STEMulating High School Culture Through Leadership and Coaching!

Winter Instructional Leadership Conference

February 25 – 26, 2020

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Dr. Valencia Bradshaw

Dr. Ava Debro

- **Banneker High School** Assistant Principal| Director 3DE Business & STEM Magnet.
- **Years in Education-** 20 years**.**
- **Prior to BHS:** School Improvement Specialist, Instructional Coach, Lead Teacher, Department Chair & Science Instructor.
- **Interesting Fact:** Dislike chocolate but I love…

Dr. Valencia Bradshaw

- **Banneker High School** STEM Director| 3DE Business & STEM Magnet.
- **Years in Education:** 14 years.
- **Prior to BHS:** WBL Advisor, CTAE Department Chair & Marketing Instructor.
- **Interesting Fact:** In 2003 while working as a banking vice president, I volunteered with JA at a local high school. Shortly afterwards, I made a mid-life career change from banking to education and now work with JA through 3DE schools!

Session Norms

- Place electronics on silence/vibrate.
- Remain engaged in learning.
- Respectfully share opinions.
- Ask questions for clarification to avoid making assumptions.

Session Outcomes

- School instructional leaders will learn how to create collaborative environments.
- School instructional leaders will learn how to create effective high school interdisciplinary PLCs.
- School instructional leaders will learn how to use the design thinking model in classrooms.

Interdisciplinary High School PLCs

Outcomes: 5+ Years

Student Impact

- 55% ↑ Student Attendance
- 40% ↑ Graduation
- Student Leaders (SGA, CTSOs, Sports and Other Clubs and Organizations)

Instructor Impact

- 95% Teacher Retention
- Schoolwide Leaders (DC, Instructional Coaches, Testing Coordinators, WFD Coordinators, Lead PD, etc.)

Barriers to High School Interdisciplinary PLCs

Turn & talk:

What are some barriers to effectively implementing interdisciplinary PLCs in high schools?

Our Barriers:

- Scheduling conflicts (PLCs)
- Instructors with multiple preps
- Uncomfortable
- Scope and sequence alignment
- Instructors unable to find connections

Why Interdisciplinary Teaching & Learning?

- Expose and introduce concepts from multiple disciplinary perspectives.
- Reiteration of concepts.
- Boost learning outcomes and enthusiasm.
- Improve instruction and expand teaching toolkit.
- Foster collaboration and cross-curricular connections.

Barriers to High School Interdisciplinary PLCs

Turn & talk:

What are some solutions to overcoming barriers to effectively implementing interdisciplinary PLCs in high schools?

Our Barriers:

- Scheduling conflicts (PLCs)
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Moving past challenges

Challenges	What did we do!
Course scope and sequence	Instructor flexibility
Scheduling conflicts	PLCs held during school day or afterschool
No connections, Instructors w/ multiple preps	Make connections where appropriate
Uncomfortable	Create consistent environment of collaboration

Whole Team PLC

Purpose: Assist Instructors Develop More Interdisciplinary Activities			
	Activity	**Ownership**	**Activity**
1x Each Month	**Team Updates**	➢ **Lead Teacher** ➢ **AP** ➢ **STEM Coordinator**	**Departmental Updates**
	➢ **Examine Case Study Challenge** **Or** ➢ **Plan/ Identify STEM Interdisciplinary Project**	**Grade Level Teams (Core + CTAE)**	➢ **Unpack the case study challenge (examine the problem)** ➢ **Core teachers discuss possible ways to support case challenge and standards alignment** **<u>Deliverables</u>** ➢ **Semi-detailed plan of how to integrate case challenge in class**

Weekly Team PLC

Purpose: Help Students Develop More Interdisciplinary Solutions
Support & Feedback From STEM Coordinator, Lead Teacher & AP

	Activity	Ownership	Activity
PLC #1	Research-Based Instructional Strategy	➢ Teachers ➢ STEM Coordinator	Rotation- Each instructor demonstrates a research-based instructional strategy.
	Departmental Rotations	Teachers	<u>Guided Questions</u> 1. How are you going to ensure that students understand the CASE Challenge problem in your class? 2. How are you going to assist students in researching and examining the problem in your class? 3. How will your discipline, content, or skills be spotlighted in the final presentation? 4. How will you assist in enhancing the top four team's presentations? 5. How do I take what we observed, learned or experienced during the site visit back into my classroom?
	Data Talks/ Student Work/ SMF Focus Lesson/ Remediation + Recovery	➢ Lead Teacher ➢ AP	➢ Recovery + Remediation- 1x each month ➢ Data Talks- based on Assessment Calendar- 1x each month

Weekly Team PLC

Weekly PLC Structure Purpose: To provide time to plan lessons			
	Activity	**Ownership**	**Activity**
PLC #2	**Protected Planning Time**	**Instructors**	➢ **Lesson Planning** ➢ **Update Gradebook** ➢ **Parent Contact**

Sample Project – Case Study

TOPIC: What target market should Georgia Power focus on to increase sales within its online marketplace? Theme- Making Effective Decision Competency- Critical & Analytical Thinking	
CTAE	Activity- Students completed a SWOT Analysis (Strengths, weaknesses, opportunities & threats to online marketing). Students created a decision tree to represent the outcomes of each possible outcome.
SOCIAL STUDIES & SCIENCE	Activity- Students utilized a decision tree in Social Studies & Science.
MATH	Activity- Students interpreted a graph using independent and dependent variables related to online marketing trends.
ELA	Activity- Students cited sources for research.

Sample Project – 9th Grade Team

TOPIC: SHOULD GOVERNMENT SUBSIDIZE GMOS?	
SOCIAL STUDIES (World Geography)	Activity: Students will read three articles (informative, pro and con) and will write a constructive response based on their reading.
SCIENCE (Physical Science)	Activity: Students will identify the molecular differences in GMOs and natural foods.
CTAE (Financial Literacy)	Activity: Students will compare and contrast GMOs and organic foods in order to evaluate/ analyze the economic impact of these agricultural practices in the US.
MATH (Algebra I)	Activity: Students will analyze and interpret GMO data to prove significance.
ELA (9th Lit)	Activity: Argumentative essay. Students will build upon their analysis of the articles examined in social studies and write a 6-paragraph argumentative essay supporting their position. Students are required to address and rebut the counterclaim.

Our Interdisciplinary PLC Model...

1. Common planning time.
2. Identify resources- technology, rubrics, etc.
3. Create checkpoints & timeline for completion.
4. Case study or project that will pique student interest

    *Case Studies- Launched in business classes. Core instructors connect instruction to case study themes allowing students to apply their learning.

    *STEM Interdisciplinary Projects!

STEM Education Continuum

Multi- → Inter- → Transdisciplinary

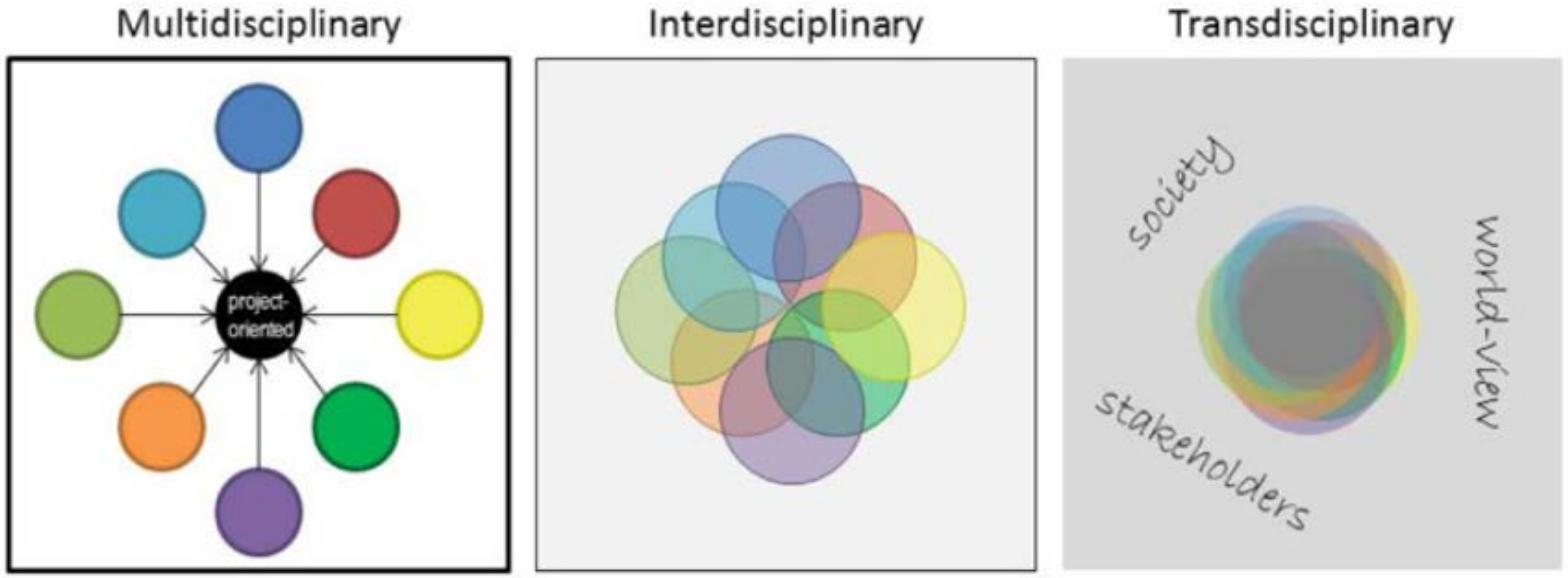


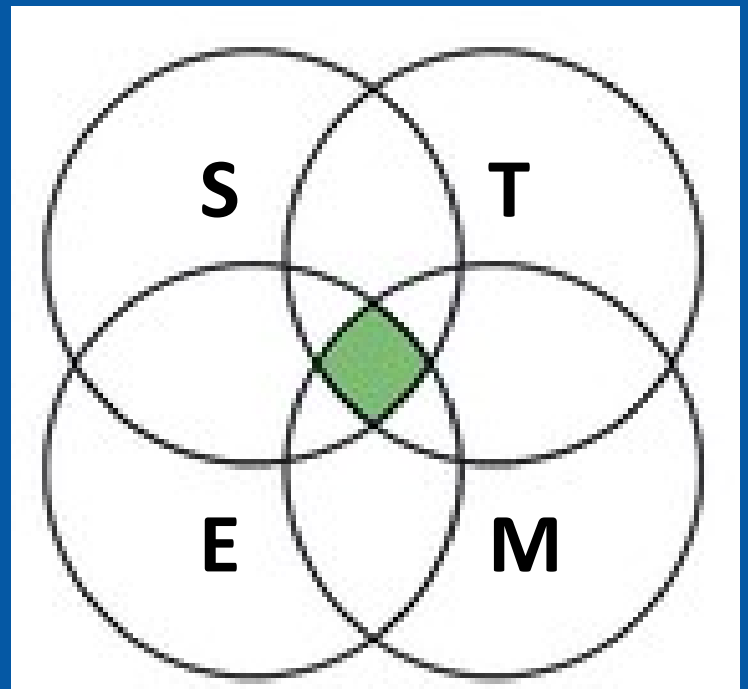
Table talk to come to a consensus.

Select the scenario that best depicts a transdisciplinary learning environment based on the “STEM integration model” handout.

Transdisciplinary STEM Education

"Transcends" content specific learning

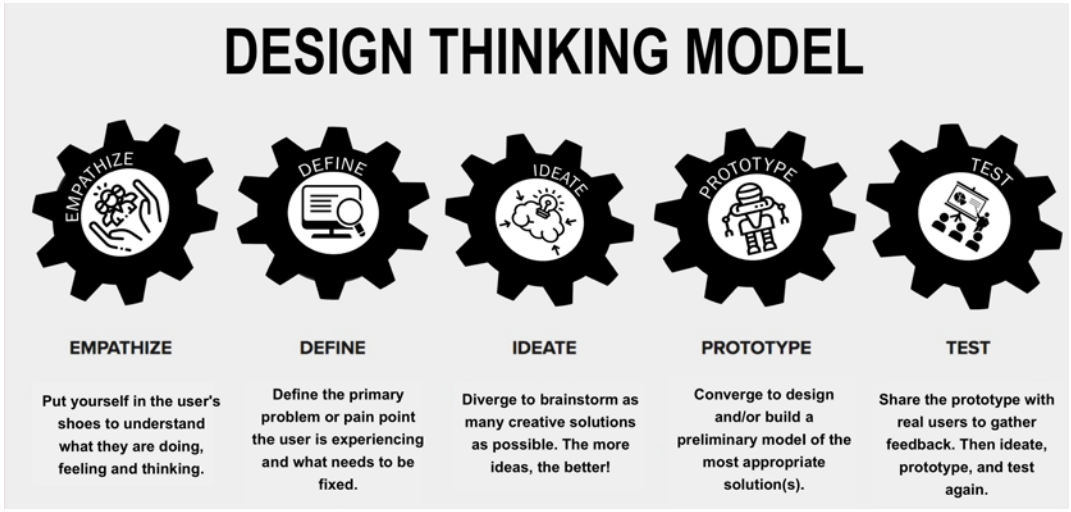
- **CAN** be taught through Project-Based Learning
- **CAN** be Problem-Based Learning (Case Studies)
- **CAN** include multiple curriculum connected through interdisciplinary instruction



- **NOT** thematic teaching
- **NOT** just teaching robotics or engineering
- **NOT** a CTAE class
- **NOT** forcing content together
- **DOES NOT** require a large budget

Georgia Department of Education

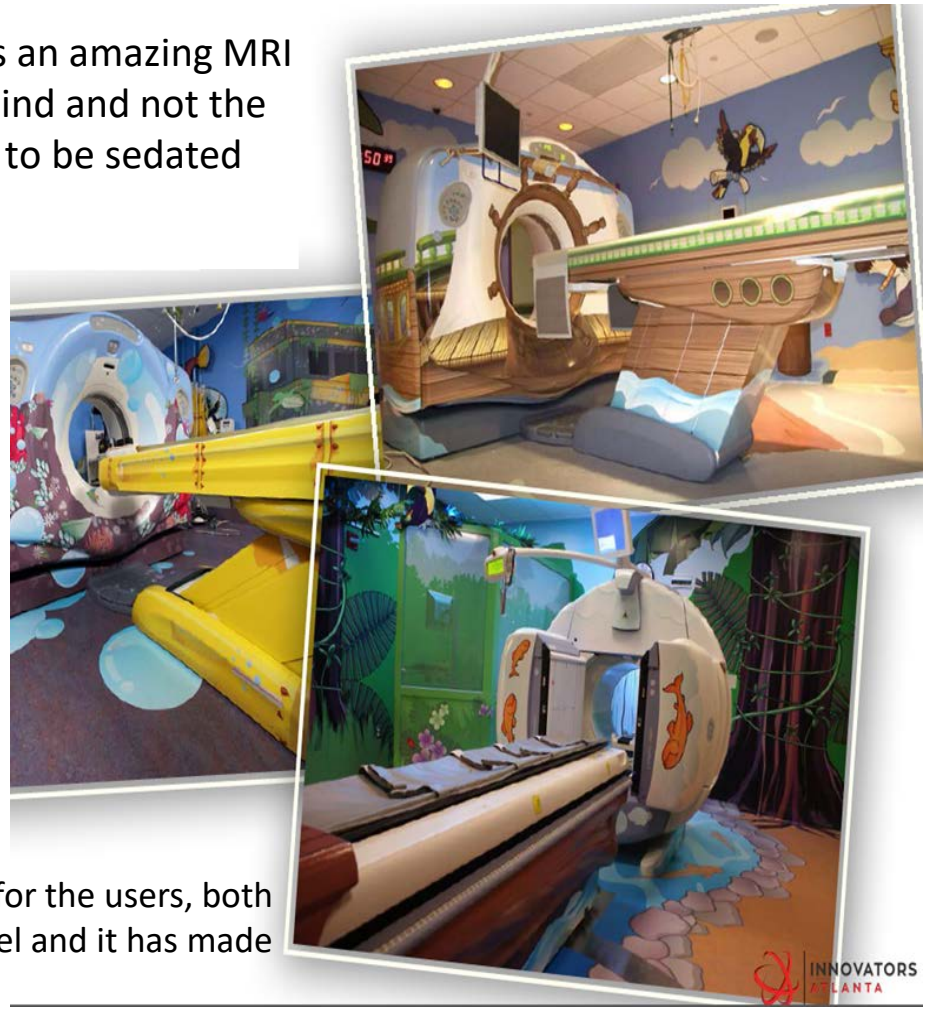
We Teach STEM Through Design Thinking



- Engages all students – not just the math and science students
- Helps students become more INNOVATIVE in their problem-solving activities

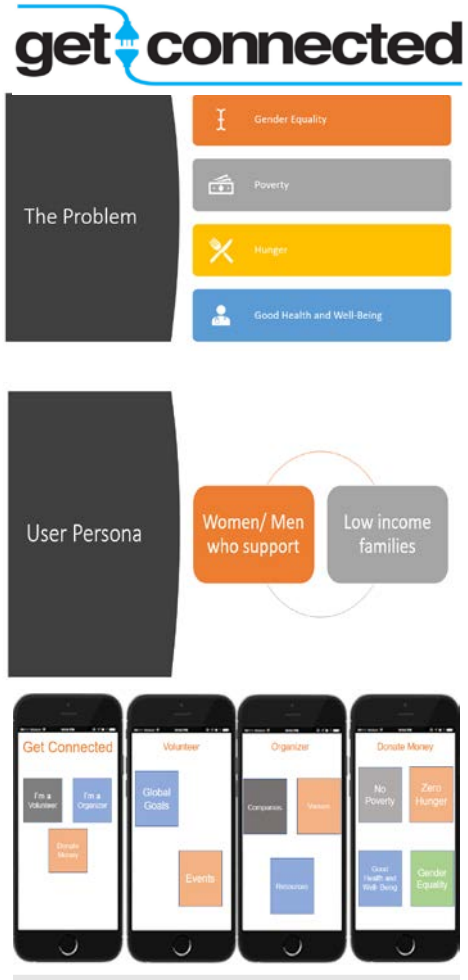
Design Thinking in Action

Doug Dietz designed what he thought was an amazing MRI machine. He designed it with himself in mind and not the users. It scared kids and they were having to be sedated at an alarming rate.



After using Design Thinking and gaining empathy for the users, both the kids and the hospitals, he redesigned his model and it has made tremendous gains for the users.

Design Thinking in Action at BHS
(Artificial Intelligence For Good Transdisciplinary STEM Project)



Are you ready to be STEMulated?

Take the STEM Self-Assessment to see where your school or district falls on the STEM readiness continuum.

Session Feedback

Thank you for attending our session. Please take a moment to provide your feedback.

https://tinyurl.com/2020ILC

Share your conference highlights now!

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