Learning by Doing – Simulations, Games, Experiments and Exercises for Agricultural Economics

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"If you bet on a horse, that's gambling. If you bet you can make three spades in poker, that's entertainment. If you bet cotton will go up three points, that's business. See the difference?"
William F. Sherrod on succeeding in a competitive world.

- Successfully using simulations and games in teaching undergraduate agribusiness marketing and management classes to today's millennial students requires a bit of magic, entertainment, business savvy, and some luck.

- Include simulations, games, experiments and exercises to complement lecture and textbook presentations, not replace; encourage students to make decisions and interact so as to increase interest and decrease skepticism about economic theory.

The 'Ah? Ha!' teachable moment is no longer one-at-a-time, but in mass or in groups.

- Physical participation to find solutions can't be done using smart phones, computers, or social media at one's desk – must get involved.
- Create a competition for learning – team building exercises; consensus ('we-we-we') decisions versus individual ('me-me-me') decisions.
- Must have a teachable moment, an objective or expected learning outcome for each simulation and/or game.
- Even known to reward for poetry, raps or lyrics written for application of key concepts, principles, or theories.

The Millennial Students – how to engage and how they learn:

- Born 1978 – 1996; many have the 'me-me-me' narcissistic disease; expect trophy for participation (not matter of success/failure, satisfactory/unsatisfactory, win/lose)

- More diverse; more with some college education; less religious; less marriage; more home stay; more optimistic; less military service; more causes; more body piercings other than the ears; more tattoos.

- Always connected (75% have a social media profile).

- Do not have either need or knowledge of how to build relationships with authority figures, including teachers.

- How to engage the millennial students:
  - Give them the big picture, as they seemingly want to contribute
  - Help them find the 'me' in team, by providing assessments of ways to contribute
  - Mentor them, even if they choose to ignore the chain of command, by providing rules and guidelines for contributing

- How the millennial students appear to learn:
  - In line with what marketers say – tell the 'why' story (not the facts); create an emotional connection; don't promote; encourage discovery!
  - VARK – visual, auditory, reading/writing, kinesthetic

AAEC-3100, Food and Fiber Marketing

- Coke versus Pepsi — trading decisions
- The Snicker Effect — market demand and demand elasticities
- Market for Lemons — market conduct, structure, and performance
- Cookie and Milk — benefits of trade, efficient allocation
- Creation of Menus — auction market
- Decision by Consensus (Staying Alive, NASA, Avoiding Catastrophe and Accidents)

AAEC-3200, Selling in Agribusiness

- Door-to-Door — need a prospect first
- Trade & Production Possibilities Functions — generate production /cost data
- Free Market Entry/Trade Zones — zero economic profits
- Favorite Television Program — why oligopolies likely collaborate or form a cartel

AAEC-3980, Introduction to Agribusiness Management

- Quality Airplanes — plan, produce, and market
- Prisoner's Dilemma — illustrate conflict between social incentives to cooperate and private incentives to defect
- Tennis Balls — diminishing marginal returns and diminishing marginal productivity
- Production, Cost and Input Demand — labor & costs
- Changes in the Money Supply — multipliers

AAEC-4980, Agribusiness Management

- Quality Airplanes — plan, produce, and market paper airplanes
- Prisoner's Dilemma — illustrate conflict between social incentives to cooperate and private incentives to defect
- Tennis Balls — diminishing marginal returns and marginal costs
- Production, Cost and Input Demand — labor & costs
- Football Play Calling — strategy development

An N-Person Experiment for You to Do Now.

- Each person is considering taking one of two routes to work. Suppose the time required to take route 1 is given by:

  $5 + 3q$.

- Suppose the time required to take route 2 is given by:

  $9.55 - 4q$.

- Note that q is the proportion of the persons that choose route 1.

- Those who would like to take route 1 as the fastest route, please move toward the wall to your right. Those who would like to take route 2, please move towards the wall to your left. You have about 2 minutes to make your choice; you may switch sides as many times as you want in the time allotted, but if caught in the middle when time's up, you've been run over and are out of the experiment. [breakeven?]

The Law of Diminishing Marginal Returns

- You are part of the inputs required to generate a factory's short-run production function.
- Equipment used: two pails or waste baskets, a number of practice golf balls, a stopwatch, and a whiteboard to record the results.
- Any volunteers for the timekeeper? The output recorder? The rest of you are eligible as volunteer workers on the "production line."

- The first volunteer worker is to pick up one ball at a time, from the pail of practice golf balls, go to the other pail about 20 feet away, place (not toss) the ball in the other pail, and then return to the first pail to collect the next ball.
- The goal is to transfer as many practice golf balls as possible from the first pail to the second pail in 30 seconds (timekeeper).
- A worker can only handle one ball at a time, and must treat them a little like eggs in that if a ball is dropped or tossed, it is broken and not worth attempting to pick up.

- At the end of the 30 seconds, the total number of balls completely transferred from one pail to the other is recorded on the whiteboard (recorder).

Labor Inputs	*Total Product*	*Average Product*	*Marginal Product*
0	0	----	----
1			

What would have speeded up the process to transfer more practice golf balls, leading to more productivity?

Another worker (input) in the fixed production function, perhaps; so add a second worker and repeat the production process, being sure to physically hand the ball to the co-worker (no tossing, otherwise treat as the egg being broken). Laborer must wait until ball being transferred is placed in the pail before picking up the next ball.

As more workers are added to the production process, each worker must handle every ball on each production run, while waiting for the ball to be placed in the second pail prior to initiating the next "production run."
Observe the results with multiple workers in the production process.

What happens when apparently too many people (inputs) are part of the production process? If graph the results, identify total physical product, average physical product and marginal physical product; also identify point of maximum contribution, maximum efficiency, and maximum output. Discuss the relationships between these six production concepts.

Game Theory

- To better comprehend the risk-reward of game theory, an experimental account fund (normally $20) is collected from each student and put in an account with the departmental business office .
- Individual records of gains and losses are maintained by the instructor.
- All funds are paid back to students at the end of the semester, according to their account balances.
- Provost is notified, prior to collecting the fee, of the purpose and process of the account – we're not gambling.

Bertrand Equilibrium Experiment – Pricing

- You are in competition to sell an item. You will be randomly sorted into approximately equal sized groups of 4 – 5.

- The game is simple. You each offer to sell a unit of product to me. The highest price you can charge me is $12.00 and the lowest price is zero ($0.00). I will randomly sort you into one of the groups. The person who has the lowest price in your group wins, and I will "purchase" the product from that person.

- If you have the lowest price in your group, I will add the amount of your price to your account. Everyone else wins nothing. If there is a tie for the lowest, I will flip a coin to see who in the group I will purchase the product from.

- Name _____ I choose to bid $_____

Bidding on Pennies

- You are bidding on a jar of pennies. The winner wins the value of the pennies (not the actual jar and pennies), and his or her earnings will be equal to the value of the pennies minus the bid price.

- The highest bidder wins, and he/she pays the price of the bid that he/she submitted. Any winnings will be added to his/her experimental account fund. If the winning bidder bids more than what the pennies are worth, the difference between the value of the pennies and the bid will be deducted from that individual's experimental account fund.

- Name (won't be made public):_____

- Bid: $_____

Beauty Contest

- Name _____

- You must choose a number between 0 and 100. Everyone else in the class must also choose a number between 0 and 100. (Note: you may use decimals, should you want to be more precise than just using an integer.)

- The person whose number choice is *closest to half of the mean (average) number chosen for the class* will win the prize.

- The number I choose is _____.

Rewarding Participation and Learning

- Those activities that involve products, such as Coke versus Pepsi, the Snicker Effect, or Market for Lemons, distribute items to 'winners'.

- Normally, no extra or bonus participation points (test or quiz grades for learning concepts and principles); after all everyone participates [exception when rewarding attendance].

- 'Talent' presentation in front of classmates for poetry, raps, or song lyrics – acknowledgement posted on eLC (Blackboard), Facebook, 'selfies', Instagram, Pinterest, YouTube, etc.

For ‘how-to’ directions for any of the games, simulations, or exercises mentioned, contact:

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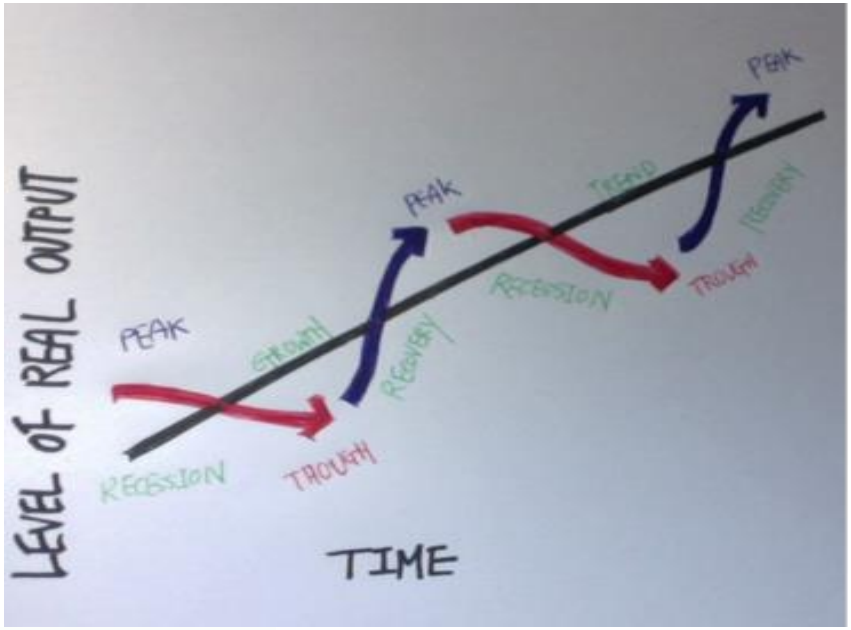
Copies of a handout with 30+ games, simulations, experiments and exercises available from Dr. Forrest Stegelin

Thank you for your attention and interest. Are there any questions or comments?



Selected References

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