The Center for Leadership Simulation and Gaming

NASPAA Simulation Workshop
October 17, 2019
Agenda

• Introduction
• Pandemic Game
• Host Nations
CLSG members here today

Andy Ortiz, MD
Senior Engineer

Adam Roux
Coordinator & Writer

Steven Parrott
Full Stack Developer
Mission

• We design, develop, and implement cutting edge simulations and experiments to advance education and research in leadership & public policy, and to create a community of scholarship in our methodology.

• Our Philosophy: “Tell me and I forget, teach me and I may remember, involve me and I learn”
  • Immersive, experiential learning tools: bridge the gap between the structured textbook learning to dynamic real-world problems
3 Characteristics

• Public Policy Focus
  • Learn about potential outcomes in policy settings
  • Economics, Political Science, Behavioral Science, etc

• Participatory Nature
  • Human element (roles)
    • Education in leadership

• Computer-based
  • Can be complex
    • Computationally and conditional
  • Scale
  • Flexibility
Participatory Simulations in Public Policy

- Better understand the complex issues we present (pandemics, refugees, health care systems, etc)
- Practice thinking analytically in the public policy arena using the limited information and tools at hand
- Find consensus and work with others
NASPAA-Batten Student Simulation Competition

2018 NASPAA-Batten Student Simulation Competition

February 24 & March 3, 2018

One Competition

The 2018 Topic: Pandemic Crisis Management and Global Health Security

Approx. 336 million infectious people in 44 infectious countries per infectious world, 3 deadly infectious diseases

Student Competitors

<table>
<thead>
<tr>
<th>Total Students</th>
<th>Countries Represented</th>
<th>Universities Represented</th>
<th>Student Teams</th>
</tr>
</thead>
<tbody>
<tr>
<td>563</td>
<td>27</td>
<td>159</td>
<td>117</td>
</tr>
</tbody>
</table>

2018 students, 7 countries, 159 universities, 117 student teams

Prominent Practitioner and Academic Judges

76

16 competition host sites on 8 continents

$10,000 USD in prize money for global winner and runner-up

Are you ready for the next global pandemic?

#NSSM2018

Policy

2018 Student Simulation Competition on Global Migration

February 22, 2019

2019 Topic: Global Migration Crisis

Why Now?

There are 26.4 million refugees and 3.1 million asylum seekers worldwide.

Student Competitors

<table>
<thead>
<tr>
<th>Total Students</th>
<th>Countries Represented</th>
<th>Universities Represented</th>
<th>Teams</th>
</tr>
</thead>
<tbody>
<tr>
<td>685</td>
<td>27</td>
<td>137</td>
<td>136</td>
</tr>
</tbody>
</table>

11 competition host sites on 4 continents

50 prominent practitioners and academic judges

12 regional winning teams & 1 global winning team

$5,000 USD in prize money for global winner

Are you ready to confront Global Migration Challenges?

#NSSM2019

Simulation & Gaming
Pandemic Game

Global Health Security Simulation

Motivated by 100 year anniversary of the Spanish Flu
Pandemic Simulation

• This is an interactive, stochastic, and continuous game where you are challenged to –
  • Make difficult public policy decisions in a fast paced environment with limited information
    • Your decisions impacts lives, politics, and the economy
  • Work effectively in a team environment
  • Interact with other teams; it is a GLOBAL pandemic

• You will be
  • Developing strategies to preserve **global health**
  • Making choices to fight against the **pandemic**
  • Considering **political** and **economic** impacts
Game Scenario

• Team consist of 3 to 5 players
  • Teams are assigned to a single country
  • Assigned following roles:
    • Prime Minister
    • Minister of Public Health
    • Minister of Finance
    • Minister of Communication
    • WHO Representative

• Each world consists of 4 countries
  • Countries within a world impact and interact with one another.

• These countries are based on real countries
System Dynamics

• Method used to understand complex systems using stocks, flows, feedback loops
S-E-I-R Model
Susceptible-Exposed-Infectious- Recovered/Removed

β is the effective contact rate
λ is the “birth” rate of susceptibles
μ is the mortality rate
k is the progression rate from exposed (latent) to infected
γ is the removal rate

\[ \dot{S} = -\beta SI + \lambda - \mu S \]
\[ \dot{E} = \beta SI - (\mu + k)E \]
\[ \dot{I} = kE - (\gamma + \mu)I \]
\[ \dot{R} = \gamma I - \mu R \]

Our simulation (country level)
Our simulation (world level)
Based on Real Countries

• Asland
  • Based on Chile

• Crogoon
  • Based on Seychelles

• Cheshireland
  • Based on Guangdong, China and Hong Kong

• Totora
  • Based on NE India: Uttar Pradesh, Bihar, Jharkhand, and West Bengal
Data used to build countries

- Population and culture
- Media Exposure and usage
- Employment rate
- Number of households
- Population distribution
- 2011 GDP by Sector
- Transportation usage, passenger versus cargo
- Exports and imports

Most data was collected from census records, statistical sites, and surveys.

Data was used to gauge policy impact variance between countries.
The Pandemic Game

ghs.batten.virginia.edu

Sign in as student

Don’t need to enter a real email (a@b.com is fine)
The Pandemic Game: Interface Walkthrough
Educational Objectives

• **Cooperation and Consensus Building**: issues like pandemics are global and cannot be solved by a single country; teams with conflicting interests must cooperate to resolve the situation

• **Crisis Management**: participants must learn to make effective decisions while the clock ticks down

• **Solving Complex Problems**: simple solutions or simplistic thinking cannot capture the complex of a policy issue

• **Critical Analysis of Data**: participants are required to make decisions with limited information

• **Public Health Policy**: give participants a sense of the concerns and what tools are available

• **Interdisciplinary Approach**: public policy and science should compliment one another
Simulation Structure

• 175 days in 30 minutes
• Instructor can determine death rate and country of origin (replayability)
• Inter-team communication via chat feature
• Negotiations and cooperation necessary to resolve the crisis without damaging economy
Policies

• Based off of policies that were enacted or proposed in past epidemics and in preparedness reports
• Impacts based on data collected in scientific studies, surveys, and reports
• Policies don’t always do what you’d expect
  • Closing schools
    • Can backfire, harm economy
  • Quarantine
    • Expensive and not very effective
  • Vaccines
    • Seasonal vaccines don’t protect against new strains
    • Not all vaccines develop effectively
  • Gloves, masks, and hand sanitizer
    • The flu virus can live 100x longer on gloves than on skin
    • Viruses are small enough to go through most masks
    • Distributing hand sanitizer can cause a condition of Risk Compensation
Check your countries!

Instructor: Pandemic
Default Death Rate: 2%
Number of participants: 0

<table>
<thead>
<tr>
<th>Country</th>
<th>Game Death Rate</th>
<th>Budget Left (%)</th>
<th>Economic Health (%)</th>
<th>Approval (%)</th>
<th>Global Health Fund Contribution</th>
<th>Global Health Fund Share</th>
<th>Score vs Previous Players</th>
<th>Score vs AI</th>
<th>Peer Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aaland</td>
<td>1.981</td>
<td>100.00</td>
<td>64.41</td>
<td>10.00</td>
<td>0</td>
<td>500,000</td>
<td>3.51</td>
<td>0.77</td>
<td>9.00</td>
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<td>Cheshireland</td>
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<td>100.00</td>
<td>62.63</td>
<td>49.30</td>
<td>0</td>
<td>500,000</td>
<td>37.17</td>
<td>90.87</td>
<td>0.00</td>
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<tr>
<td>Oregon</td>
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<td>100.00</td>
<td>57.87</td>
<td>10.00</td>
<td>0</td>
<td>500,000</td>
<td>2.00</td>
<td>0.11</td>
<td>0.00</td>
</tr>
<tr>
<td>Totals</td>
<td>1.993</td>
<td>100.00</td>
<td>66.12</td>
<td>10.00</td>
<td>0</td>
<td>500,000</td>
<td>11.41</td>
<td>1.28</td>
<td>0.00</td>
</tr>
</tbody>
</table>
Host Nations

A Refugee Simulation

Motivated by pressing global issue of forced migration
Simulation Structure: Welcome to Altrippa

- Migrants fleeing failed state move north
- Round-based for adaptable time frame
- Iterative, replayable
- Multiple time frames
- Four playable countries: Ottania, Durrit, Capalla, Urmm
- Each team has five roles: Prime Minister, ATG Delegate, Home Office Secretary, Minister of Labor, Minister of Health & Human Services
- Regional body to emphasize negotiations between team:
  - ATG (Altrippa Treaty Group)
  - Worlds that find a regional solution to the crisis do better than worlds where teams go it alone
Where did we get our data?

The game was built using data from the 2015/16 EU Refugee Influx

Specifically, we looked at four countries:

Urmm was built using data from Turkey
Capalla was built using data from Austria
Durrit was built using data from Hungary
Ottania was built using data from Germany
Where did we get our data?

- Apr - Oct 1980: 125,000 Cuban Refugees entered Miami, Florida

Findings:

Overall workforce earnings 8% higher vs. national rate
Low-wage earnings 20% higher vs. national
“Much evidence that unemployment is initially very high among recognized refugees, probably because many refugees do not immediately have the required qualifications, **starting with language skills**. The longer the refugees remain in Germany, however, it can be assumed that these obstacles will be gradually overcome, and thus the unemployment rate will slowly decrease over time”
Simulation Model (Country Level)
The Simulation Model (World Level)
Educational Objectives

Leadership, Critical Thinking, Consensus Building
• **Working in a team** environment with multiple teams
• Strategic Thinking: Defining and achieving a common goal
• Interactions with other countries: partnering and political savvy
• **Different conditions**: countries can contribute in different ways
• Within own team: leveraging diversity, conflict/crisis management, decisiveness and negotiating
• Learn potential policy outcomes in a **risk-free environment**
• Complexity and Shortcomings of Asylum & Refugee Policy
• **Trade-offs**: human rights and budget restrictions
• **Long-term benefits** outweigh short-term costs; weathering short-terms costs & downturns
• **Integration**: skills training, language training, housing, permission to work, freedom of movement
Login

http://hostnations.batten.virginia.edu

Please use Google Chrome only
Host Nations: Interface Walkthrough
“If managed properly, the inflow of refugees will have a small favourable effect on growth in the short and medium term. This will crucially depend on policies to integrate accepted refugees in the labour market.”