

The Necessity of Stimulating An Emotional Response in Logical Engineering Lectures

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Type of Strategy: in-class active learning

Learning Outcomes

- [1] To facilitate critical thinking through a focused active learning exercise
- [2] To engender an emotional response (positive or negative) to a logical lesson

Overview

Relatively simple, hands-on demonstrations impact the learning of students in the classroom that typically passively absorb information (not very successfully in many cases). The demonstrations are even more effective if one makes a statement of fact in a way that grabs a student's attention or sounds outrageously wrong to most of the class. (ie – it 'dings' their intuition)

Step-by-Step Instructions

In introducing a fundamental concept, find a fact that is not intuitively obvious, or better yet one that goes against intuition. Google is an excellent resource for this.

Examples that I have used in class:

- **“There is no such thing as a toxic chemical”**
- **“There is no such thing as bad radiation”**
- **“The human body is not directly temperature sensitive”**

The claims sounds outrageous and wrong. Everyone KNOWS that there are toxic chemicals out there in our food! (after all, I see posts on Facebook DAILY that this is so!)

Everyone KNOWS that you can die from radiation exposure! (and I don't even need Facebook to tell me that!)

Everyone KNOWS that you can tell when it is hot or cold!, the reasoning will go.



(logic). (and yes, weaponizing facebook memes in the fight for student attention is a good way to do it!)

Course Information

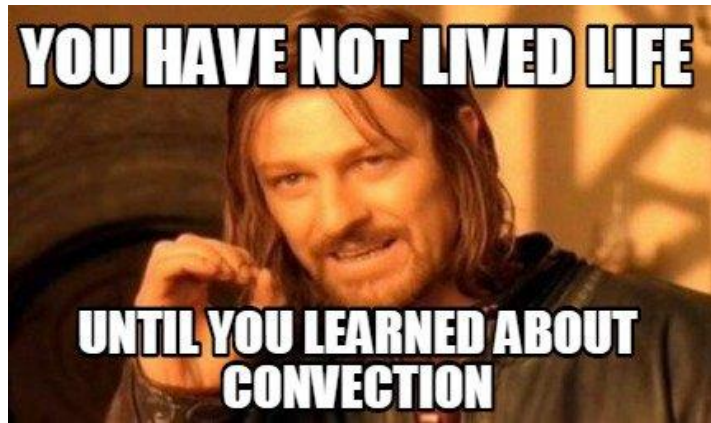
EGR 2500: Introduction to Thermal Engineering. (but the strategy can be employed in any course that touches on these topics)

An introductory course on energy, the conversion of one form of energy to another, and the transport of energy from one place to another. Concepts of heat transfer (conduction, convection, thermal radiation) are also covered.

Ease of Application to Other

Courses [

EASY MODERATE depending on the subject matter and extent of demonstration



Additional Comments

After doing these demonstrations over many years, I have had students years beyond their graduation reminisce about how they remember some of the demonstrations we did in class, and how the key nugget of those lessons stuck with them long-term.

Caution: these should be short, low-cost but high-concept. If K-12 schoolchildren can learn something from these demos, then they are great for the college classroom.

Resources Google, bouncing ideas around with colleagues. The strategy works, can be combined with storytelling and other learning strategies, and should not take much time away from a normal lecture. Much time, however, is spent on finding counterintuitive facts, and it also takes time in learning how best to seed these in the classroom (when, context, etc)