

Integrating Engineering Design and Thinking Skills into PreK-5 grade interdisciplinary education

August 5th, 2010

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'Do not go where the path may lead; go instead where there is no path and leave a trail'. Ralph Waldo Emerson



Agenda for the next 2 days

Mon	Tues	Wed	Thurs	Fri
<i>Teachers as students</i> <ul style="list-style-type: none">• Intro to Engineering• <u>The 3 Little Pigs</u>	<i>Teachers as learners</i> <ul style="list-style-type: none">• Continuation of <u>The 3 Little Pigs</u>• Reflection• MA Frameworks (Science/Engineering)• Connecting Math & Science: <u>Charlotte's Web</u>	<i>Teachers as learners</i> <ul style="list-style-type: none">• Developing thinking skills: <u>Owl Moon</u>• Measuring Success	<i>Teachers as teachers</i> <ul style="list-style-type: none">• 6 Hats Exercise• Development of lesson plans• Discussion of logistics• Create sketch models	<i>Teachers as teachers</i> <ul style="list-style-type: none">• Review/reflection• Presentations• Other activities using Design Thinking• Planning• Celebration/reflection



Agenda

- Book choices
- Using “6 Hats” to foster dialogue
- Development of lesson plans
 - Create your lesson plan
 - Run through the steps → design sketches
- Logistics/ Organizing your students and project to be successful

Book Characteristics?

- What kinds of books make good choices for finding design challenges?
- Consider values, finding problems, building models, level of interest to students, etc.

The background of the slide features a desk with a brick wall behind it. On the left, there is a desk lamp with a glass shade. In the center, a ruler is placed horizontally. On the right, a red and white pen lies diagonally. The overall scene is brightly lit, suggesting a workspace or study area.







Book Characteristics?

- Richness of character development
- Level of goals/ problems the characters have
- Ease of connection to science and math.
- Societal problems

6 Hats - Ed deBono

•Use the 6 Hats strategy to select a book for writing your team's lesson plan

•Extension: Discuss how you might use the 6 Hats in your classrooms

	White hat thinking identifies the facts, figures and information.
	Yellow hat thinking focuses on the positive aspects – the advantages, benefits and savings.
	Blue hat thinking focuses on reflection, metacognition (thinking about the thinking that is required), and the need to understand the big picture.
	Black hat thinking examines the problems and issues of caution.
	Green hat thinking requires creativeness, imagination and lateral thinking. It focuses on exploration, proposals and suggestions.
	Red hat thinking looks at a topic from the point of view of emotions and feelings, hunches and intuitions.



Team Activity ... dialogue

Will the charter school movement help public education?

Develop a position paper with the following categories:

- What we know, What don't we know and what do we need.
- How should they be connected to the public school system for learning?
- What are the benefits and cautions
- What our emotions tell us
- What possibilities could come of it

Take 25 minutes to prepare, 5 minutes to present.



Team Activity ... 6 Hats

- Share how you used the 6 Hats strategy and your ideas for adapting it to your classrooms

The background of the slide is a photograph of a desk. In the top left corner, there is a silver desk lamp with a perforated shade. The desk surface is covered with a white sheet of paper that has faint, light blue architectural or technical drawings on it. A ruler is visible on the right side of the desk, and a red and white pen lies horizontally at the bottom right. The text "Brainstorm: Elements of a Lesson Plan" is centered on the page in a large, bold, black font.

Brainstorm: Elements of a Lesson Plan

Design a sequence of Lessons for your story

- Teams work on lesson plans, including finding design challenges, possible solutions, curricular constraints, requirements, solutions, sketches
- Process:
 - Start with your learning objectives & methods of assessment
 - Create a unit plan before creating individual lessons
 - Go through the steps



Logistics/ Organizing your students and project to be successful

- Graphic: “Creating an Interdisciplinary Based Learning Environment...” - Review
- How would/do you set your students up to work successfully in teams?
- How would you introduce the design process?...How many steps, which ones, etc.
- Discuss in teams & then share with whole class

A desk lamp with a blue shade is positioned in the top left corner. The background features a brick wall at the top and a desk with papers and a red pen. A purple banner at the top contains the title. The main content is on a light orange background.

Intrinsic motivation ... Judith Dodge

Teach students to work cooperatively with others.

Give students a voice in classroom decisions.

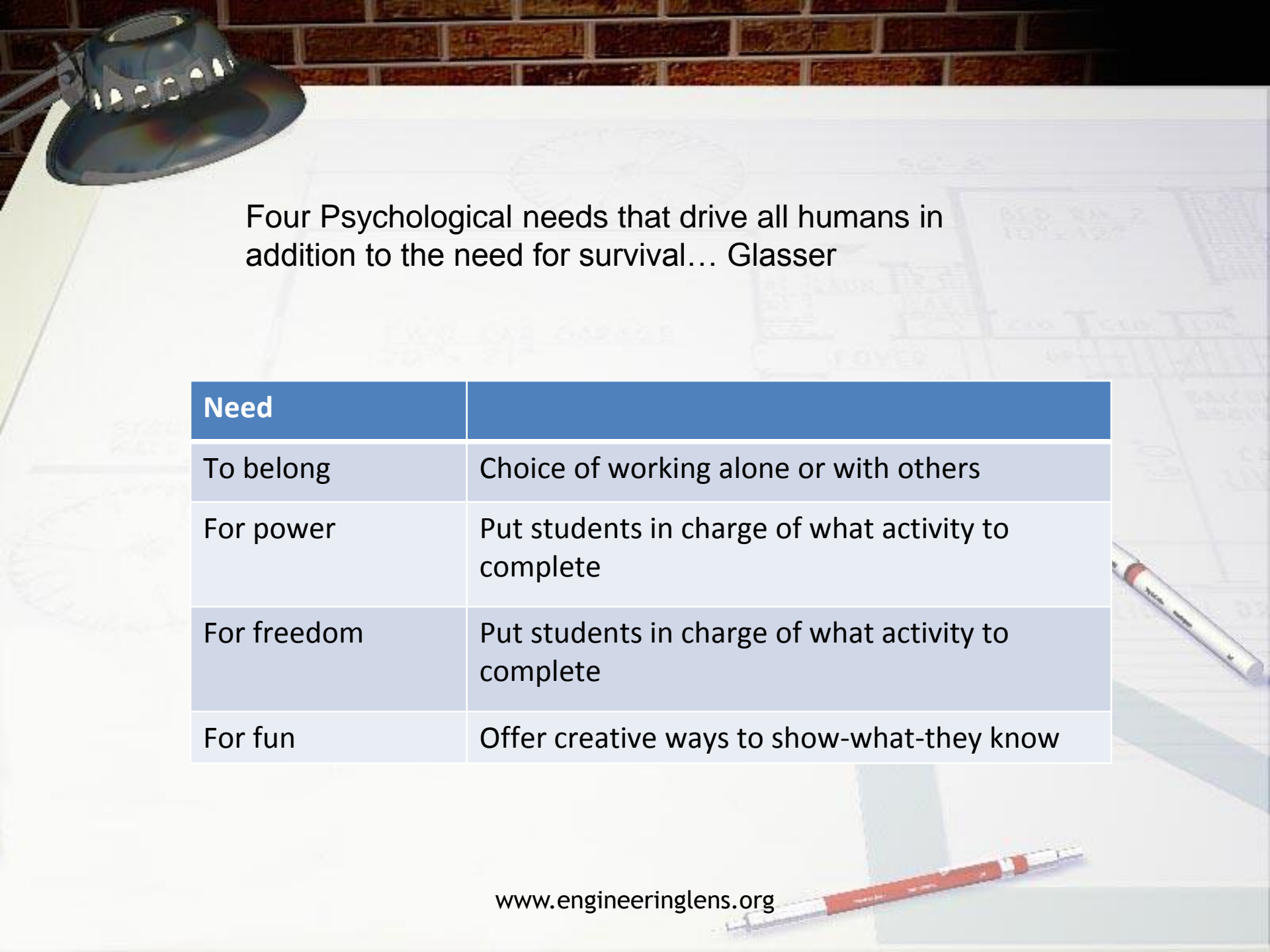
Provide opportunities for students personal growth

Teach to a variety of learning styles

Provide students with choices

Use a variety of instructional strategies

Offer fun activities that inspire creativity and reduce stress



Four Psychological needs that drive all humans in addition to the need for survival... Glasser

Need	
To belong	Choice of working alone or with others
For power	Put students in charge of what activity to complete
For freedom	Put students in charge of what activity to complete
For fun	Offer creative ways to show-what-they know

**End
Thank you**

