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Critical Thinking in Global Challenges

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- What is Critical thinking, and why is it important?
- ‘Credibility and Relevance’: Understanding where information comes from and the nature of evidence
- ‘Assessing arguments’

Critical Thinking

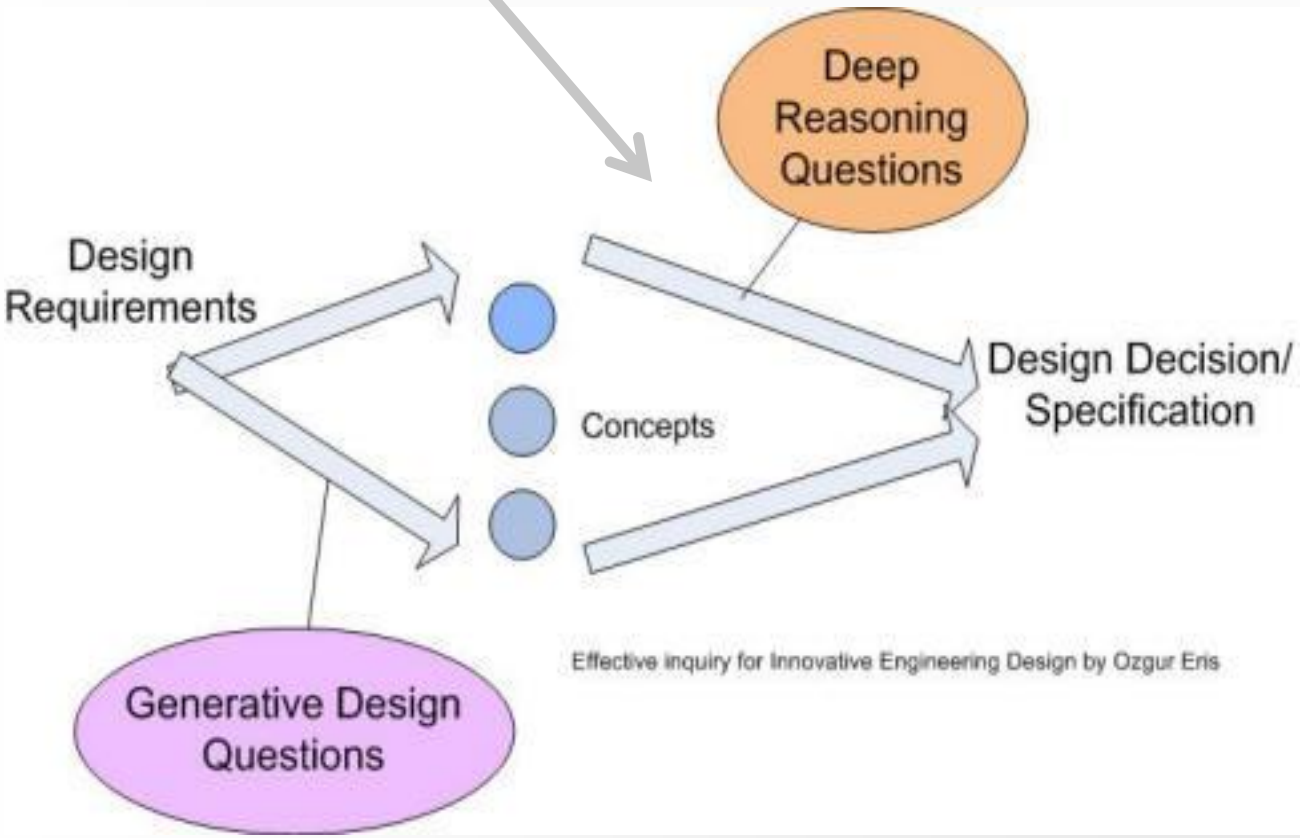
Convergent Thinking …tending to move toward one point or to approach each other : CONVERGING <*convergent* lines>

Lesson Plan: Provide a statement and ask the teams to determine if its true and the reason why.

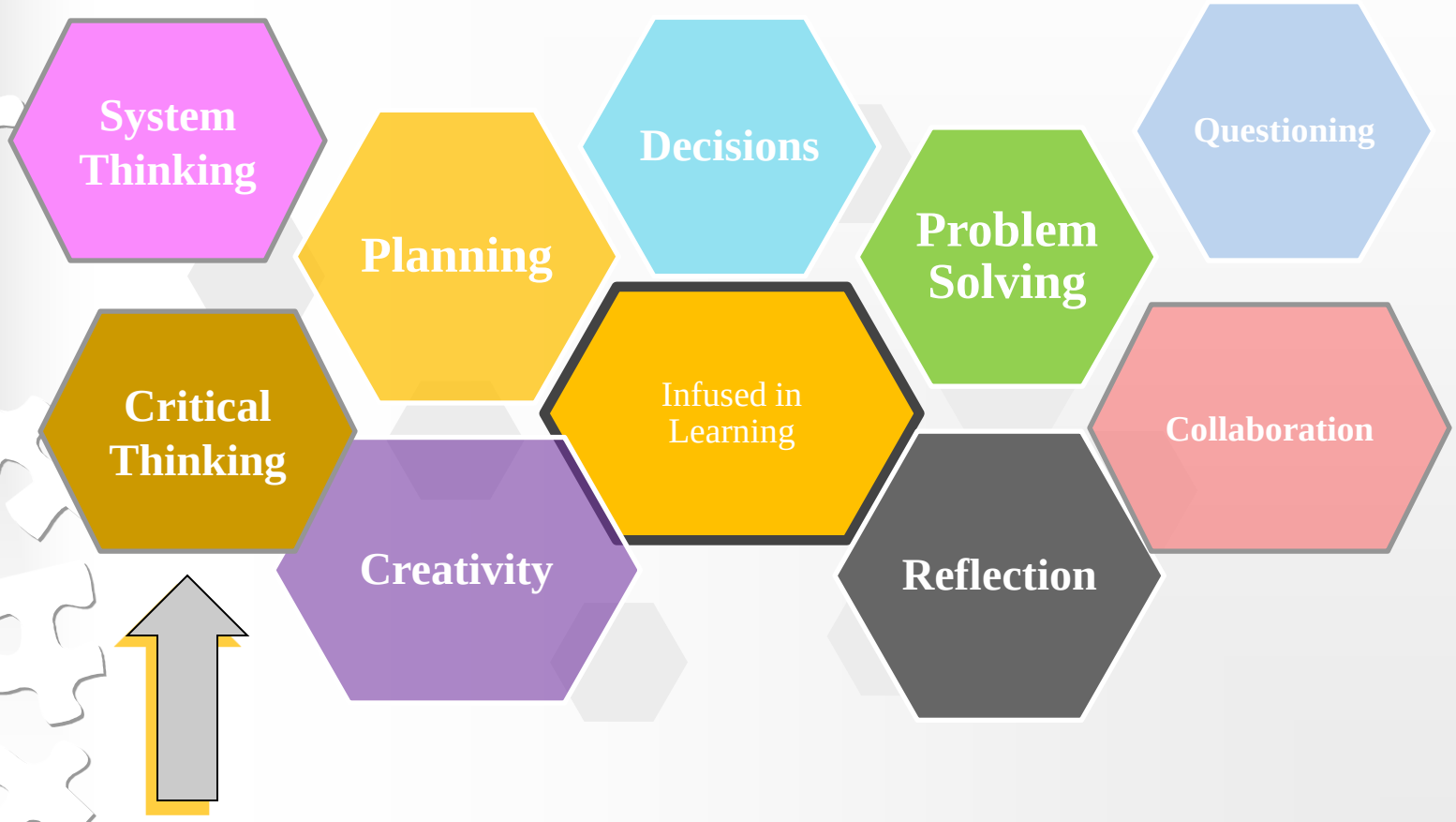
- Asks appropriate clarifying questions
- Judges well the quality of an argument, including its reasons, assumptions, evidence, and their degree of support for the conclusion
- Formulates plausible hypotheses
- Defines terms in a way appropriate for the context
- Draws conclusions when warranted – but with caution

Critical Thinking

- **Analyzing the past**
- **What evidence?**
- **What is the author's purpose?**
- **Convergent thinking**
- **Skepticism is a virtue**



Learning Modules of Thinking Skills



Bloom's Taxonomy
Higher Order thinking

Elements
Creating Generating new ideas, products, or ways of viewing things
Evaluating Justifying a decision or course of action
Analysing Breaking information into parts to explore understandings and relationships
Applying Using information in another familiar situation
Understanding Explaining ideas or concepts
Remembering Recalling information

Critical Thinking

Follow-up to the exercise:

Hindsight Questions

Hindsight Questions are used to help young people learn from experience. We want them to learn from their own experience and, perhaps more importantly, we want them to learn from the experiences of others.

Insight Questions

Insight questions are designed to help students **seek for a deeper level of understanding** by looking beyond the obvious to consider things that are more obscure and less well understood without further investigation or thought.

Foresight Questions

Foresight Questions are used to help young people **learn how to anticipate** the probable or likely consequences of their choice

Critical Thinking

* **Analyzing the past**
* **What evidence?**
* **What is the author's purpose?**
* **Convergent thinking**
* **Skepticism is a virtue**

In Critical Thinking we rely on Questions and Reflections to achieve our understanding and convergence.

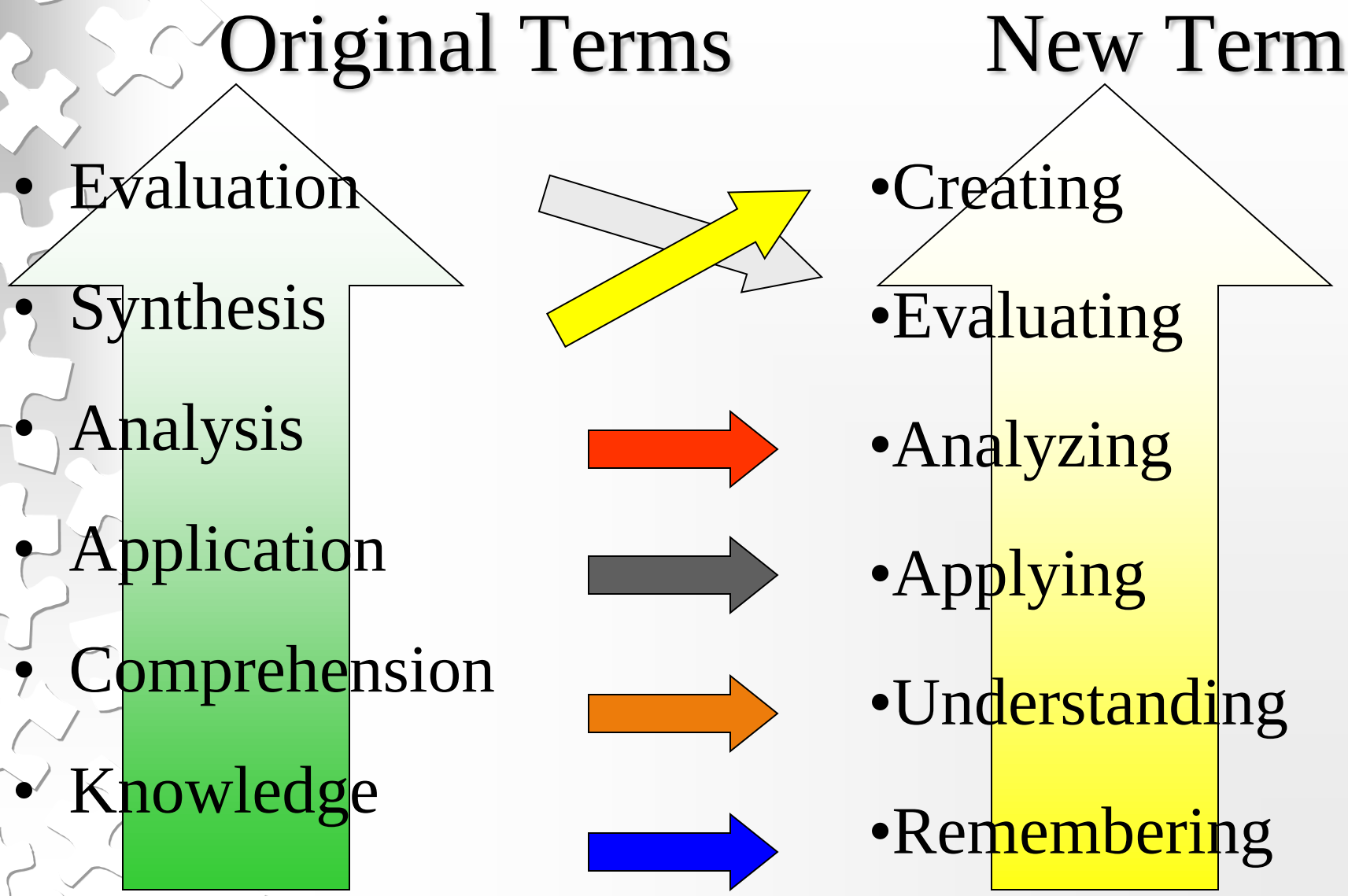
Meta-cognitive reflection

* What do I want to understand?
* What have I learned?
* What do I still need to learn?
* Provide feedback for reflection
* Regulate ones behavior

Questions … **Engaging the student**

* Logical Sequential
* Open ended
* Listening is the first step in good questioning
* Provocative
* Engage
* Encourage higher order thinking

Blooms Taxonomy



(Based on Pohl, 2000, ***Learning to Think, Thinking to Learn, p. 8***)

Bloom Questions

Elements	Verbs	Questions
Creating Generating new ideas, products, or ways of viewing things	**Designing, constructing, planning, producing, inventing.**	Compose an engineering song, skit, and poem or rap to convey the problem in a new form.
Evaluating Justifying a decision or course of action	**Checking, hypothesising, critiquing, experimenting, judging**	Assess whether or not you took the correct approach.
Analysing Breaking information into parts to explore understandings and relationships	**Comparing, organising, deconstructing, interrogating, finding**	Differentiate between how your approached the problem and how you would react in different approaches.
Applying Using information in another familiar situation	**Implementing, carrying out, using, executing**	Construct a theory as to why this was a good approach.
Understanding Explaining ideas or concepts	**Interpreting, summarising, paraphrasing, classifying, explaining**	Summarize what the problemis about.
Remembering Recalling information	**Recognising, listing, describing, retrieving, naming, finding**	Describe how you took place.

Connections between engineering, writing and reading

Engineering Design Process	Writing Process	Reading Strategies
Identify Problem	Set purpose for writing	Set purposes for reading
Research	Research: read target book, learn about key concepts, and ask questions	Introduce concepts and information needed for comprehension
Brainstorm	Brainstorm	Ask guiding questions; activate background knowledge
Choose and plan	Choose a topic, plan, organize ideas	
Create	Draft	Read and monitor understanding
Test	Get response to text (peer, teacher, target audience)	Clarify understanding as needed, evaluate text for veracity or completeness
Redesign	Revise	Re-read for understanding or read another book for additional perspective/ information. Evaluate whether an established purpose was met.
Share	Share/Publish	Discussion, poster or various writing assignments

Kathleen Spencer; Tufts, 2011

Web Sites

http://www.criticalthinking.org//