Using Problem-Based Learning to Identify Culturally and Linguistically Diverse Students

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Poll: I am...
A. A teacher
B. An administrator
C. Another education professional
D. Other

Poll: I am...
A. More interested in identification
B. More interested in PBL
C. Equally interested in both

Project Insights
- Javits Grant
- 3-Year Project
- Collaboration between UNC Charlotte, Wilson County Schools, and UNC Chapel Hill
- Follow-up to Project PBLISS (high school)
Three Middle Schools in Wilson, NC

Low Income High Ability

Early Identification is BEST

But

What about the students we MISS?

What gets in the way when identification takes place in early adolescence?

Established Patterns
Deficits in Content Knowledge
Peer Culture
Negative Expectations
Teacher Perception

how do we shift
WHAT a teacher sees

CURRICULUM

and the
WAY
a teacher sees?

Employ CURRICULUM to reveal if a student will...

- Ask good questions
- Seek answers
- Learn information (quickly, easily)
- Reason well
- Demonstrate insight
- Tolerate ambiguity

Problem-Based Learning

PBL and Student Engagement

“...no sample was found in which students’ attitudes did not favor PBL to some degree.”

Vernon & Blake, 1993, p. 554

- Enjoy learning
- A more meaningful learning environment
- More nurtured
- More and better student-to-student interactions
- Greater breadth of interest in subject matter
Part 1: Curriculum Development

- Expert-Practitioner Collaboration
- Musician-Composer Collaboration
- Science and Social Studies
- NC Standard Course of Study
  - Grade 6 Social Studies: European History,
  - Grade 6 Science: Structure and Function of Living Organisms
- Adjustments for Student Skill Level

Looking for ability in someone with deficit content knowledge and whose practice in higher order thinking may be minimal

Problem-Based Learning

- Starts with a problem and questions
- Honors prior knowledge, but does not REQUIRE prior knowledge
- Welcomes participation and curiosity
- More level playing field where reasoning is crucial to performance
Poll: What is your familiarity with PBL?
A. I know a lot and have taught using PBL
B. I know a lot but don’t have hands on experience
C. I’ve been to a PBL presentation
D. I’ve heard of PBL
E. This is my first introduction to PBL

Two Sixth Grade Units
- Black Death
- Social Studies
- 1348 Italy
- Mosquito Coast
- Science
- Contemporary

Problem Scenario
It is April 1348—one of the worst plagues in recorded history. Take it for the king’s last words before he dies. With each word, he becomes more profound. He lies dying in the dark. You’re sitting next to him. You’re his last words are your last words before a plague spreads and kills everyone. You’ll be the last person to have ever heard his words. What will you hear before you die?

Merchant Jacob Altmann’s Story
When you see the merchant, your heart sinks. This is not a man who looks like he has answers. In fact, he seems to be a very nervous and frightened man. He looks around nervously, as if he’s trying to find someone who might help him. He starts talking, but he doesn’t make much sense.

The merchant tells you a story about the Black Death. He says that it started in Asia and spread to Europe. He says that people were dying in their homes and on the streets. He tells you that the plague was carried by infected fleas and that the only way to avoid it was to stay away from infected people. He says that people were so afraid that they would avoid areas that had been infected.

When the merchant dies, you hear his last words. He says that the plague is spreading and that everyone should stay away from each other. He says that people need to be careful and that they need to take precautions to avoid getting infected. He says that the plague is a dangerous and deadly disease and that people need to take it seriously.

You feel sorry for the merchant. He was brave enough to face the plague, but he didn’t have the answers. You hope that his story will help others to understand the danger of the Black Death.
The ill-structured problem creates a story that frames all learning during the unit.
Adjustments: Scaffolding

Contained body of knowledge, gathered in advance
Live presentation of information

Differentiation

PBL is not automatically gifted curriculum

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Primary Resources

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Internet Resources

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Embedded Instruction:
Lessons that give students necessary skills, tools, and perspectives

History and Geography
Spread of Disease/Animal Life Cycle

When Will the Disease Arrive?

Embedded Instruction:
Lessons that give students necessary skills, tools, and perspectives

Advanced Analysis
Adding Up Logically

**Problem Log**

**Combining Facts to Conclude Answers**

- *Problem 1*
  - Fact 1: three days
  - Fact 2: three days
  - Fact 3: three days
  - Fact 4: three days
  - Conclusion: three days

- *Problem 2*
  - Fact 1: three days
  - Fact 2: three days
  - Fact 3: three days
  - Fact 4: three days
  - Conclusion: three days

- *Problem 3*
  - Fact 1: three days
  - Fact 2: three days
  - Fact 3: three days
  - Fact 4: three days
  - Conclusion: three days

- *Problem 4*
  - Fact 1: three days
  - Fact 2: three days
  - Fact 3: three days
  - Fact 4: three days
  - Conclusion: three days

**Conclusion**

- **Conclusion of Problem 1:** three days
- **Conclusion of Problem 2:** three days
- **Conclusion of Problem 3:** three days
- **Conclusion of Problem 4:** three days
Embedded Instruction:
Lessons that give students necessary skills, tools, and perspectives

Conceptual Reasoning

Risk

Unit Generalizations
1. Vulnerability increases the potential impact of risk.
2. Factors of the environment affect the likelihood of risk.
3. Risks like disease can affect both physical and societal health.
4. People in different professions take different approaches to risk.
5. The magnitude of risk can be reduced by removing a threat or reducing vulnerability.

1. Risk is defined, in part, by the possibility of suffering harm or loss
2. Perception of risk is often different from actual risk
3. Risk vary according to the amount of control and/or information available

Risk: The likelihood of an undesirable event

Vulnerability: Being exposed to emotional or physical injury
Risk Thermometer

Key Question Sets

Culminating Activities
A Variety of Assessments
Teacher Perception

how do we shift WHAT a teacher sees

and the WAY a teacher sees?

Part 2: Teacher Preparation

Year 1: Beta Testing
  - Bright Child-Gifted Child
  - Problem-Based Learning Basics
  - Unit Specific Training
  - Fear Management

Year 2
  - Bright Child-Gifted Child
  - Problem-Based Learning Basics
  - Unit Specific Training
  - Fear Management
  - Peer Observation

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### BRIGHT CHILD vs GIFTED LEARNER

<table>
<thead>
<tr>
<th>BRIGHT CHILD</th>
<th>GIFTED LEARNER</th>
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<tbody>
<tr>
<td>Knows the answers</td>
<td>Asks the questions</td>
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<tr>
<td>Inattentive</td>
<td>Highly attentive</td>
</tr>
<tr>
<td>Not interested</td>
<td>Inattentive</td>
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<tr>
<td>Has good ideas</td>
<td>Better ideas</td>
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<tr>
<td>Works hard</td>
<td>Plays around</td>
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<tr>
<td>Answers the questions</td>
<td>Discourages distractions</td>
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<tr>
<td>Teases group</td>
<td>Beyond the group</td>
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<tr>
<td>Listens with interest</td>
<td>Shows strong feelings and opinions</td>
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<tr>
<td>Learns with ease</td>
<td>Already knows</td>
</tr>
<tr>
<td>To a maximum</td>
<td>5-10 repetitions for mastery</td>
</tr>
<tr>
<td>Understands ideas</td>
<td>Constructs abstractions</td>
</tr>
<tr>
<td>Expresses peer</td>
<td>Prefers isolation</td>
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<tr>
<td>Progress in development</td>
<td>Improves learning</td>
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<tr>
<td>Has strong ideas</td>
<td>Assumes responsibility</td>
</tr>
<tr>
<td>Incentives</td>
<td>Incentives</td>
</tr>
<tr>
<td>Has a high degree of self-confidence</td>
<td>Enjoy learning</td>
</tr>
<tr>
<td>Expresses knowledge</td>
<td>Requires information</td>
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<tr>
<td>Teachable</td>
<td>Manages information</td>
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<tr>
<td>In school</td>
<td>Learns independently</td>
</tr>
<tr>
<td>In art</td>
<td>In science</td>
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<tr>
<td>Aesthetics</td>
<td>Aesthetics</td>
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</tbody>
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Janice Szabo, 1989
Part 3: Implementation

The ENTIRE sixth grade Team Teaching Black Schedule Gifted Resource Teacher as Support

After Two and A Half Weeks of Instruction...

- Teachers Identified a Set of Students who were NOT identified as gifted, but performed surprisingly well

  A total of 37 students

How well did they choose?

Six assignments gathered

- 2 Social Studies from Black Death
- 2 Science from Mosquito Coast
- 2 PBL one from each unit
All Work Samples Represented Higher Order Thinking

Assignments Coded and Sent To Evaluation Team In Chapel Hill

A Five Point Scoring Rubric
Benchmark 3 Point Response

I would keep away from the topoi that has the Black Death. Also I, would wear the crow costumes that protects your whole body. I would eat right and keep healthy so it would be harder for my family and I to catch the Black Death. I would do those things so my family and I wouldn't be in danger of catching the Black Death.

Benchmark 5 Point Response

I am so tired from that meeting, and need something to eat and drink. I stayed at meeting for 4 hours.
First, need something to keep that plague out. We need to always keep our house clear and don't need to leave any food on the floor or outside, because if we don't rats are going to come
Second we don't need to bring anything from the outside/somewhere else, because it could catch the plague and could give it to us, and we could die.
Third we need to go tell our neighbors so they can also keep our side and their house and outside clean. We need to all come together and put all of our scraps of food in one spot and we can kill all of the rats in one spot in one time.
If we do all of these things we probably can stop the plague from coming to our town.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Traditionally Identified (n=20)</th>
<th>Advanced Academic Potential (n=37)</th>
<th>General Education (n=217)</th>
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</thead>
<tbody>
<tr>
<td>Male</td>
<td>% 45</td>
<td>% 35</td>
<td>% 53</td>
</tr>
<tr>
<td>Female</td>
<td>% 55</td>
<td>% 65</td>
<td>% 115</td>
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<tr>
<td>Minority</td>
<td>% 45</td>
<td>% 82</td>
<td>% 99</td>
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<tr>
<td>Free Lunch</td>
<td>% 7</td>
<td>% 3</td>
<td>% 76</td>
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<tr>
<td>Table 5. Proportion of male, minority and free lunch qualified students in Traditionally Identified, Advanced Academic Potential, and General Education Groups</td>
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*p < .01
What Happened Next?
Part 3, Year 3

Resource Room
Autonomous Learner Model
Self-Directed Research
Self-Efficacy
The Take-Aways

- First level identification CAN be organic to classroom practice...
- ...if classroom practice is BEST practice
- ...if teachers know what gifted ‘looks like’
- We miss MANY students who think differently
- PBL restructures the concept of ‘classroom smart’
- PBL works for ALL students, but to different degrees
- Teachers need significant support with first ventures in PBL (or other unfamiliar) methods to ensure fidelity
- High quality curriculum is the result of musician-composer collaboration

Questions?

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