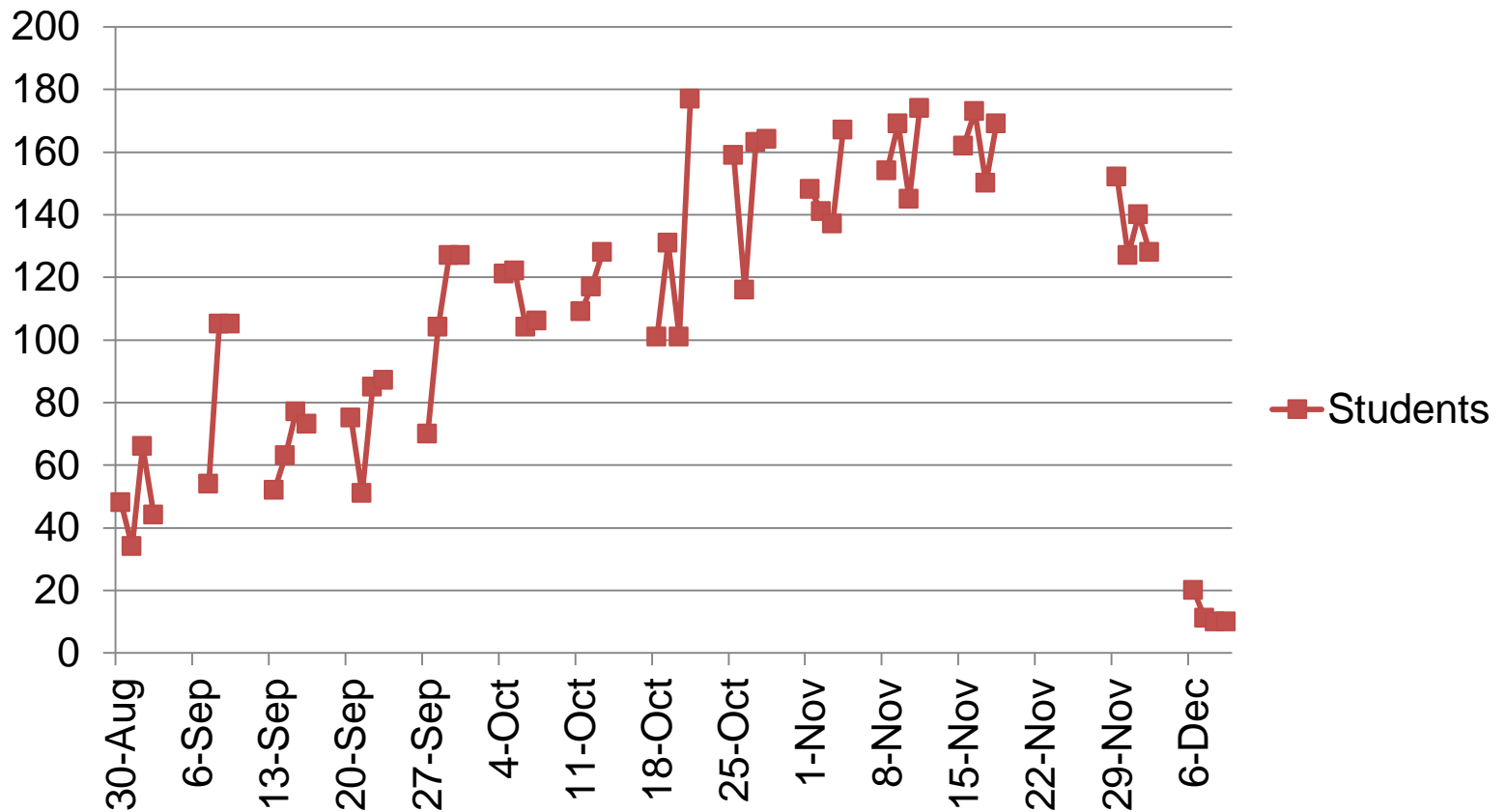
## Impact of a Learning Center (LC): Engineering Physics 1 (Fall 2010)

**Course grade as function of LC attendance**



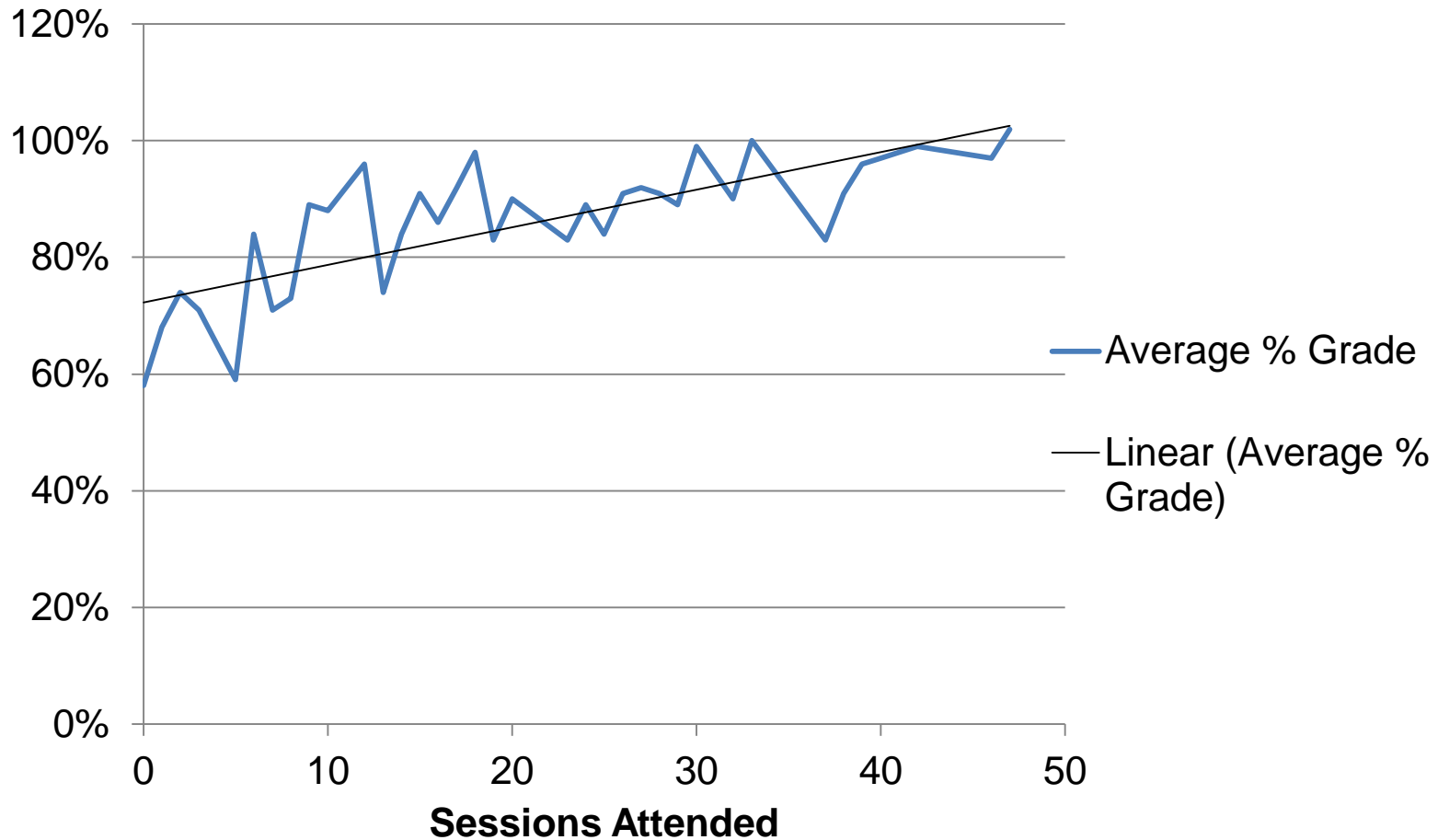
# Attendance record: S&T Chem 1 Learning Center (Fall 2010)

## Number of students attending Chem 1 Learning Center in Fall 2010

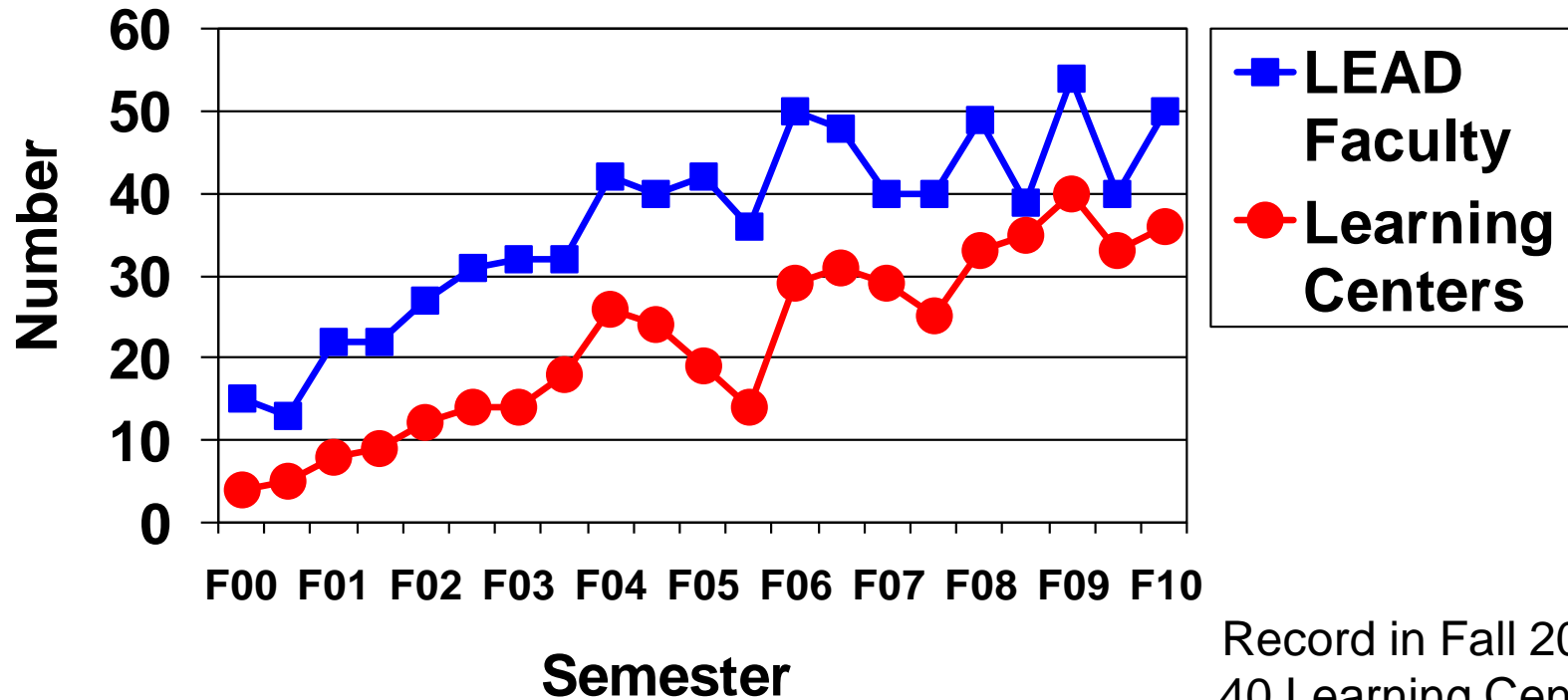


# Chemistry 1 Learning Center (F 2010) course grade vs. LC attendance

## Average % Grade



## Learning Enhancement Across Disciplines Learning Centers and Faculty Associates



Record in Fall 2009:  
40 Learning Centers  
run by 53 faculty  
in 13 departments

# 40 LEAD Learning Centers in Fall 2009

College Algebra	General Chem I	General Physics I
College Trig	General Chem II	General Physics II
Calculus I with Analyt Geo	Intro Quantum Chem	Engineering Physics I
Calculus I for Engineers	Chem E Material & Energy	Engineering Physics II
Calculus II for Engineers	Chem Engr Fluid Flow	College Physics I
Calculus III	Continuous Mass Transfer	Classical Mechanics
Discrete Math for Comp Sci	Elementary Fluid Mechanics	Intro Nuclear Engineering
Intro Physical Geography	Water Resources Engineering	Fundamental Nuc Engr
Elementary Spanish	Statics	Intro Computer Engineering
Spanish Reading & Comp	Mechanics of Materials	Digital Circuit Design
Elementary Russian	Dynamics	Circuit Analysis I
Russian Literature I	Machine Dynamics	Electromechanics
Russian Phonetics	Thermofluid Mechanics I	Communication Systems
	Automatic Control Systems	

If you would like to consider offering a LEAD Learning Center for your course and want tips for running an efficient successful one check out

<http://lead.mst.edu/documents/SettingUpLearningCenter.pdf>

or just

**please contact Ronald Bieniek, Director of LEAD**

[bieniek@mst.edu](mailto:bieniek@mst.edu)

+1 (573) 341-4786

<http://physics.mst.edu/faculty/bieniek>