

**MPLTL: Enhancing  
Access to  
Science/Math with  
Learning  
Technologies and UDI**



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**Presentation Agenda:**

- Peer-Led Team Learning (PLTL)
- Challenges for Students with Disabilities in STEM
- A Need for Change at WUSTL
- NSF Grant HRD-0726664 (“MPLTL”)
- Adaptation 1 – Peer Leader Training/Groupings
- Adaptation 2 – Academic Coaching Seminar
- Findings (Quantitative, Qualitative)
- [www.mpltl.org](http://www.mpltl.org)
- Templates (written, video)
- Next Steps

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**Peer-Led Team Learning (PLTL)**

- The PLTL model was developed by a consortium (City College of New York, New York City Technical College, St. Xavier University, University of Rochester). The initial model was called the national Workshop Chemistry Project. Today, nearly 20 campuses offer PLTL.
- PLTL supplements the lecture by introducing formalized study groups that require students to engage in active learning. PLTL groups contain 6-8 students. They are facilitated by a student (peer) leader who has close interaction with the instructor.
- PLTL aims to accomplish the following goals:
  - To teach undergraduates how to effectively use group study
  - To improve students' problem-solving skills
  - To provide facilitated help for students
  - To provide an active-learning environment for students

<http://teachingcenter.wustl.edu/peer-led-team-learning-pltl-groups>

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## Challenges to Students with Disabilities in STEM Fields

- Limited exposure to role models of engineers and scientists with visible disabilities.
- Lack of a support system for assistive technology and alternative techniques specific to a disability.
- Lack of encouragement from school personnel when considering technical fields during career exploration.
- Limited mentoring and professional development relating to a disability.

[http://www.nsf.gov/od/oa/activities/ceose/mini-sympres/Hiring\\_Practices\\_People\\_with\\_Disabilities\\_Denna\\_Lambert.pdf](http://www.nsf.gov/od/oa/activities/ceose/mini-sympres/Hiring_Practices_People_with_Disabilities_Denna_Lambert.pdf)

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## A Need for Change at WUSTL (Fall 05 – Spring 07)

- **Migration** - Migration rate out of declared STEM majors after disappointing academic performance for all WUSTL undergraduates (40%); students with disabilities (55%).
- **Academic Success** – Final Grade of “C+” or Below

Course	Class Average	Students with Disabilities (SWD's)
Chemistry 111A	40%	50%
Calculus 1	20%	25%

- **Impact of PLTL** – SWD's who participated in PLTL earned a course GPA average of 2.68 (n = 26). SWD's who took the same STEM courses but did not participate in PLTL earned a course GPA average of 2.71 (n = 73).

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**Mastery PLTL ("MPLTL")**

National Science Foundation  
Education and Human Resources (EHR)

**Research in Disabilities Education (RDE)**

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PROGRAM GUIDES LINKS

PLEASE BE ADVISED THAT THE NSF PROPOSAL & AWARD POLICES & PROCEDURES GUIDE (PAG) INCLUDES REVISIONS TO IMPLEMENT THE REVISIONS PROVISIONS OF THE AMERICAN COMPETITIVENESS AND EDUCATION ACT (Pub. L. No. 110-411, Act. No. 9, 2008) AS APPLICABLE TO THIS ACT, WHICH INCLUDES THE REVISIONS TO THE PAGES INDICATED IN THE ATTACHED TABLE. REVISIONS TO THE PAGES INDICATED IN THE ATTACHED TABLE WILL BE PROVIDED FOR EACH INDIVIDUAL. PROPOSALS THAT DO NOT COMPLY WITH THE REQUIREMENTS WILL BE CONSIDERED UNELIGIBLE. VISIT THE ACTS WEBSITE FOR FURTHER INFORMATION ABOUT THE IMPLEMENTATION OF THIS NEW REQUIREMENT.

CONTACTS

F&A Proposal Deadline Date: August 25, 2009  
Solicitation Through: Unlimited Opportunity

F&A Proposal Deadline Date: February 3, 2010  
Solicitation For: Students with Disabilities (S-D) Only  
First Wednesday in February, Annually Thereafter

F&A Proposal Deadline Date: February 18, 2010  
Solicitation: First-Year or Undergraduate  
Disadvantaged, First-Year, Annually Thereafter

F&A Proposal Deadline Date: February 17, 2010  
Topic: Mentoring in February, Annually, Thereafter  
S-D-0835116

[http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5482](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5482)

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### **Adaptation 1 – Peer Leaders/Groupings**

- **Peer Leaders**
  - 2 per group (alternating roles)
  - Trained via 1-day workshop, weekly 1-hour seminar
  - Training focused on the application of:
    - Universal Design for Instruction (UDI)  
*http://www.facultyware.uconn.edu/*
    - Learning characteristics of college students with LD/ADHD
- **Groupings**
  - Restricted to students with LD/ADHD only
    - Spring 2008 – 5 (Chem 112), 3 (Calc 3)
    - Fall 2008 – 5 (Chem 111), 3 (Calc 2), 2 (Calc 3)

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### **Adaptation 2 – Academic Coaching Seminar**

- Spring 08 (strongly encouraged)
- Fall 08 (required and taken as 1 credit P/F course)
- Develop metacognitive learning strategies for chemistry and calculus content
- Apply instructional materials on [www.mpltl.org](http://www.mpltl.org) website
- Enhance self-awareness about learning styles and college LD/ADHD issues




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### **Findings- GPA**

Course	Course Average GPA	SWD's – No MPLTL	SWD's - MPLTL
Chem 111	3.06	2.33	2.8
Chem 112	2.81	2.44	1.75
Calc 1	3.55	3.43	N/A
Calc 2	3.11	3.5	3.33
Calc 3	3.34	3.7	3.28
<b>Group Average</b>	<b>3.17</b>	<b>3.08</b>	<b>2.79</b>

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**Findings - Persistence**

	SWD's (MPLTL)	Remain in STEM	Migrate Out of STEM	Did Not Plan to Major in STEM
Persistence Rate: 71%	16	10	4	2
	SWD's (no MPLTL)	Remain in STEM	Migrate Out of STEM	Did Not Plan to Major in STEM
Persistence Rate: 61%	25	11	7	7

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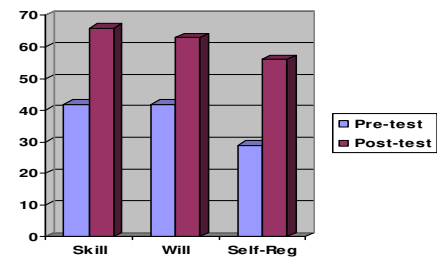
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**Findings – EF Skills**

LASSI Pre/Post Cluster Scores (n = 12)



[http://www.hhpublishing.com/\\_assessments/LASSI/index.html](http://www.hhpublishing.com/_assessments/LASSI/index.html)

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**Findings – Satisfaction Levels**

- Student Evaluations of MPLTL Sessions/Peer Leaders (n = 13)
- 5 item Likert-scale of 1 to 6 (**Overall Mean 5.3**)

"MPLTL gets me to think a little bit about math before Monday or I find myself forgetting about it and not remembering last week's work. It's also a great forum to ask questions you fundamentally don't understand."

"I worried that...a regular PLTL is going to be substantially less effective. The peer leaders [in regular PLTL] have a great understanding in their head, but that doesn't mean you can benefit from their understanding."

"The peer leaders were really good at teaching and explaining the problems at a level that is helpful. Having two people is very helpful."

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