Inquiry-Based Learning & Web enhanced pedagogy A modest proposal for those of us who do more with less *Cecil Harold McManus, Ph.D.* Saint Augustine's University

Paper presented at the 8<sup>th</sup> Sloan-C International Conference on Asynchronous Learning Networks, Orlando, Florida, November 8-10. (2002)

#### Credits

This project was made possible through the generosity of the United **Negro College Fund and their Curriculum Development Grant** mechanism. This project was developed for those of us who choose to work at HBCUs for all that they mean to African Americans.

#### The Five Trends

- Decentralization
- High Touch
- Long-term view
- Multiple-options
- Opportunity Creation



# Inquiry Based Learning + Learning Management System High Touch

# Inquiry Based Learning + <u>Blackboard.Com</u> High Touch

#### What is IBL

- Pedagogy
- Art
- Science
- Profession
- Teaching
- Meta-cognitive
- Process based
- Factually driven



Choose an LMS **E-learning platform** Advanced communication system Virtual classroom **Electronic Socratic Server** Link to the world **Question** Support Web-Enhanced

Blackboard.Com? Hammer Shovel Saw Wheel Screw driver Bolt & nail It's Electric

Blackboard.Com? **Build** a house Dig a canal Cut away branches Drive across country Put things together Make them stay It's Electric

THE LMS **Builds knowledge Builds Understanding** Cut roadblocks away **Drives the imagination Fights procrastination** Put shared ideas together Helps with retention and recall It's a tool

Lev Vygotsky set the groundwork for the idea of communal learning and the use of symbolic tools---shared tool.

# Students have patterns of information integration

# College Student's have a Zone of Proximal Development too!

We must understand the learning patterns and support the development of students where they are

#### Students are novices

#### Novices see the world as abstract

#### Students become experts

## Experts have a pragmatic view

#### How does IBL work?

### It is based on five principles

# **Driving Question**

Topical Issue driven Requires investigation Requires compilation Requires hypothesis testing Requires divergent thinking



# The Scientific Approach Investigations 101

Driving question Working hypotheses Survey literature Formal hypotheses Data collection Data analysis Conclusions Report



#### Artifact Development

Paper to defend Poster to defend Grant application to defend Computer program New research model Something tangible Something real



#### Learning Communities

Shared tools Student in activity Internal collaboration External collaboration Bring others along Collective investigations Collective presentations Virtual research labs



#### **Cognitive Tools**

**Computers** Networks **DVD** Courses Student Web pages Student Web sites **Advanced SPSS-PC** CAD virtual reality



## **Idiographic Learning**

- Respect for individuals
- Non-traditional learning
- Student is active
- Teacher is a facilitator
- Mobile education



# Students are partners in the process

#### Meta-cognitive skills enhanced

#### Avoids the old transmission model

# CHANGE

# Student projects Emphasize investigative skills Focus on natural interests of students

#### Heavy on the front end

#### Extreme preps...

Builds momentum and then workfocus changes! Spinning tops keep spinning Project supported by a UNCF Curriculum development grant

# Requires students to think in an inductive manner. No assumptions allowed.

# Emphasize problems solving skills

Otterbach, R. (2000). Hypothetico-deductive thinking as a metacognitive knowledge acquisition strategy

The results indicated that coaching and a combination of scaffolding can be used to increase the problem-solving skills and HDT skills of low-hypothetico-deductive thinkers.

Because learning and working environments are becoming more inductive, individuals with low-HDT skills can improve their problem-solving skills with support

Coaching, Socratic questioning and scaffolding will increase their problem solving skills

High HDTs will increase their problem-solving skills without such support.

# Summary

Inductive environments used as instructional settings must provide support for
low-hypothetico-deductive thinkers to insure that these students can benefit from these environments.

#### IBL

Edelson, D., Gordin, D. & Pea, R. (1999). Addressing the challenges of inquiry-based learning through technology and curriculum design.

(1) student motivation (2) accessibility of investigation techniques (3) background domain content knowledge (4) student management of extended activities (5) practical constraints of the *learning context* 

The authors suggest that the implementation of technology-supported inquiry learning requires an integrated process of both technology and activity design

(1) identification of a motivational context (2) selection and sequencing of activities (3) design of investigation tools (4) creation of process supports

# Technology is used to advance thinking and reasoning, not to hinder them.



## ONE SIZE DOES NOT FIT ALL



#### GOAL IS TO FIT THE RIGHT PLATFORM TO THE RIGHT GROUP.

# Platform Analogy

P-1500	P-2500	P-3500	P-4500
Announcements Documents	All P-1500 Discussion Boards	All P-2500 Homepage	All P-3500
Assignments Gradebook	Digital Documents Active Groups	Virtual Classroom Electric Blackboard	Independent Inquiry
	Active Links	On-line Quizzes & Examinations	Student site Development
		Learning Communities	Information Development
			Knowledge Creation

#### Platforms at College

First Year	Teacher Led	Concept driven
		Facts based
Sophomore	Teacher Led	Concept driven
		Process active
Junior	Shared	Process driven
	Classroom	Data driven
Senior	Student led	Knowledge
		Creation

# Inquiry Based Learning + <u>Blackboard.Com</u> High Touch

### **Idiographic Learning**

- Individual Curriculum
- Non-traditional learners
- Active Platform
- Professor is a facilitator
- Mobile education



#### Benefits

- Problem solvers
- Experts
- Divergent Thinkers
- Critical Thinkers
- Educated students
- Better Understanding
- Higher Performance
- Graduate School Success

