AC 2009-341: NSF GRANTEE PRESENTATION: RESULTS OF AN INNOVATIVE APPROACH TO LEARNING VIA PEER-TO-PEER UNDERGRADUATE MENTORING IN ENGINEERING TECHNOLOGY LABORATORIES

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ABSTRACT

Undergraduate peer-to-peer mentoring using concept mapping and CLABS experiment model has been implemented at various levels at the University of Houston and the collaborating institutions Houston Community College and Texas A&M University-Corpus Christi.

COLLEGE OF TECHNOLOGY University of Houston
HCC HOUSTON COMMUNITY COLLEGE
TEXAS A&M UNIVERSITY CORPUS CHRISTI

INTRODUCTION AND MOTIVATION

There is a need for skillful technologists with creative design and application aptitude for both hardware and software. Project-based labs, developed collaboratively with the industrial board of advisors, supplementary and background information delivered with the help of peer leaders had been proposed to promote increased inquiry-based learning and overall student engagement, and provide students with a window into the industrial world.

To promote best practices, a hands-on approach was introduced to motivate and engage students in their laboratory work. The CLABS model was implemented in the development of new laboratory assignments for creative lab activities with special attention to cognitive process and diverse learning styles. Concept Maps (CMAPS) were used to engage the students with content and facilitate learning.

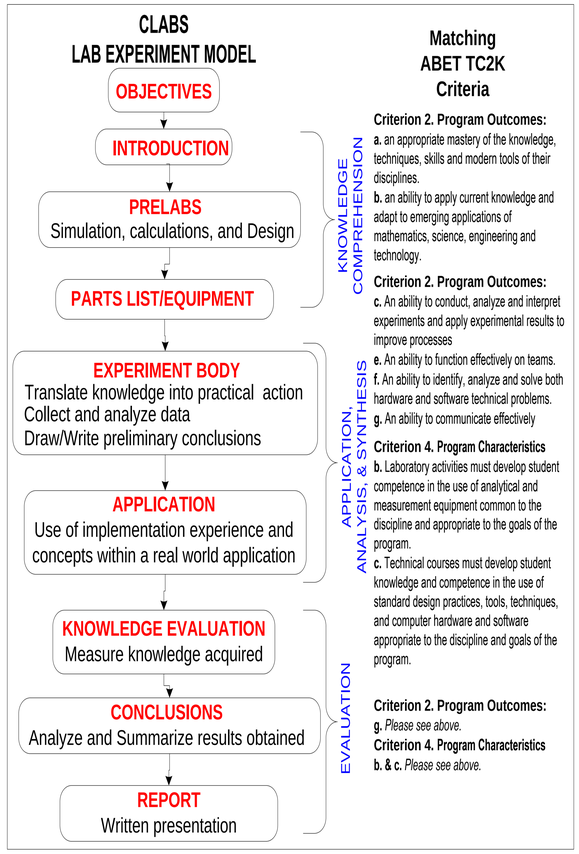
This presentation displays the CLABS experiment model; assessment activities and how they tie to project objectives; sample student grades and class average scores to demonstrate the success of the methods; the first year's findings; and future directions.

PROGRAM OBJECTIVES

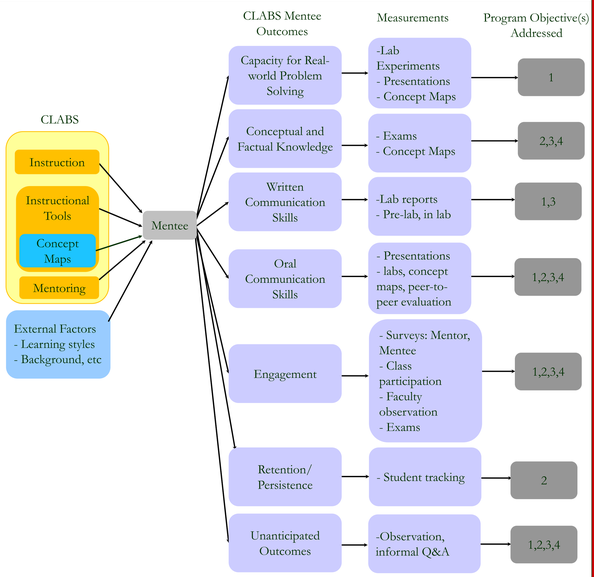
Through peer-to-peer mentoring, CMAPS and CLABS model,

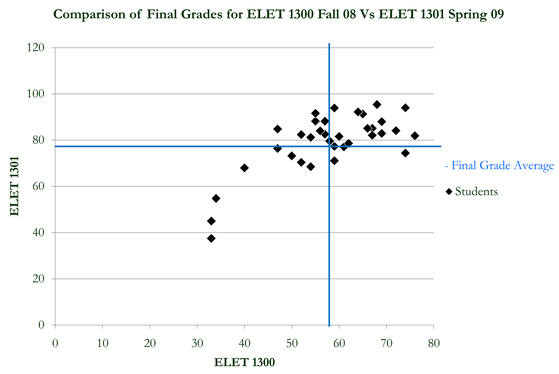
1. Increase students' capacity to engage in "real world" problem solving.
2. To better retain and engage underrepresented students.
3. Improve students' written and oral communication skills.
4. Increase students' conceptual and factual knowledge of engineering technology.

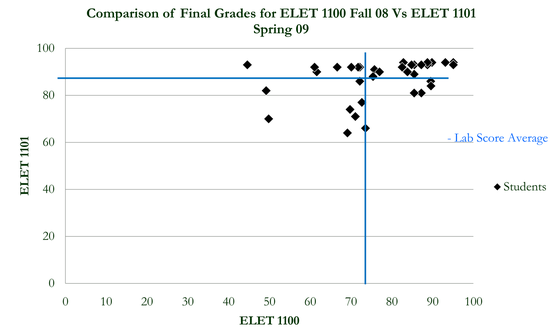
BACKGROUND

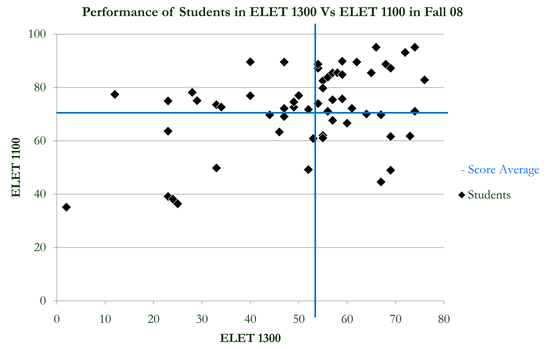


ASSESSMENT ACTIVITIES









Performance for CETT 1403 Laboratory, Fall 08 - HCC

	N*	Midterm Average	Final Average
Pilot Group	10	89.7	89.8
Traditional Group	9	86	84.5

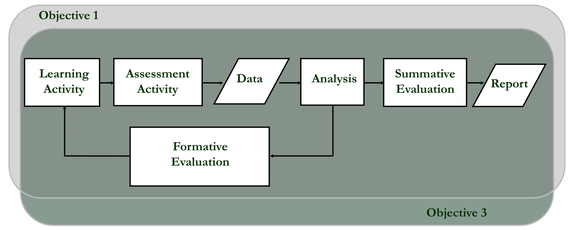
* Number of Students

Performance for CETT 1403 Laboratory, Spring 09 - HCC

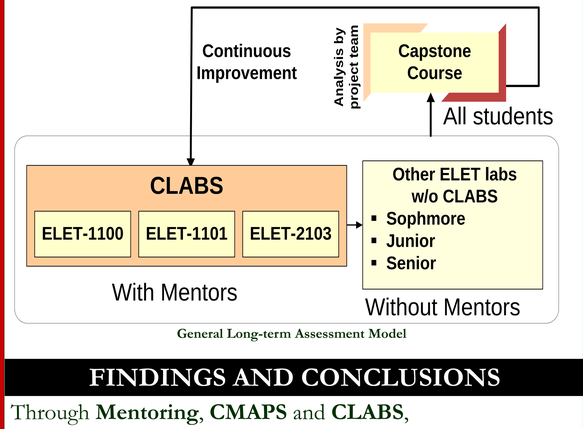
	N*	Midterm Average	Final Average
Pilot Group	10	88.3	90.8
Traditional Group	8	83.8	82.6

* Number of Students

ASSESSMENT MODEL



Assessment Process for One Program Learning Activity



General Long-term Assessment Model

FINDINGS AND CONCLUSIONS

Through **Mentoring**, **CMAPS** and **CLABS**,

- mentees became more knowledgeable about their experiments
- mentees could technically explain their solutions
- more interaction among teams was observed
- mentees demonstrated enhanced base knowledge retention
- mentees could discuss and analyze various CMAPS in the context of concepts learned
- mentees showed desire to become mentors
- combination of tutoring and mentoring increased mentees' engagement
- informal mentoring sessions increased mentees' participation

FUTURE PLANS

Increase the level and the role of a mentor in a mentee's academic life through

- Identify struggling mentees early and provide additional assistance as needed
- Involve mentors during laboratory sessions to assist the mentees in their lab activities
- Establish regular office hours for the mentors
- Upgrade the affected lab manuals to include C Maps
- Create student resource manual

ACKNOWLEDGEMENT

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National Science Foundation WHERE DISCOVERIES BEGIN