Workshop on “Teaching Supply Chain Mgmt. via Games”

Hunger Chain

Mummy bird only has one worm, whom to give it to?

Flora PARK

A Supply Chain Contracts and Collaboration Simulation

FloraPark – A Supply Chain Contracts & Collaboration Simulation

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Agenda

- Why FloraPark?
- Learning objectives
- Teaching plan
- Feedback
- Let’s play

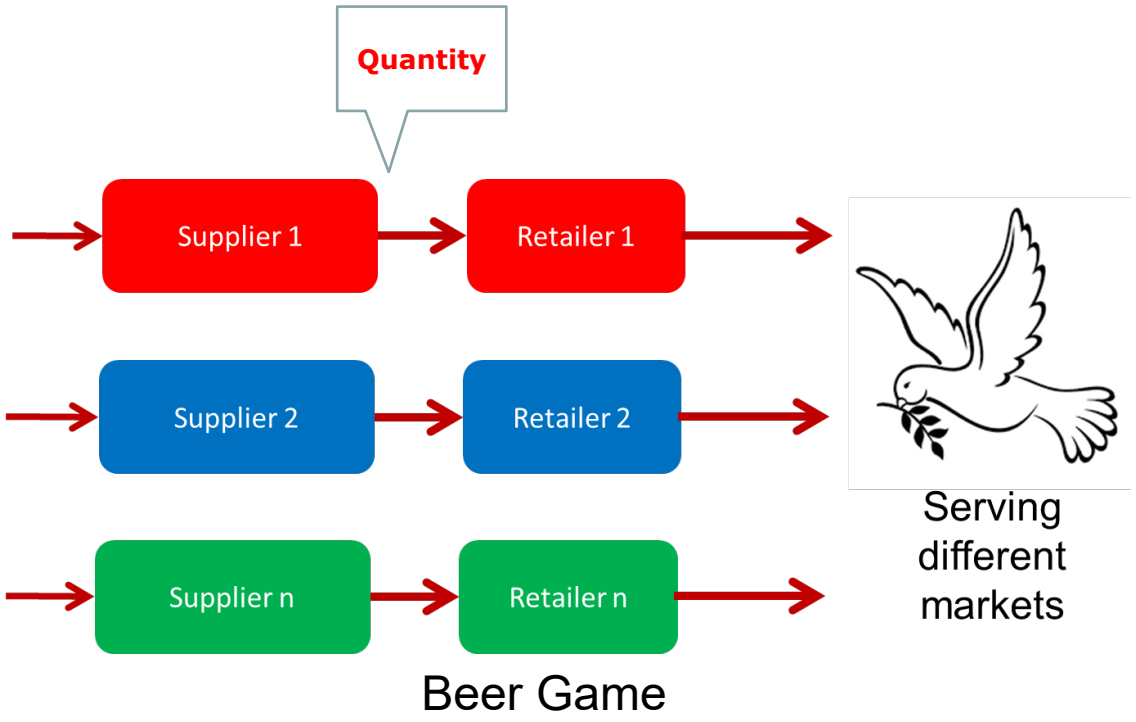
FloraPARK

A Supply Chain Contracts and Collaboration Simulation

Why *Flora*PARK?

The Beer Game

- Beer game simulates order quantities in non-competing supply chains.
- Trading partners negotiate not only quantities but also prices, which leads to conflict of interests, and supply chains are competing;

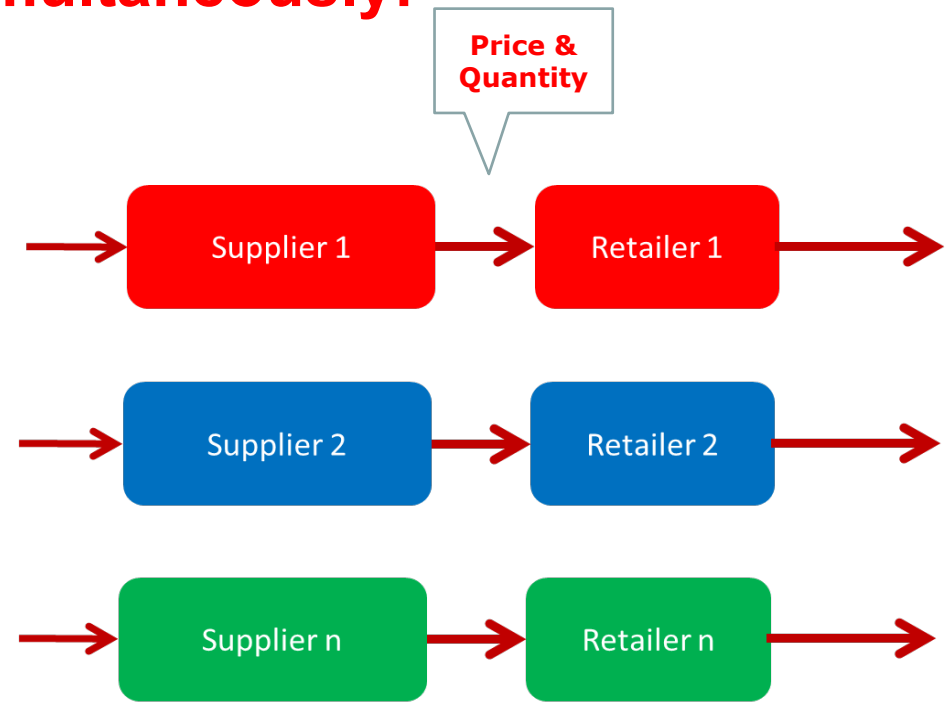


Beer Game

Serving different markets

The Flower Game

- Flower game simulates both order quantities and prices in competing SCs.
- Trading partners must **collaborate with & fight against each other simultaneously!**



Flower game

Competing in one market

Why *Flora*PARK?

vs.

Beer Game

FloraPark

Learning Objectives

Learning Objective

How to balance self-interested actions (to get a larger share of the pie) vs. collaboration to compete against other supply chains (to increase the pie)?

A Supply Chain Strategy Game

- **Supply chain coordination via contracts**: Students experiment on various price & quantity contracts to learn how to go from back-stabbing to win-win / collaboration.
- **Total business game**: Students play the c-suite team perspective, make strategic decisions on supply chain, marketing and product strategies.
- **Negotiation** and **teamwork**: experience the intensive negotiation among trading partners.

Key Lessons

- If you fight your partner, your supply chain cannot win.

Live as one or die as two

- Even if your supply chain wins, you may not.

You may sacrifice yourself
for your partner's success

Teaching Plan

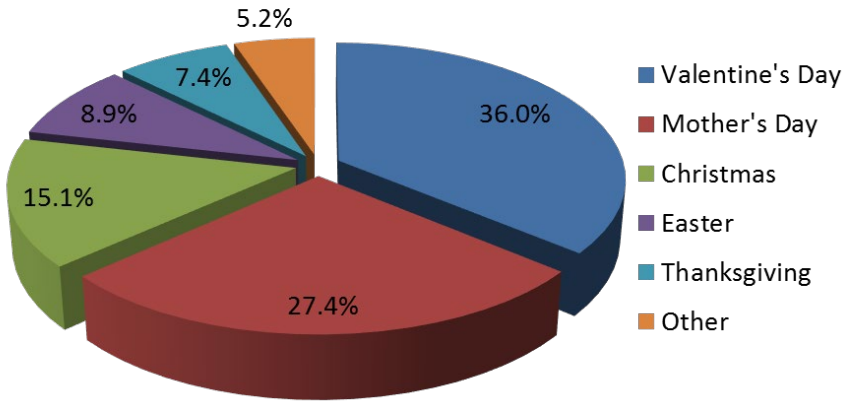
Teaching Plan

Topics & Lectures for Interactive Sessions	Before Game Round
1. Supply chain challenges & key lessons	1st
2. Strategic thinking, supply chain and marketing interfaces	2nd
3. Teamwork and group decisions	3rd
4. Coordinate supply chain via price & quantity contracts	4th
5. Competitive supply chain strategies	5th
6 & 7. Negotiation, game trajectory	6th
8. Reflections – From Game to Reality	Reality-show

Expected duration for 6 rounds: 6-9 hours, in or off-class. Contract negotiation takes time!

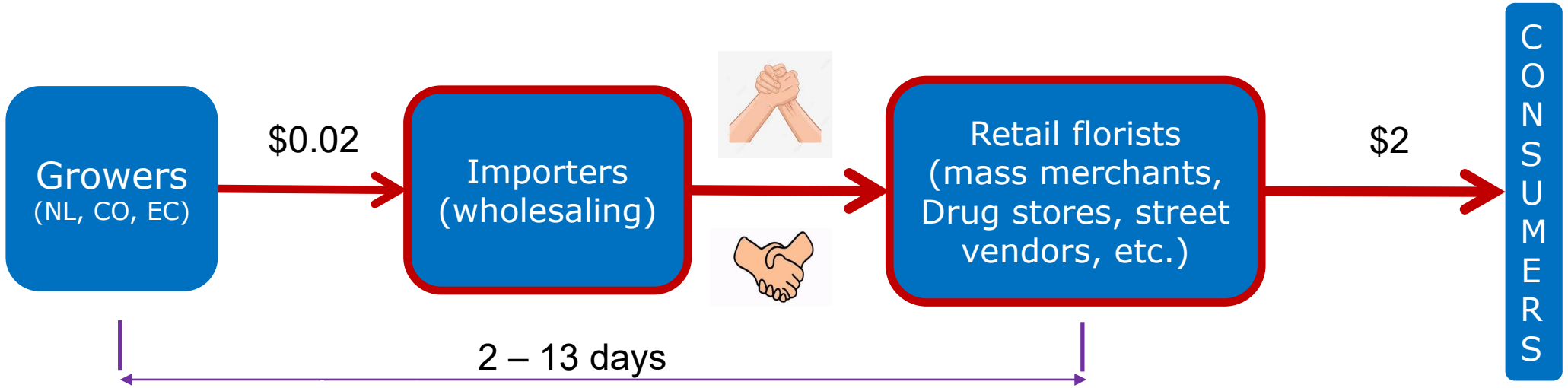
International Flesh Flower Supply Chain

- Represents supply chain challenges
  - Perishable items
  - Long lead times and huge yield losses
  - Highly seasonable and unpredictable demand



  - Relates to everyone
  - Intensive market competition
  - Indispensable players with conflicting interests

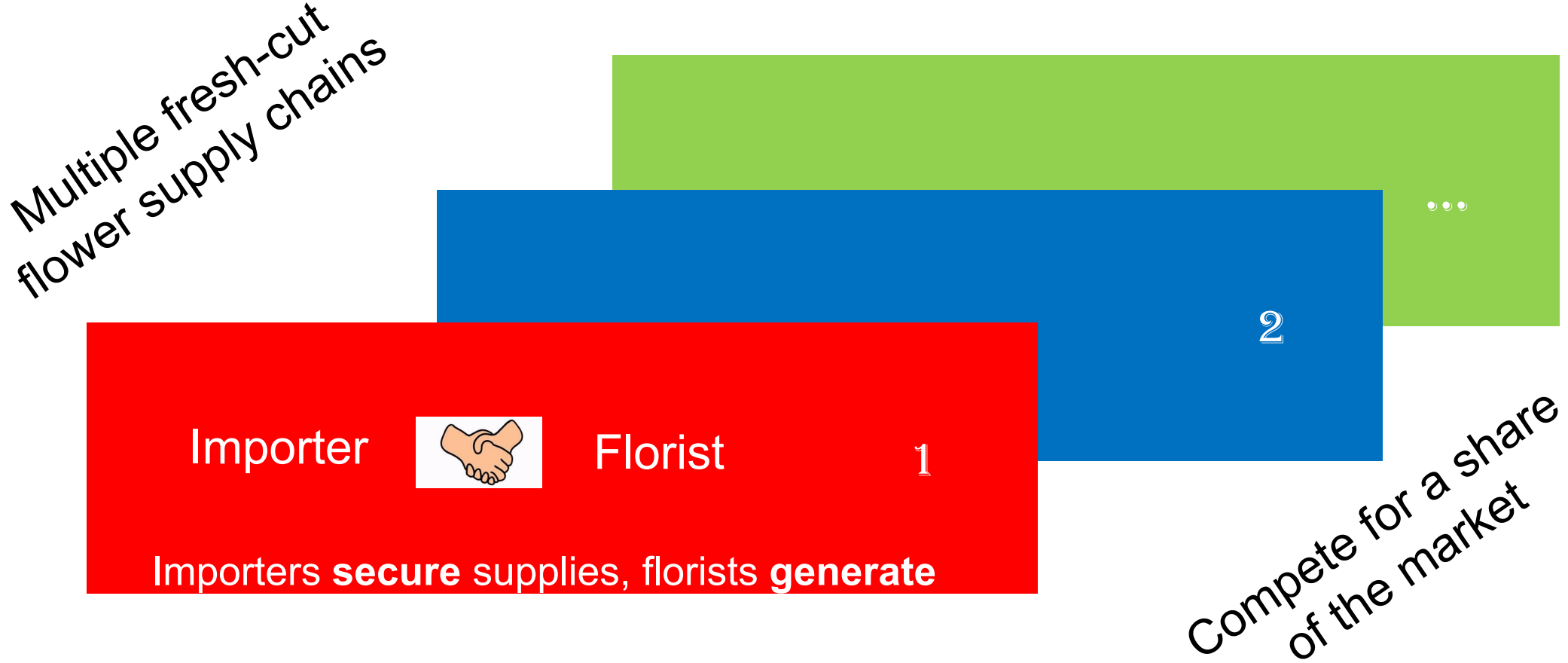
Fresh Flow Supply Chain



Brokerage, customs,
storage, shipping, …

Decoration, storage,
selling, …

A Collaborative and Competitive Environment



Game Features

- **Supply chain contracts:** pull, push and advanced purchasing discount contracts*.
- **Realistic complexity:** Three product lines / market segments with different responses to price and marketing mix.
- **Total business game:** integrate marketing and supply chain decisions.
- **Dynamic gaming**: start out identical, teams play six periods (years) to win in the end.

* Gérard P. Cachon (2004), Management Science 50 (2); Lingxiu Dong, Kaijie Zhu (2007), M&SOM 9 (3)

Sequence of Events

Florist places the 1st order in advance at a discounted wholesale price. Importer then secures the supply from growers

If needed, florist may place the 2nd order at the regular wholesale price. Importer fulfills as much as inventory is available

* Gérard P. Cachon (2004), Management Science 50 (2); Lingxiu Dong, Kaijie Zhu (2007), M&SOM 9 (3)

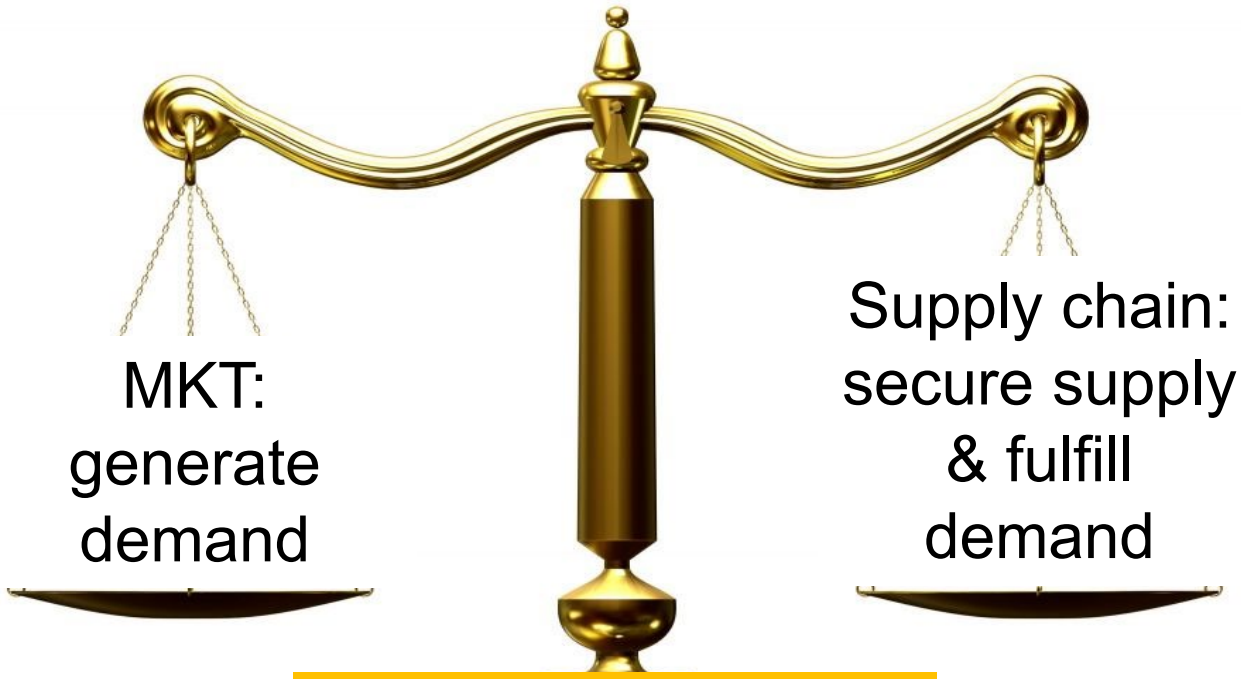
Supply Chain Contracts

- Advanced order (push contract): florist holds inventory and waits for demand.
- Last-minute order (pull contract): florist pushes inventory to importer, orders as needed in season.

	Advanced order (Push)	**Last-minute order (Pull)**
Pros	Price discount & guaranteed supply	Less budget required, No inventory risk
Cons	High inventory risk, High budget requirement	Short supply & higher cost

- Hybrid strategy (advanced-purchasing discount contract): florist buys the sure amount before the season and raises the regular wholesale price to encourage the importer to hold additional inventory just in case.

Supply Chain & Marketing Interface



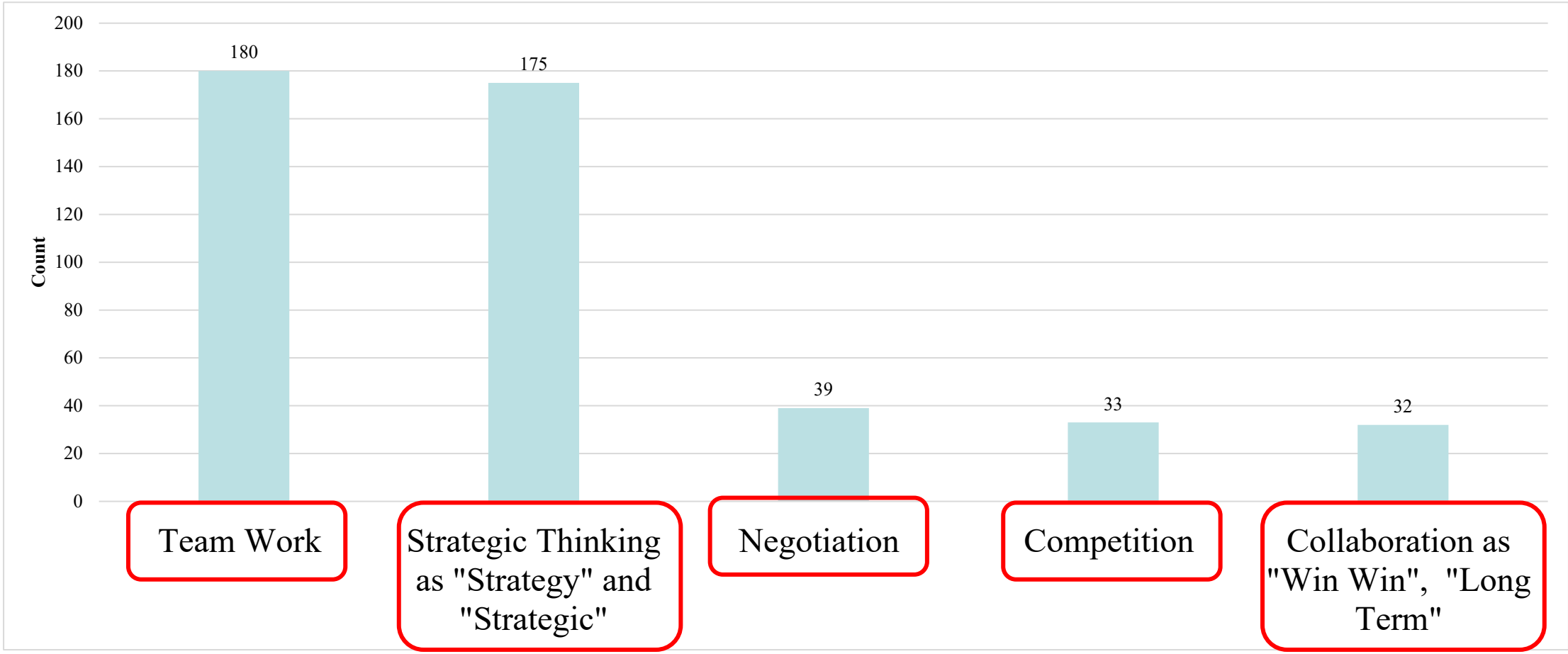
Limit budget

You must have both high demand (generated by florist) and high supply (secured by importer) to win.

Feedback

- **Courses and audience**
  - **Courses:** Supply Chain Management, Supply Chain Analytics, Procurement / Sourcing.
  - **Target audience:** Undergraduate, Graduate (MS, MBA), Executive Education Students.
- **Games stats:** ~30 instructors, 400+ student teams, 120+ games

Student Top Learnings From the Game



Student Feedback

- "*The supply chain strategy games [FloraPark] in second half of the course were exceptional learning experience.*"
- "*The best part about the FloraPark simulation was the conflicting motivations between the firms in the supply chain. … There must be a careful balance between self-interested actions to capture the maximum amount of value from the supply chain and collaboration to compete against the other supply chains. …*"
- *"We noticed other supply chains tried to profit at the expense of their partners by raising prices. This affected their ability to collaborate as groups."*
- *"I realized that supply chain visibility is very important and as we shared our demand forecasts with the importer, he was able to plan better and cater to our demand."*

The Winning Strategy (by Students)

- "Part of our supply chain strategy was for the importer to carry most of the inventory risk. Since we were carrying this risk, we were able to negotiate better x2 prices in order to be compensated for the risk. This was beneficial for the entire supply chain as it allowed the retailer to invest more in marketing. Their investment in marketing allowed them to obtain a significant percentage of the market share and to become extremely profitable. Since our retailer was profitable, there were able to pass on some of the profitability to us for holding their inventory. We were critical to each other's success and our strategy would not work if both of us didn't participate. Our combined strategy was greater than any individual strategies we could have."

INFORMS Transaction on Education Paper:
https://yzhao12345.github.io/assets/doc/FloraPark_paper.pdf

Teaching Effectiveness Assessment

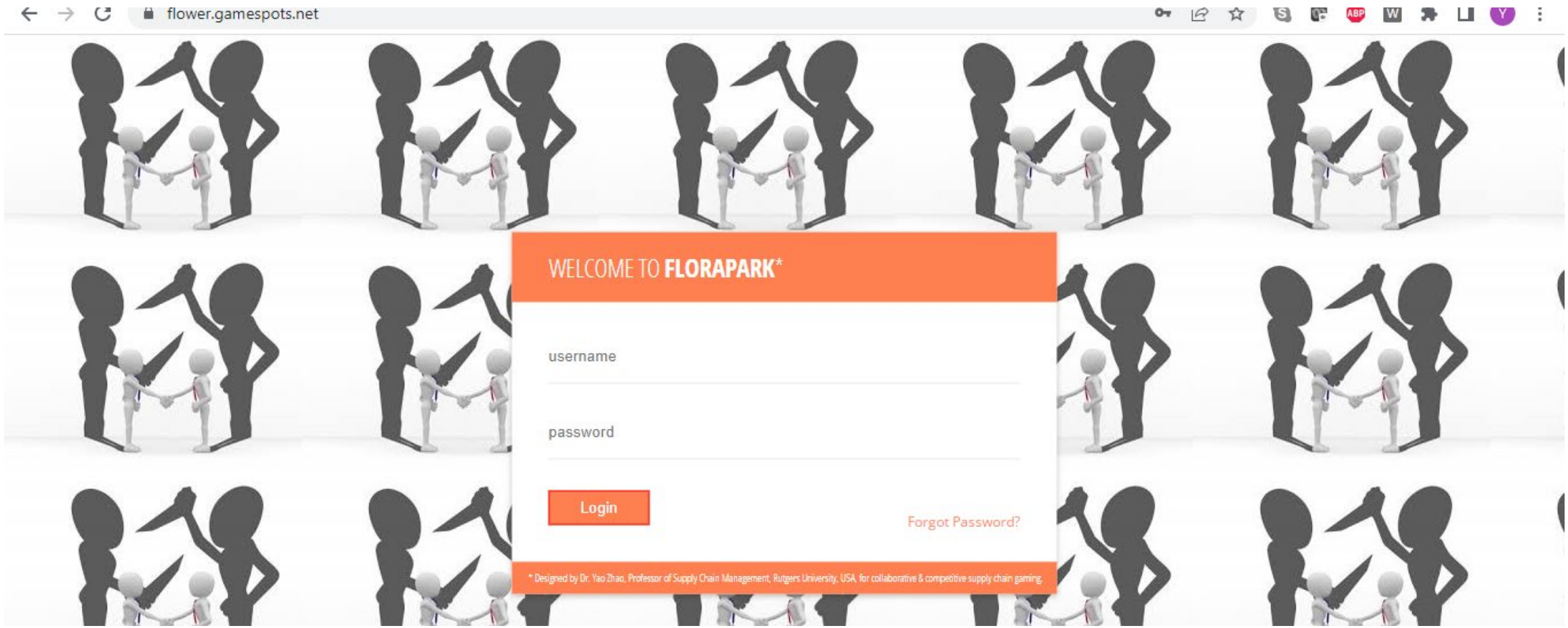
	Very difficult	Difficult	Neutral	Easy	Very easy
1. Understanding and playing the FloraPark game in one lecture was…	2 (6.67%)	9(30%)	9(30%)	7(23.3%)	3 (10%)
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
2. The FloraPark game has increased my understanding of **supply chain collaboration and contracts.**	0 (0%)	6(20%)	6(20%)	11 (36.67%)	7 (23.33%)
3. The FloraPark game has improved my understanding of **supply chain competition**.	1 (3.3%)	4 (13.3%)	4 (13.3%)	14 (46.7%)	7 (23.3%)
4. The FloraPark game has improved my understanding of **teamwork, communication, and negotiation.**	1 (3.3%)	3 (10%)	4 (13.3%)	11 (36.7%)	11 (36.7%)
5. The FloraPark game has improved my understanding of the **integration of marketing and supply chain decisions**.	1 (3.3%)	3 (10%)	7 (23.3%)	8 (26.7%)	11 (36.7%)
6. Thanks to the FloraPark game, I'm more convinced that real-life problems can be modeled and studied with educational games.	1 (3.3%)	4 (13.3%)	2 (6.7%)	9 (30%)	14 (46.7%)

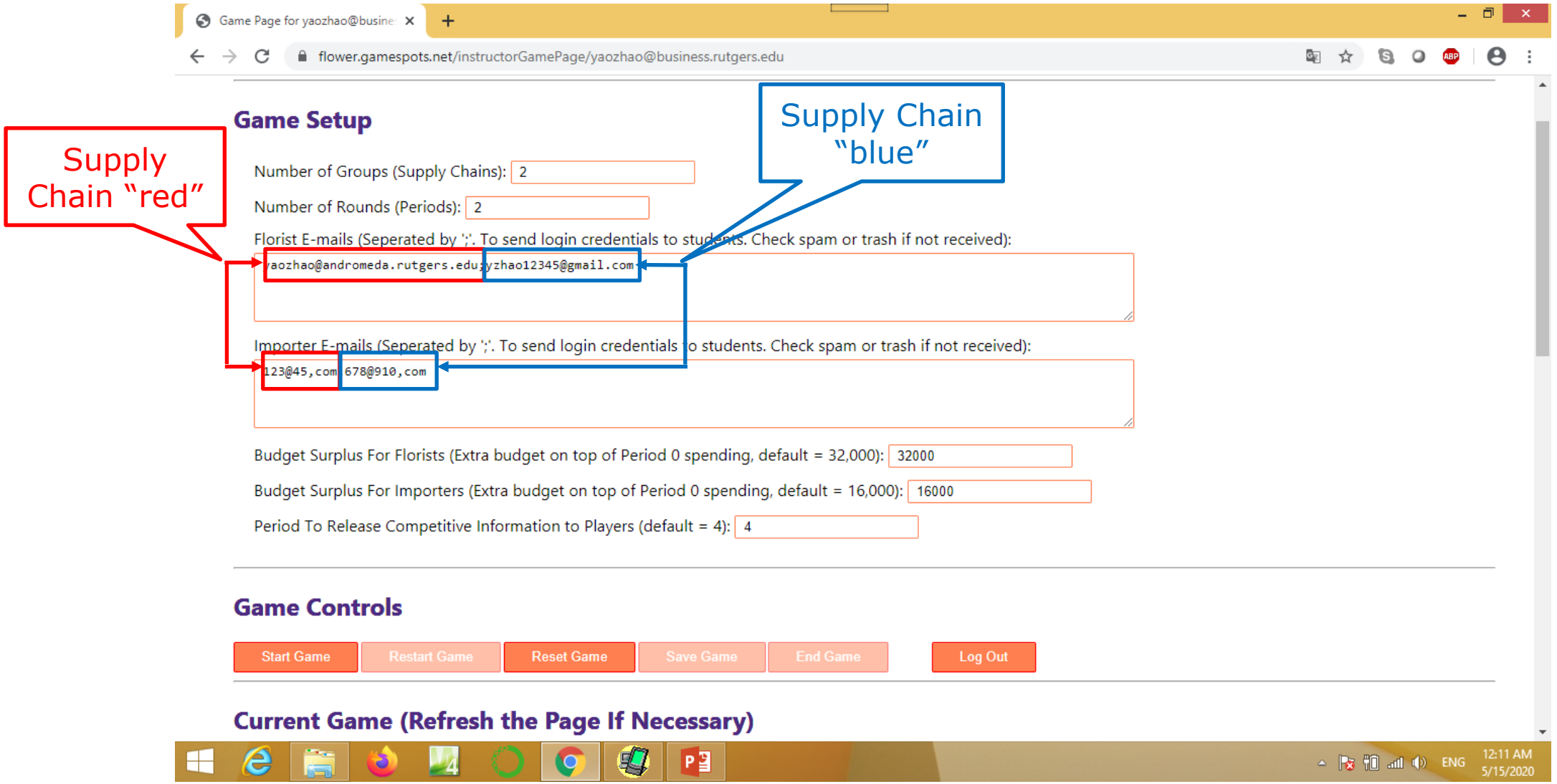
Recap

- **Supply chain contracts & collaboration**, one of the most important topics in SCM, hard to teach but easy to play.
- Students can experiment on various price-quantity contracts and find the win-win strategy (coordinating contract) by themselves.
- Students gain valuable experiences as c-suite teams to integrate supply chain and marketing decisions.

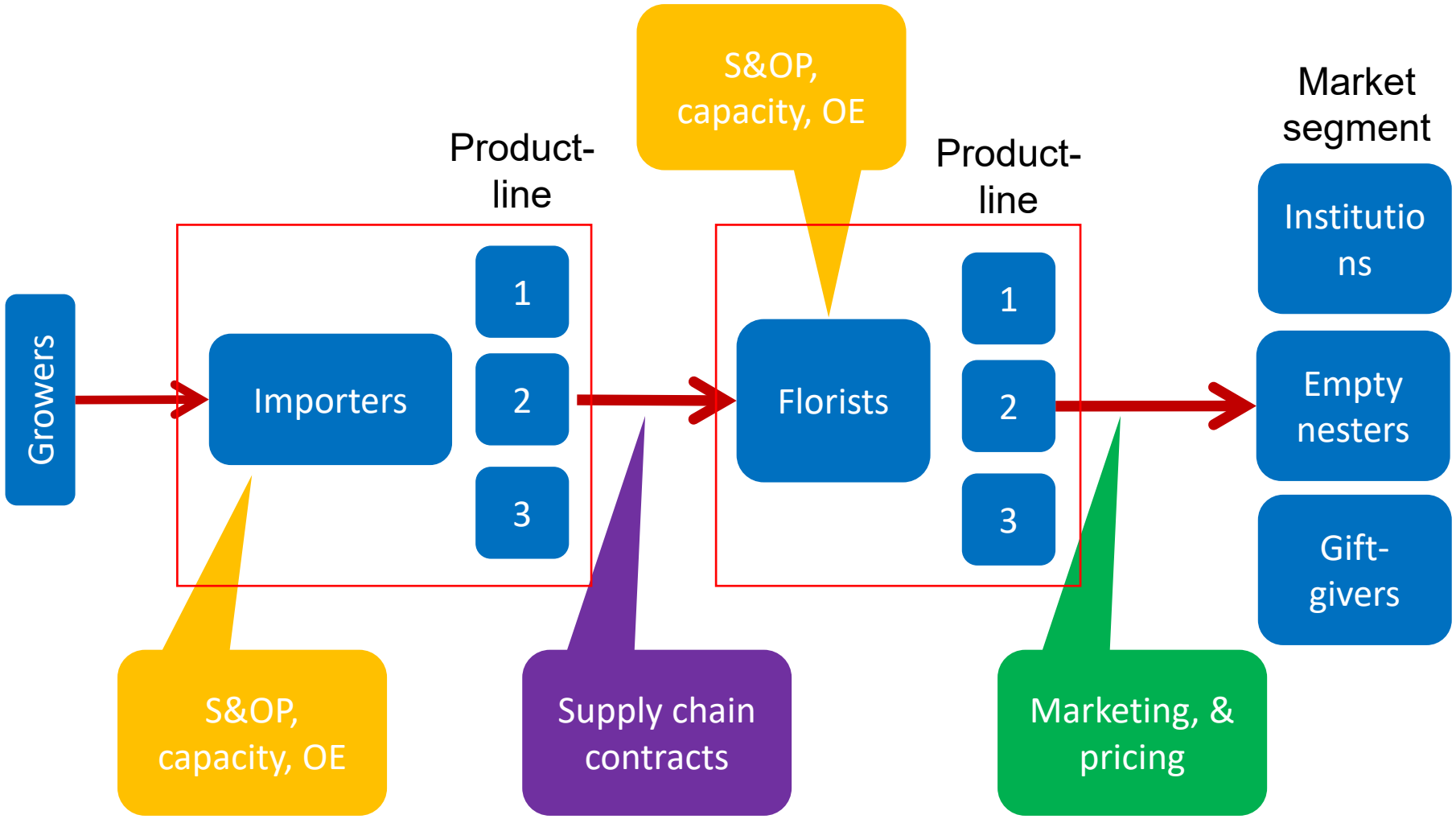

let's
PLAY

Instructor Account (Please email yaozhao@rutgers.edu)

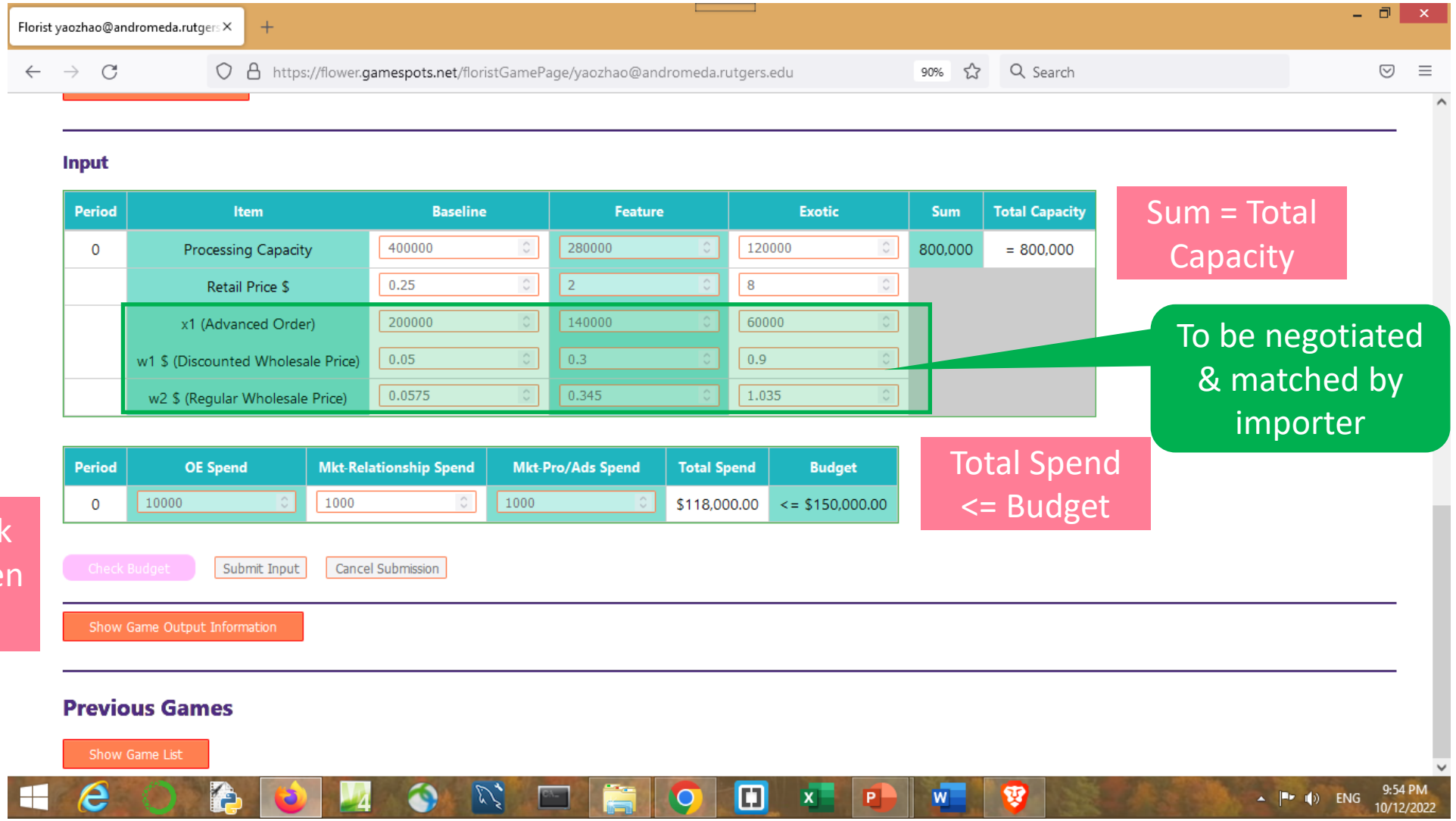



Supply Chain "red"
Supply Chain "blue"
Game Page for yaozhao@busine
flower.gamespots.net/instructorGamePage/yaozhao@business.rutgers.edu
Game Setup
Number of Groups (Supply Chains): 2
Number of Rounds (Periods): 2
Florist E-mails (Seperated by ';'. To send login credentials to students. Check spam or trash if not received):
yaozhao@andromeda.rutgers.edu;yzhao12345@gmail.com
Importer E-mails (Seperated by ';'. To send login credentials to students. Check spam or trash if not received):
123@45,com;678@910,com
Budget Surplus For Florists (Extra budget on top of Period 0 spending, default = 32,000): 32000
Budget Surplus For Importers (Extra budget on top of Period 0 spending, default = 16,000): 16000
Period To Release Competitive Information to Players (default = 4): 4
Game Controls
Start Game
Restart Game
Reset Game
Save Game
End Game
Log Out
Current Game (Refresh the Page If Necessary)
ENG
12:11 AM
5/15/2020

Supply Chain Partners & Actions



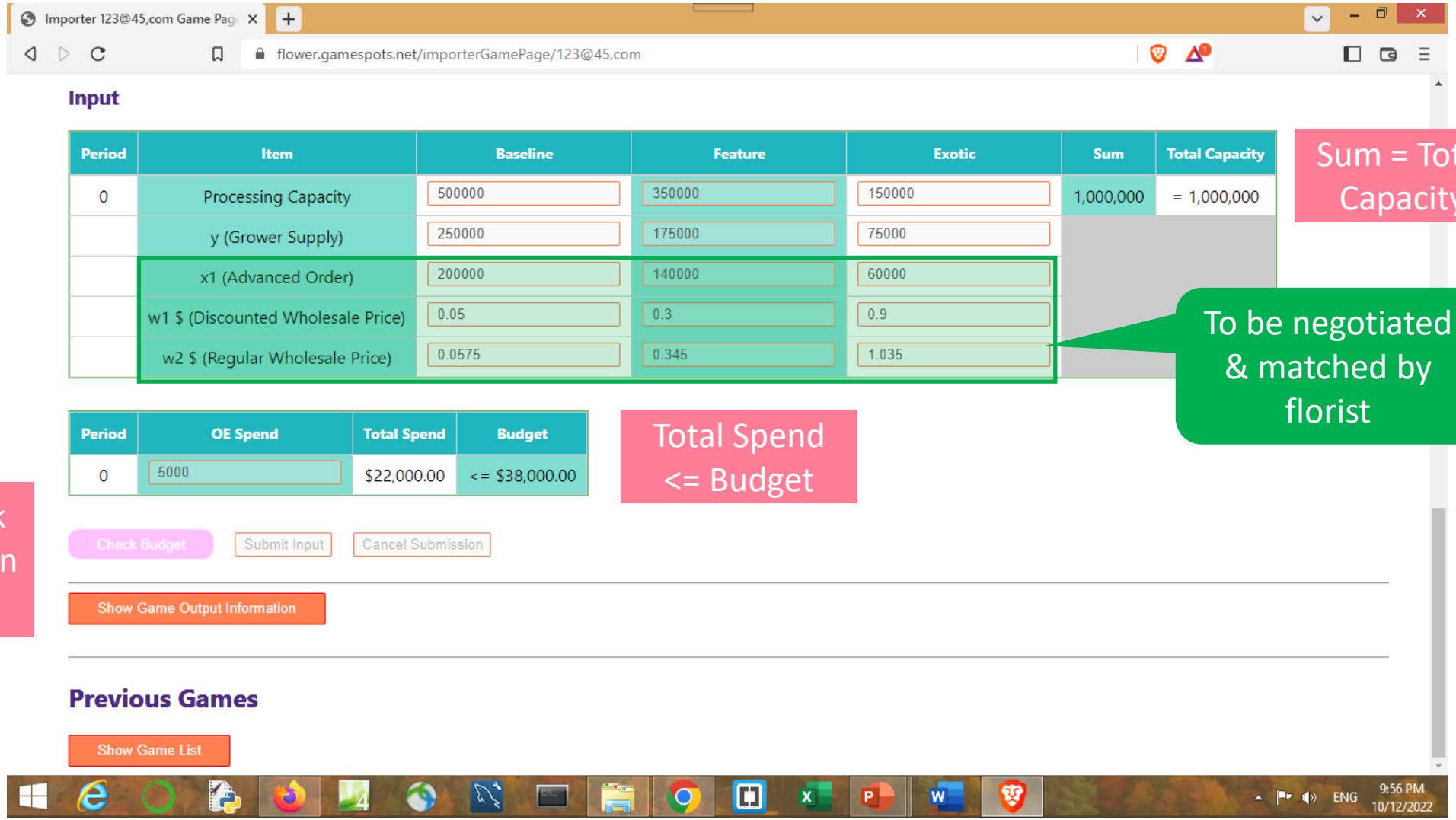
Florist Decisions



First "Check Budget" then "Submit"

The budget comes out of your pocket!

Importer Decisions



First "Check Budget" then "Submit"

The budget comes out of your pocket!

Product-Lines & Benchmark Pricing

	Baseline (low end)	Feature (medium)	Exotic (high end)
Growers	$0.01	$0.04	$0.1
Wholesale	$0.05	$0.3	$0.9
Retail	0.25	$2	$8

- Price increases significantly along the supply chain!

Market Segments & Pricing Sensitivity

30%
Institutional buyers
(wedding, funeral, parties, hotels, conferences, etc.)
Price sensitivity: medium
Demand uncertainty: low

30%
Empty nesters
Price sensitivity: high
Demand uncertainty: medium

40%
Gift givers
Sensitivity: low
Uncertainty: high

Market Response

- Market share responds **positively** to
  - **Lower** retail price
  - **More** marketing $: relationship and promotion/ads
  - **Higher** quality (operations excellence)
  - **Higher** service level (% of demand met)
  - **Larger** past share (inertia)

Market-Product Matrix

Products

Market segment

	Baseline	Feature	Exotic	Relationship vs. Promotion/ads
Institutions	65%	25%	10%	70% vs. 30%
Empty nesters	35%	50%	15%	30% vs. 70%
Gift-givers	25%	35%	40%	5% vs. 95%

- Total demand grows at 1-3% annually

Operations Excellence

- Investment in quality control, process improvement, and technologies
- **Higher** investment → **higher** quality, **higher** yield, **lower** maintenance and processing costs
- Spillover effect to trading partners
- “Roman is not built in one day”

For more information

yzhao12345.github.io/