Creating Technology Rich Learning Environments for the Classroom

PRESENTED BY BETSY DELL

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INCREASING STUDENT ENGAGEMENT AND RETENTION USING CLASSROOM TECHNOLOGIES:
CLASSROOM RESPONSE SYSTEMS AND MEDIATED DISCOURSE TECHNOLOGIES.
EMERALD PUBLISHING
Education problem being addressed

Learning theory basis for redesign of courses

Features desired in a technology rich learning environment

Examples from the classroom

Assessment measures
Education problem being addressed

% DFW grades

Pre - Technology Rich Interactive Learning Environment (TRiLE)
Traditional class delivery method or “Pour it in”

- 100%: MULTIPLE INSTRUCTORS
- ONE METHOD
- POOR RETENTION
- PASSIVE ROLE
- “PERPETUATING THE CYCLE”

modeled after Lila Smith (1975)(Karl A. Smith, et al., 2005b)
Theoretical Basis

Technological Pedagogical and Content Knowledge (TPACK) (Koehler, 2012)
Key pedagogical design principles for creating the technology rich learning environment.

- A learning environment that emphasizes collaboration and values peer instruction
- Sufficient amount of student invention and practice with the new content to allow successful linkage and retrieval
- Timely, anonymous, and complete formative assessment feedback for both the instructor and student
Key design principles (cont.)

- The ability to direct the learner’s attention to the critical components

- The ability to show concurrently different approaches, applications, and linkages to allow the student to make connections to the new content
Course Redesign

- Increase the use of interactive activities taking advantage of the technology
  - promote student participation
  - individual and group work
  - student-student interactions

- Increase the availability of content to the students outside of the classroom (flipping the classroom)

- Present and embed video links of real applications
Course Redesign

- Create and administer immediate feedback assessment tools
  - better manage student-learning outcomes
  - encourage students to come prepared to class

- Introduce activities that promote cooperative, collaborative and problem/project based learning
What does this class look like?
Convertible Laptops and Slates
Group Work
Immersive visual environment
SOFTWARE ENVIROMENT (DyKnow)

PNEUMATICS: AIR PREPARATION AND COMPONENTS

LEARNING OBJECTIVES
1. Understand the basic properties of air.
2. Apply perfect gas laws to understand the basic of air processing.
3. Describe briefly the purpose, construction, and operation of compressors.
   A. Positive displacement versus Dynamic compressors.
   B. A look inside into reciprocating (most common +D), screw, and vane compressors.
   C. Air capacity ratings.

SPECIAL ATTENTION TO:
- Understand that in a gas: pressure, volume, and temperature are correlated.
- Compressibility. It is the property that affect the most in designing a pneumatic system

PROBLEM / DEMONSTRATION OF THE DAY:
Air Compression/Compressors Animations...
Practice Examples and Problem 13-28E...
0610-305 Pneumatics and Hydraulics

DyKnow Test Drive
Where I will write; where you should write

Polling test
I think DyKnow may be able to help me in the class in the following ways
A) Take notes on the presentation AND have all of the professor notes
B) Be able to absorb the material rather than just copying the material
C) Use the chat feature to ask the professor to review a point
D) Prepare for tests using my electronic notes I can access from any location
E) All of the above
"Seeing" student learning progress
Assessment measures.

% DFW grades

Pre - Technology Rich Interactive Learning Environment (TRiLE)

Post - TRiLE
## Technology Rich Interactive Learning Environment (TRiLE) vs. Control Classes

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<tr>
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<th>TRiLE</th>
<th>Control</th>
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</thead>
<tbody>
<tr>
<td><strong>Mean (standard deviation)</strong></td>
<td>3.192 (0.8500)</td>
<td>2.500 (1.014)</td>
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### Grades for Low versus High GPA students in the TRiLE versus control classes

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<tbody>
<tr>
<td>Low GPA (&lt;3.0)</td>
<td>2.507 (0.8259)</td>
<td>1.904 (0.8687)</td>
</tr>
<tr>
<td>High GPA (&gt;3.0)</td>
<td>3.607 (0.5407)</td>
<td>3.263 (0.5833)</td>
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Grades for Men versus Women in the TRiLE versus control classes

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<tr>
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<tbody>
<tr>
<td>Male</td>
<td>3.160 (0.8684)</td>
<td>2.568 (0.9966)</td>
</tr>
<tr>
<td>Female</td>
<td>3.474 (0.6118)</td>
<td>2.105 (1.0485)</td>
</tr>
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Conclusion

• The TRiLE approach in the classroom helps students succeed in engineering technology classes.

• Students with a lower GPA entering the courses perceived a greater benefit from this learning environment and recommended using the technology rich lecture environment.

• The technology rich environment allows the instructor to implement an interactive and engaging learning environment.
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