Applying Universal Design Practices in Economics Courses

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Manju Banerjee, Ph.D.
Vice President of Educational Research and Innovation
Landmark College

Case Study

- Rose is a freshman in her second semester. Her first semester at the college was stressful; but this is a new semester and she wants to get it right this time.
- She has signed up to take *Econ 101 – Microeconomics*. She is anxious about this course which is fast paced and involves *class lectures*, *readings*, *videos*, *group* and *individual activities*, *pop quizzes*, *mid-term, finals* and a *term project*.
- Rose was diagnosed as having SLD in reading and math, and ADHD in 9th grade. Her cognitive profile is average to high average. She has been approved for extra-time on tests and a note-taker. She wants to study "harder" this time and use her accommodations well.

Question: Do you think the economics course will go well for Rose?

Traditional Accommodations Are Not Enough

- Accommodations are anchored in the “deficit model” mindset
- Accommodations are retro-fits to the design of the instructional space
- Many Executive Function (EF) difficulties such as time management, prioritizing, task activation, motivation are not adequately addressed by accommodations
- Accommodations do not address stigma and shame

Economics Courses

- **Many college economics courses**:
  - require math/calculus and statistics as prerequisites
  - are a blend of quantitative and qualitative reasoning
  - require significant reading demands
  - involve simulations of real world phenomenon
  - are often a degree requirement course, with large undergraduate class size

So Lets Talk About Design

What is so cool about this building?

Source of Picture – CAST.org

Universal Design/Universal Design for Learning

- UDL is about designing the learning environment to be inclusive
- Anticipating learner diversity and therefore differences in approaches to learning
- Presenting information in different formats and modalities (**Multiple Means of Representation**)
- Creating options for engagement (**Multiple Means of Engagement**)
- Allowing for alternatives in assessment **(Multiple Means of Expression)**

Source: www.cast.org

UDL provides a blueprint for creating instructional goals, materials, methods, and assessment; BUT UDL is more …..

UDL Principles are Grounded in 3 Neural Networks

Recognition Network

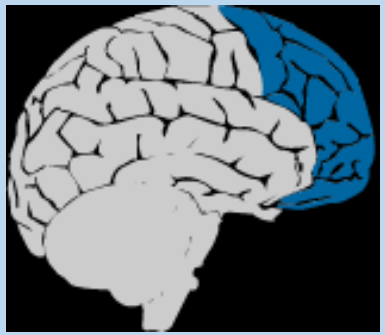
"What" of learning

How we gather facts and categorize what we see, hear, and read.

Strategic Network

"How" of learning

How we organize and express our ideas. Writing an essay or solving a math problem are strategic tasks.



Affective Network

"Why" of learning

How learners get engaged and stay motivated. How they are challenged, excited, or interested.

CAST - http://www.udlcenter.org/aboutudl/whatisudl

UDL Principles are Grounded in 3 Neural Networks

Recognition Network	Strategic Network	Affective Network
"What" of learning	**"How" of learning**	**"Why" of learning**
How we gather facts and categorize what we see, hear, and read.	How we organize and express our ideas. Writing an essay or solving a math problem are strategic tasks.	How learners get engaged and stay motivated. How they are challenged, excited, or interested.
WORKING MEMORY	**EXECUTIVE FUNCTION**	**MOTIVATION**

CAST - http://www.udlcenter.org/aboutudl/whatisudl

Leveraging Pattern Recognition

- **Activating prior knowledge**

What strategies do you use to activate prior knowledge?

- Preview; Brainstorm; KWL; Others?

- **Recommendations for design**

- Activate relevant prior knowledge
- Minimize irrelevant prior knowledge
- Compensate for missing prior knowledge

Leveraging Pattern Recognition (cont.)

- Building in opportunities:
  - Trial-and-Error until patterns emerge (safe space to fail)
  - Reflective time; partner dialogs
- Multi-media options
  - YouTube videos
  - Audio with close captioning
  - Digital flash cards
- Explicit instruction around metacognitive awareness

Prior Knowledge and Metacognitive Awareness

- **Our brains innately seek to recognize patterns and make meaning; and are constantly seeking to correct errors.**
- **Highly attuned to be alert to anomalies/differences/novel**

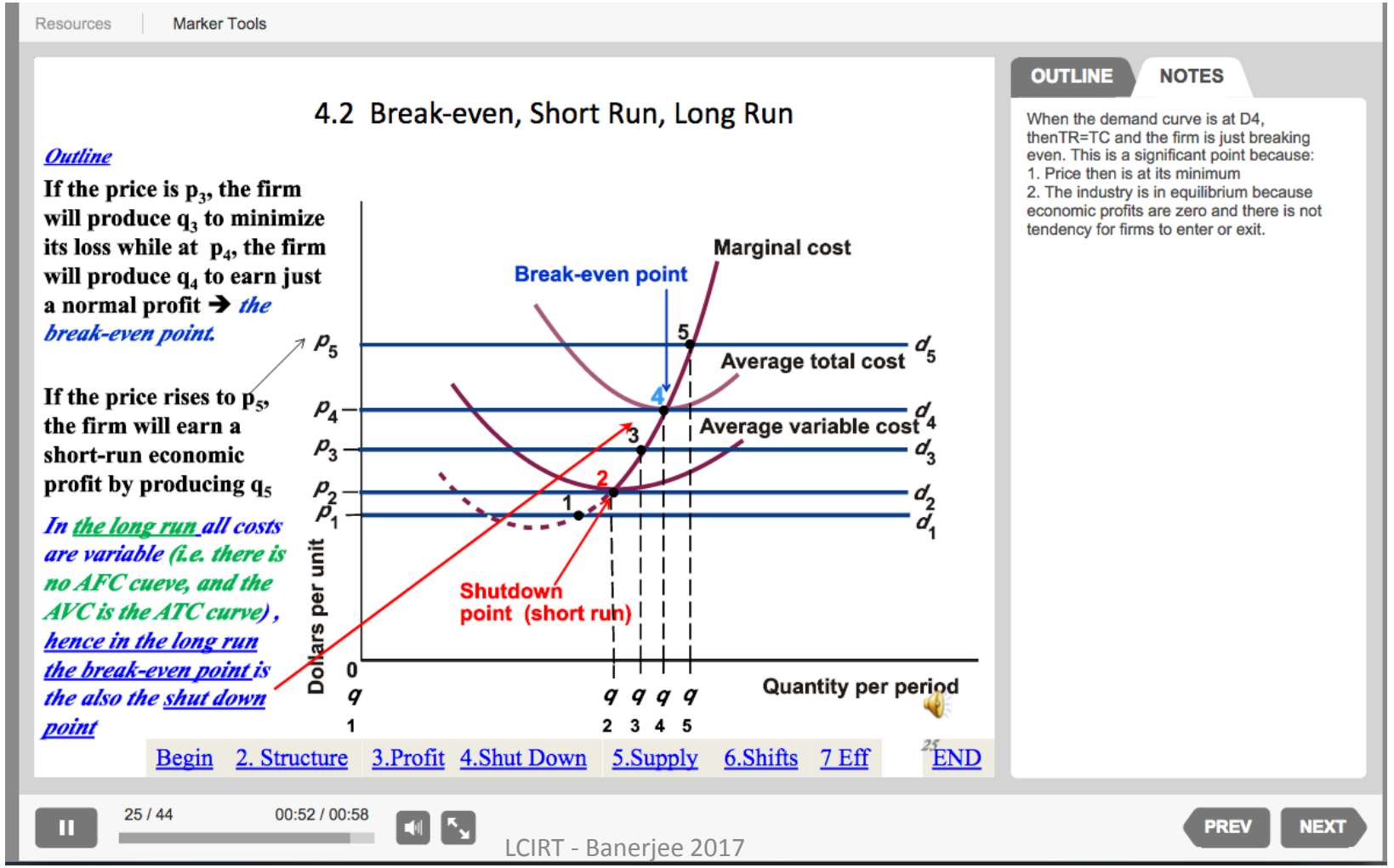
Example:

"When the **price elasticity of demand** for a good is relatively elastic ($-1 < E_d < 0$), the percentage change in quantity demanded is smaller than that in **price**. Hence, when the **price** is raised, the total revenue increases, and vice versa."

Pattern Recognition - Videos

Audio with cc, animated, play on mobile devices

Source: Oskar Harmon, Ph.D. (2015)

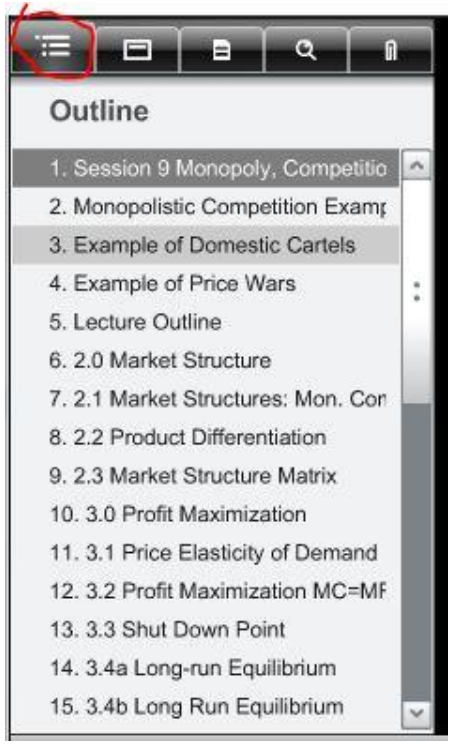


Making Content Searchable

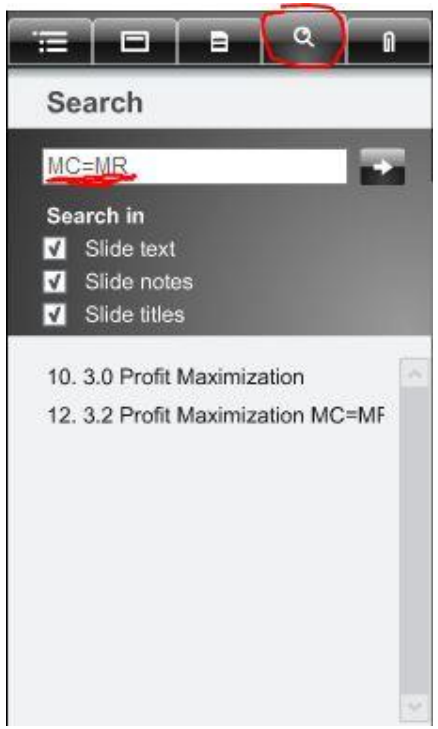
Source: Oskar Harmon, Ph.D. (2015)

Thumbnails

Outline



Search



Strategic Network (HOW)

- Strategic network is involved in planning, execution and monitoring of our action

- Strategic network is what allows us to make executive decisions (highest level) and engage in self-directed action towards a self-imposed goal

- Strategic network is critically dependent on **cognitive load and cognitive capacity**

Simulation – Cognitive Processing

Try to solve the following problems

Problem 1

3a + 23 = 2a – 7

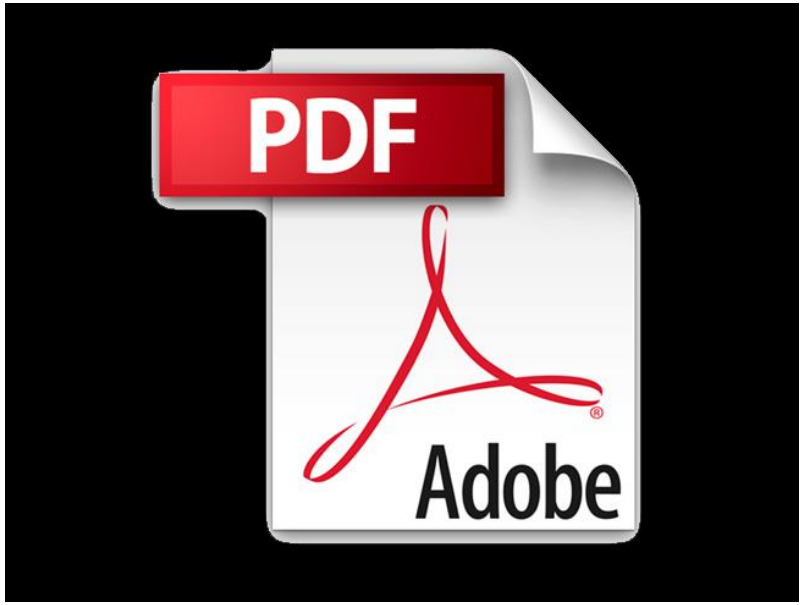
Problem 2 (solve in roman numerals)

IVa – XIX = IIa + VII

(Provided by Dr. Dahlstrom-Hakki)

Embedding Scaffolding Strategies in Text

Demo – PDF with embedded audio and text



Reducing Cognitive Load

- Ask your students to map their cognitive load challenges in each quadrant.

Then ask: **What can you outsource/offload/use technology for, within each quadrant to reduce cognitive load?**

Note-taking

Academic

Long-Term/ Big Picture

Advising

Interpersonal Social

Personal

Building social capital with peers

Academic Coaching

Classroom Pedagogies at Landmark College

1. Advance organizers – *activating interest and prior knowledge; reviews*
2. Activators – *forming a personal connection to the lesson or topic*
3. Clear directions – *communicating expectations and task requirements*
4. Connectors – *explicit connection between prior and new content*
5. Multisensory techniques – ***visual,*** *auditory, kinesthetic*
6. Strategizers – *toolbox of strategies; metacognitive strategies*
7. Summarizers – incremental and frequent reviews
8. Routines – building effective study habits
9. Flexible assessment – multiple means of assessment; varying rubrics

Source: LCIRT

Affective Network – WHY

- Helps us attach emotion and motivational significance
- Set priorities and engage in certain behaviors
- Developmentally, the affective network develops sooner than the strategic network

Implications for UDL?

Emotional Regulation

- Ability to inhibit inappropriate behavior related to strong negative or positive emotion (response suppression)
- Self-soothe/down regulate physiological arousal
- Refocus attention from emotionally provocative events
- Organize emotions for coordinated action to reach a goal

(Barkley, 2011)

Koole, S. L. et al. (2010). *Handbook of Self-Regulation (2nd Ed.) (pp. 22-40)*. New York: Guilford.

Gross, J. J. & John, O. P. (2003). *Journal of Personality and Social Psychology, 85*, 348-362.

Games, Gamification and More ….

- We know how important it is for little children to play games.
- When learning happens accidentally and/or as a by-product of exploring, it is fun!
- When learning is framed within a **game or a quest**, its intrinsic reward keeps us engaged.
- Today's formal education interrupts the premise of learning through games; **formal education is efficient, but often not engaging**.
- It may be time to reinvent learning and think about **gamification and game-based learning (GBL)** in education.

https://www.youtube.com/watch?v=c0xa98cy-Rw

Gamification vs. Game-Based Learning

- **Gamification** refers to the adoption of game-like principles outside of a gaming context. When as an instructor you assign reward **Points**, use a **Leaderboard**, or distribute **Badges**, you are gamifying your class. *Focus: motivate and engage*

  Example: Rezzly - http://rezzly.com/ (content creation platform for quests)
  http://rezzly.com/case-studies/

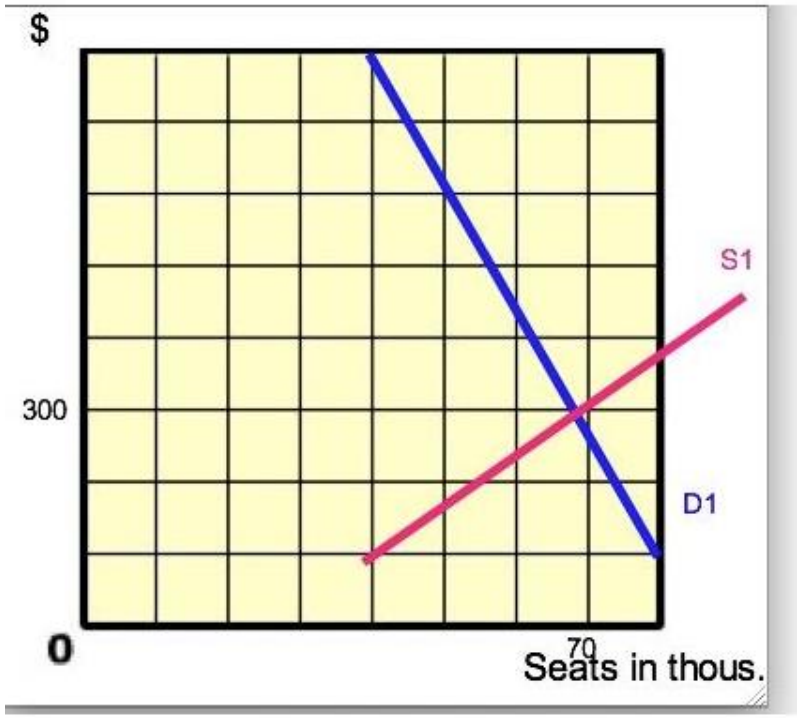
- **Game-Based Learning**, on the other hand, means including games, often "video games" in your instruction.

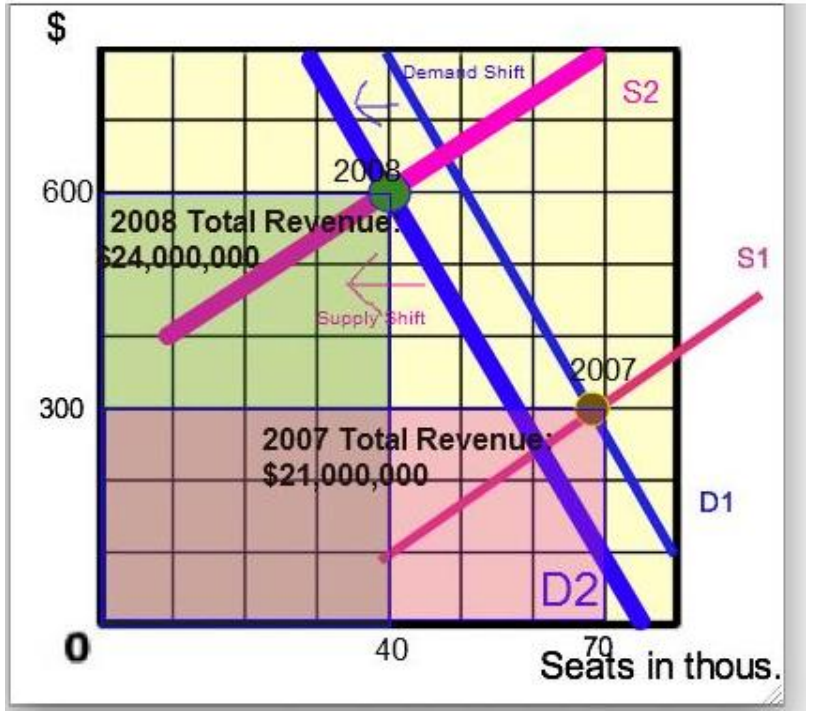
  Example: Oregon Trail - https://archive.org/details/msdos_Oregon_Trail_The_1990

https://www.classcraft.com/#modal-how-to-play

Graphing as an Activity

Source: Oskar Harmon, Ph.D. (2016)





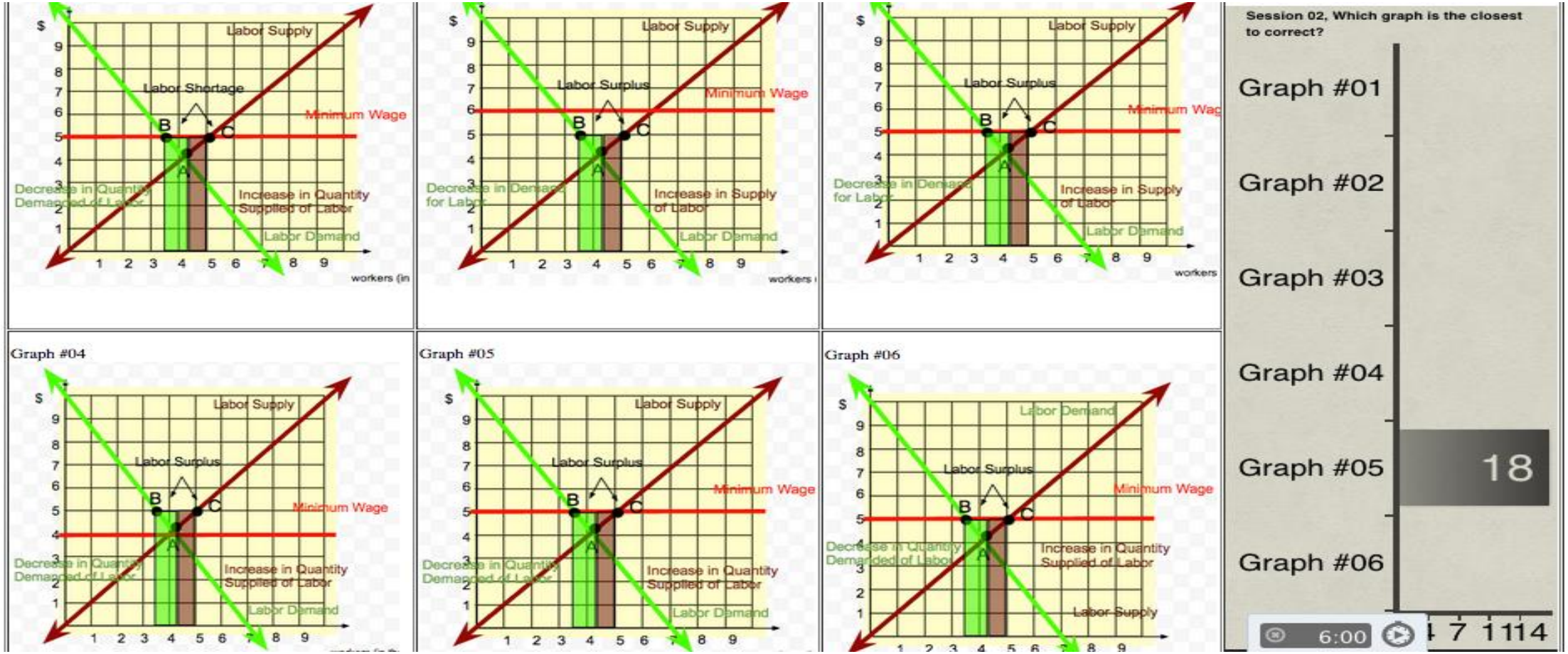
Initial Diagram

Sample Student Diagram & Short Answer:

Despite the downturn in air travel, the revenue increased in 2008 from the previous year due to the large leftward shift of the supply curve. The demand curve also had a leftward shift, yet is was much less, making the equilibrium price high. The equilbrium price increased more dramatically than the decrease in quantity. The revenue increased due to the increase in revenue area. To find the revenue you must find the area of the revenue rectangle. To do this the equilibrium price is multiplied by the equilibrium quantity. In 2007 the total revenue was 70000 x 300 = $21000000. In 2008 the total revenue was 40000 x 600 = $24000000.

Identify Correct Graph

Source: Oskar Harmon, Ph.D. (2016)



Gamifying your Class

- Can you identify a topic in your course which can be framed as a “quest”?
- What kind of leaderboard, badges, points, and level up tracks can you introduce within this quest?
- Other thoughts on gamifying your course?

Gamifying your Course - Recommendations

- **Make students co-creators of the design of your course**

- **Make it competitive**
  - Competition that is encouraging, without being too competitive
  - Include elements that reward effort, strategy, and have probability/chance

- **Capitalize on technology affordances**
  - Top Hat Blog: https://blog.tophat.com/gamified-learning/

    (Pros and Cons)

Applying Universal Design in an Economics Course at Landmark College

Faculty Member – Jim Koskoris