Supplementary information for: "Using AI to DIY? Incorporating AI-generated learning tools in the classroom"

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1 Steps to Host on Github Pages and Alternatives

GitHub Pages is one of the easiest ways to host your simulations in .html format for free, which students can easily access. You first need to create a free account: https://github.com/. Next, create a "New Repository", being sure to select the option to make it public (as well as possibly adding a readme file, which you could add links to the .html later). Once the repository has been created, click on "Settings" inside the repository, go to "Pages", and then select "Deploy from a branch" under the "Source" headline. Deploying from main/(root) is fine, although further customizations are available, just be sure to save these changes.

Once Pages has been set up, go back to the main repository and add your .html files to the main branch.[1] Once this has been successfully "pushed" to your repository, to access the file simply type: "https://[your GitHub name].github.io/[your repository name]/[your .html filename].html" to access. Additionally, you could use the README.md file to add links to specific simulations so students can quickly access multiple files by clicking.

Alternatives to GitHub pages exist, such as Netlify or Vercel, but in our experience these still require GitHub accounts so it is probably easiest just to use Pages. Another alternative, CodePen, does not necessarily require you

[1] Unless you are choosing to deploy from somewhere other than "main/(root)".

to create an account (you can just drop the .html file in if you "create a new pen"), although to save your file you do need an account. CodePen might be useful if the instructor is interesting in actually showing the underlying HTML/CSS/JavaScript code to students, as the different columns on the site allow you to do this relatively easily.[2] Again however, we think that simply using Pages or just physically sharing the .html files is easiest for most scenarios.

Last, keep in mind that all of the above sites create public .html files that can be accessed by anyone (unless you sign up and pay for a premium account). Instructors looking to keep their files private should probably physically share the .html files with students via email or upload it to a learning management system such as Canvas.

[2]This form of hosting could also help leverage the appeal of using AI in their classrooms by showing students how such simulations were created, which can help illustrate a practical application of AI for solving problems (Bachner and O'Byrne, 2021).

2 Free Tier Limitations in the French Revolution Simulation

As discussed in the manuscript, we frequently hit limits on the free tier of Claude, and creating a satisfactory simulation required us upgrading to the $5/month paid tier through the Poe app. We did try three other three popular AI's using their free tiers but they performed poorly. Meta AI hit its limit in just a few paragraphs of text, and wrote just four lines of HTML code:

```
<select id="faction">
  <option value="jacobin">Jacobin</option>
  <option value="girondin">Girondin</option>
  <option value="royalist">Royalist</option>
</select>
```

Grok 3 went further, creating a barebones interface that we could add scenarios too by hand in the HTML code; its output is shown in Figure 1. Last, Chat GPT created a 6-round scenario, but, as shown in Figure 2, choosing a faction did not appear to affect any future decisions, and there were only two choices in each scenario.

Figure 1: Grok 3 made a minimalist interface, but required the addition of further scenarios beyond the first

(a) Factions are produced correctly

(b) But we were prompted to select a faction after already choosing one

Figure 2: ChatGPT's limitations in the French Revolution simulation

3 More Illustrations

In addition to the four simulations shown in the main manuscript, below we present four additional simulations to help showcase how GAI can assist in generating good classroom simulations.

Example V: Illustrating Voting Systems

In our fifth example, we use Claude to create an simulation that illustrates how different voting systems affect electoral outcomes and party representation. Norris (2004) argues that electoral systems shape political behavior, yet students may have a hard time seeing the mechanisms behind vote-to-seat conversions. The nature of electoral formulas and their consequences on representation can be difficult to communicate effectively through more traditional lecture formats. This simulation allows students to observe changes in action through direct manipulation of variables like proportional representation versus majoritarianism.

As shown in Table 1, we made a simulation for voting systems in just three prompts. We created an interactive tool that demonstrates the relationship between electoral systems, party development, and voter behavior. Our initial prompt produced a strong starting point for the simulation with minor code errors that were corrected in the second prompt. The third prompt improved the simulation by adding a clearer visualization of the vote-to-seat conversion methods specific to each electoral system. Two screenshots of the

simulation interface and the final simulation are shown in Figures 3 and 4, which demonstrates all the key features we requested: three distinct electoral systems (majoritarian, proportional, and mixed), adjustable parameters for voter behavior and polarization, visual representations of seat distributions, and metrics for measuring disproportionality in representation.

Number	Prompt	Remaining Issues
1	"You are an instructor creating an interactive HTML file for a classroom simulation for university undergraduates. Create an interactive HTML simulation to illustrate how different voting systems affect election outcomes. For the voting systems, include majoritarian, proportional, mixed. For the outcomes, include the number of political parties and voter behavior. Economize on code and prompt length, but the simulation should still be detailed."	Three JavaScript errors: Canvas element issues, chart initialization problems, and undefined chart variables. The effects of different electoral systems on vote-to-seat conversion are not explicitly differentiated.
2	[Copied in the three errors for correction]	The vote-to-seat conversion methods need to be more distinct for each system.
3	"Ensure that each voting system has a distinct vote-to-seat conversion method. Add a visual representation showing how votes are translated into seats."	None

Table 1: Prompt Path for the Voting Systems Simulation
Note: Claude 3.5 Haiku used in "formal style", with analysis tool and HTML rendering enabled.

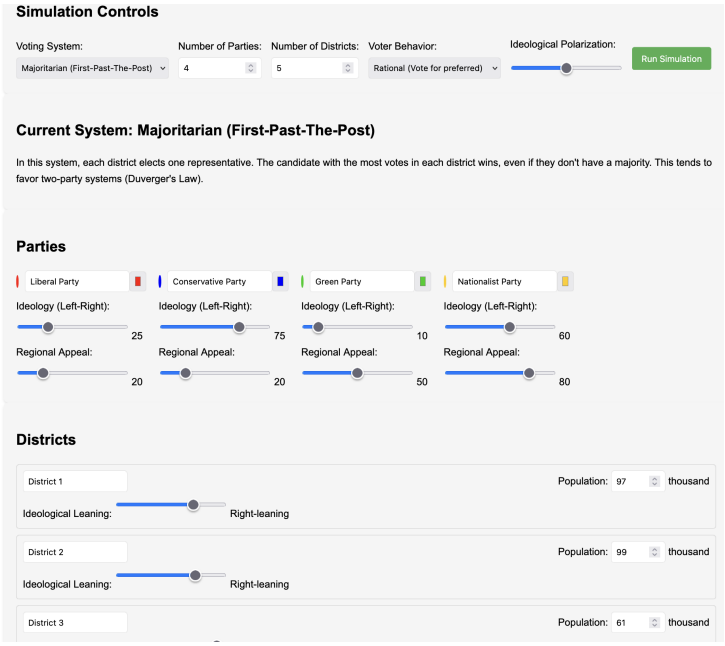


Figure 3: Voting Systems: Simulation Interface

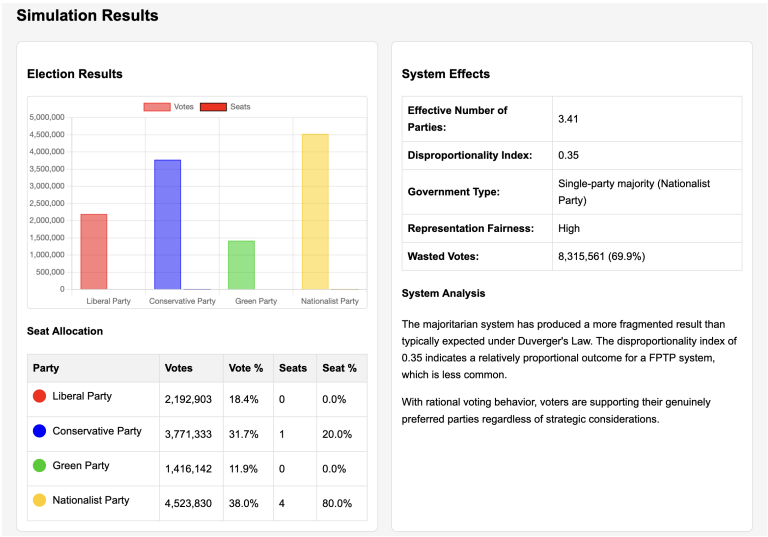


Figure 4: Voting Systems: Simulation Interface

Example VI: Balancing and Bandwagoning in a Multipolar System

In our sixth example, we use Claude to make an interactive simulation that allows students to experience the dynamics of international relations. Waltz (1979) and Walt (1990) write about how states form alliances to either balance against threats or bandwagon with powerful actors. Sometimes, these concepts often remain abstract for students without practical application. As Asal (2005) notes, simulations can transform theoretical international relations concepts into tangible experiences by having students engage directly with decision-making processes.

In Table 2, we were able to create a balance of power simulation using just four prompts. Our initial request produced a good starting point, but lacked a clean visual feedback for alliance strength. Moreover, it needed clearer incentive structures. The second prompt was then intended to enhance the simulation's visual elements and strategic complexity, while the third prompt focused on adding more sophisticated elements of uncertainty and realism. Our final prompt ensured the simulation captured the differences between balancing and bandwagoning behaviors with appropriate feedback mechanisms. A screenshot of the final simulation is shown in Figures 5, 6, and 7, including adjustable state capabilities, alliance formation tools, event cards that introduce unexpected challenges, and real-time feedback on system stability and power distribution.

Number	Prompt	Remaining Issues
1	"You are an instructor creating an interactive HTML file for a classroom simulation for university undergraduates. Create a simulation to model the multipolar international system where students form alliances to balance against threats. Include incentives for both cooperation and betrayal, and introduce unexpected events (e.g., a rising power, a sudden war) to test alliance stability. Allow players to renegotiate alliances as conditions change. Include these two issues: balancing vs. bandwagoning. Economize on code and prompt length, but the simulation should still be detailed."	Not enough visual feedback for alliance strength and relationships. Incentive structures for balancing versus bandwagoning need to be clearer.
2	Improve the visual representation of alliances and power distribution. Make the incentives for balancing versus bandwagoning more distinct with specific benefits and drawbacks for each strategy.	Event cards need more variety and unpredictability. Decision-making process needs more strategic depth.
3	"Add more complexity to the event system with a wider range of possible disruptions. Include technological innovation, economic crises, and domestic instability as potential factors. Implement a more sophisticated decision-making interface that requires players to consider multiple factors before committing to alliance choices."	The distinction between balancing and bandwagoning behaviors still needs to be clearer.
4	"Include a scoring system that provides feedback on whether player actions align with balancing or bandwagoning behavior. Create visual indicators that show when the system is becoming unbalanced due to excessive bandwagoning."	None.

Table 2: Prompt Path for the Alliance Systems Simulation
Note: Claude 3.5 Haiku used in "formal style", with analysis tool and HTML rendering enabled.

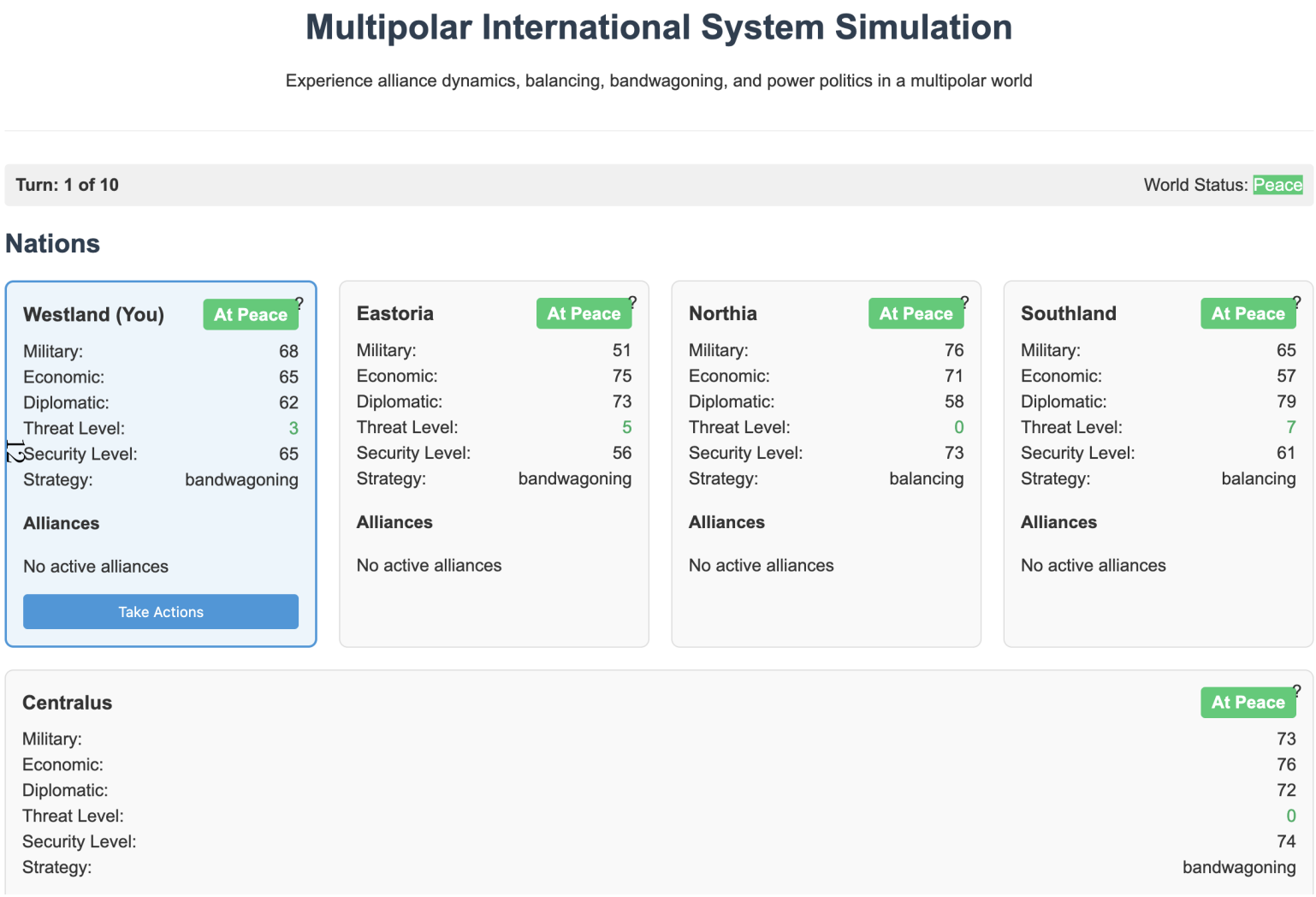


Figure 5: Alliance Simulation Interface

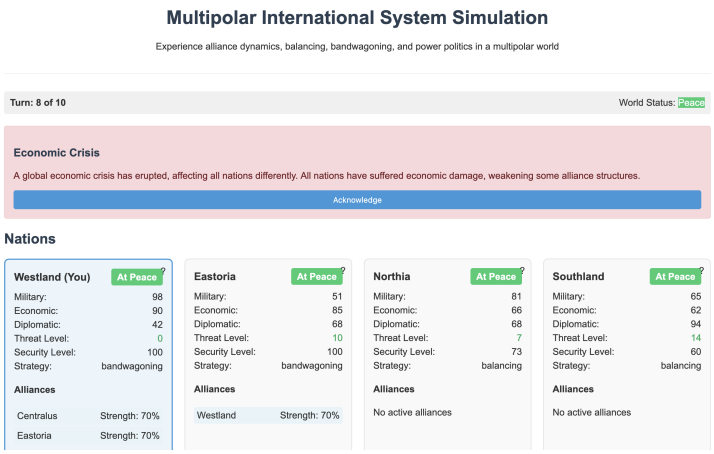


Figure 6: Alliance Simulation Part-Way Results

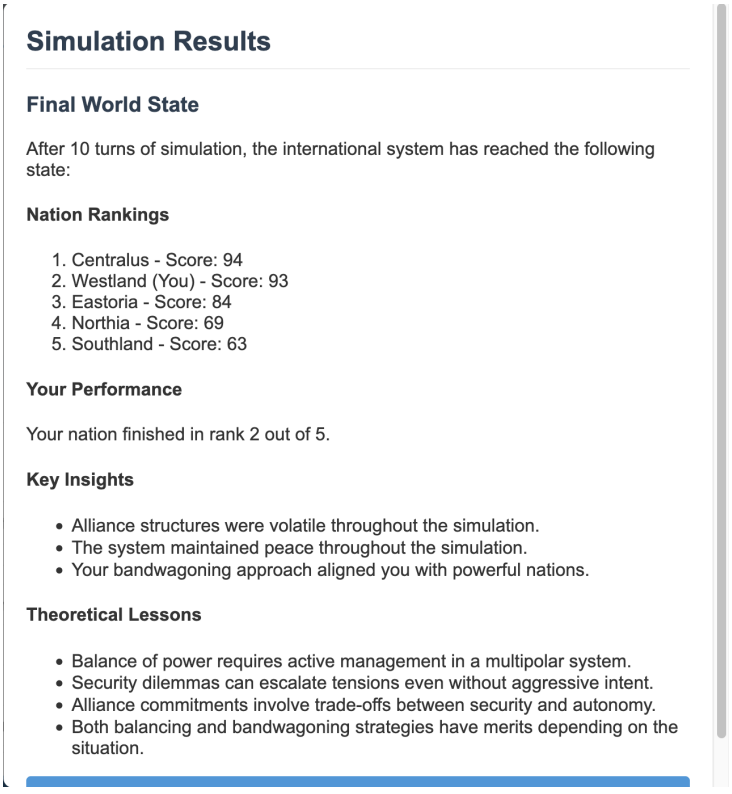


Figure 7: Alliance Simulation Final Results

Example VII: Simulating Leadership Decision-Making in Wartime

In our penultimate example, we use Claude to create a simulation that allows students to experience how individual psychological traits influence decision-making during wartime. Jervis (2017) shows that cognitive biases and personality attributes significantly shape how leaders interpret threats and formulate responses, while Hermann (1980) demonstrated how leadership traits directly affect foreign policy choices. This simulation combines these insights with experiential learning, enabling students to observe how psychological variables might constrain rational decision-making.

In Table 3, we show the prompt iteration for the wartime leadership simulation. Our initial request produced a foundational model with randomized psychological traits, but the decision scenarios lacked historical grounding and sufficient complexity. The second prompt enhanced the simulation with more authentic historical contexts and expanded the range of psychological attributes. In the third prompt, we suggested improvements to the feedback mechanisms to better illustrate potential connections between personality traits and outcomes. Our final prompt added deeper analytical tools and comparative features to encourage reflection on how different leadership styles might produce divergent historical outcomes. A screenshot of the final simulation is shown in Figures 8 and 9. The first figure shows the initial setup at the beginning of the simulation including personality traits and his-

torical context windows. The second shows the specific incident students are responding to as their leader.

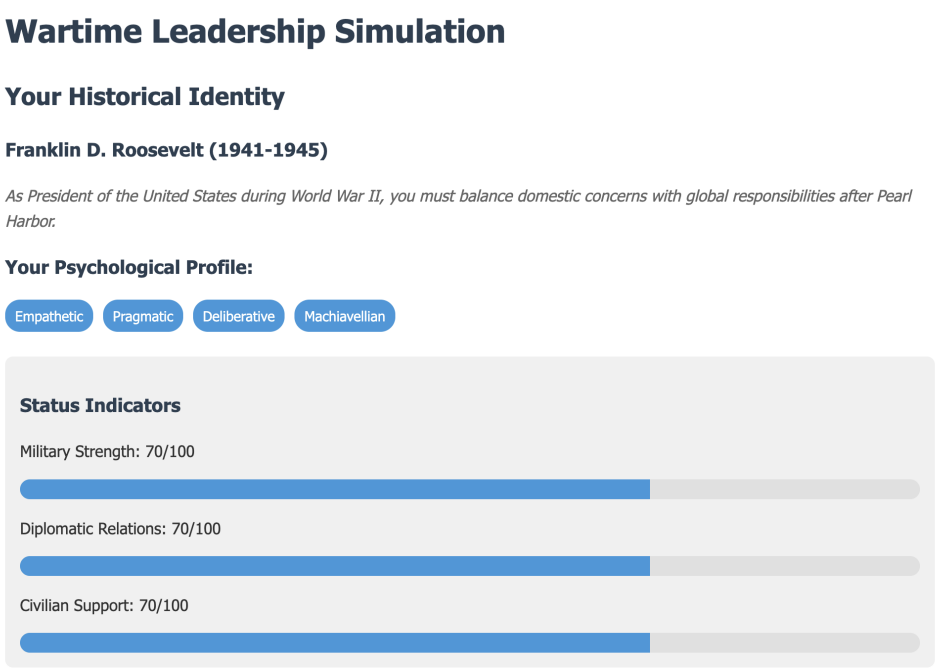


Figure 8: Leadership Simulation Interface

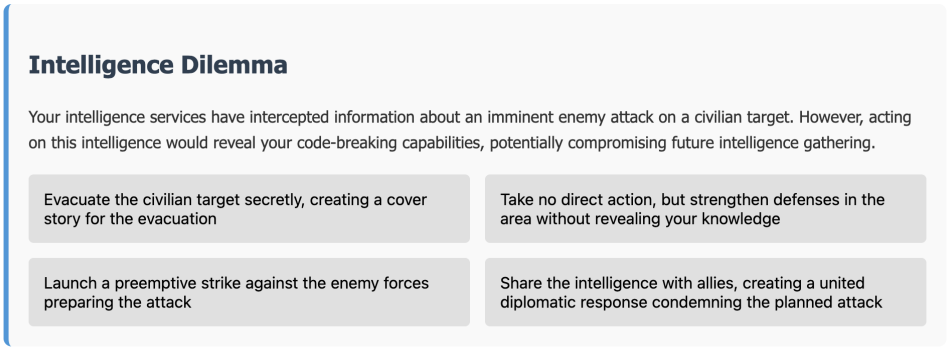


Figure 9: Leadership Simulation Results

Number	Prompt	Remaining Issues
1	"You are an instructor creating an interactive HTML file for a classroom simulation for university undergraduates. Design a role-playing simulation where students embody historical leaders making high-stakes decisions during wartime. Use randomized psychological traits (e.g., risk tolerance, need for approval) to shape their decision-making processes. Include feedback on how personality and biases impact outcomes. Economize on code and prompt length, but the simulation should still be detailed."	Decision scenarios could be more historically informed. Psychological traits need better implementation and connection to historical leaders.
2	"Improve the historical accuracy of the scenarios by incorporating specific wartime dilemmas faced by actual leaders. Expand the psychological trait system to include cognitive biases such as confirmation bias, groupthink tendencies, and prospect theory elements like loss aversion. Reference political psychology literature in the simulation guide."	Feedback mechanisms don't fully illustrate how specific traits influenced outcomes.
3	"Improve the feedback system to provide clearer connections between personality traits and decision outcomes. Implement a narrative-based debriefing that explains how specific psychological attributes shaped the historical trajectory. Add visualization tools that track decision patterns over time."	Limited comparative analysis between different leadership styles. Needs better tools for student reflection.
4	"Add a comparative analysis feature that allows students to see how different psychological profiles might handle the same crisis. Implement journaling prompts throughout the simulation to encourage reflection on decision-making processes. Include an option to compare student decisions with actual historical choices and outcomes."	None.

Table 3: Prompt Path for the Leadership Simulation
Note: Claude 3.5 Haiku used in "formal style", with analysis tool and HTML rendering enabled.

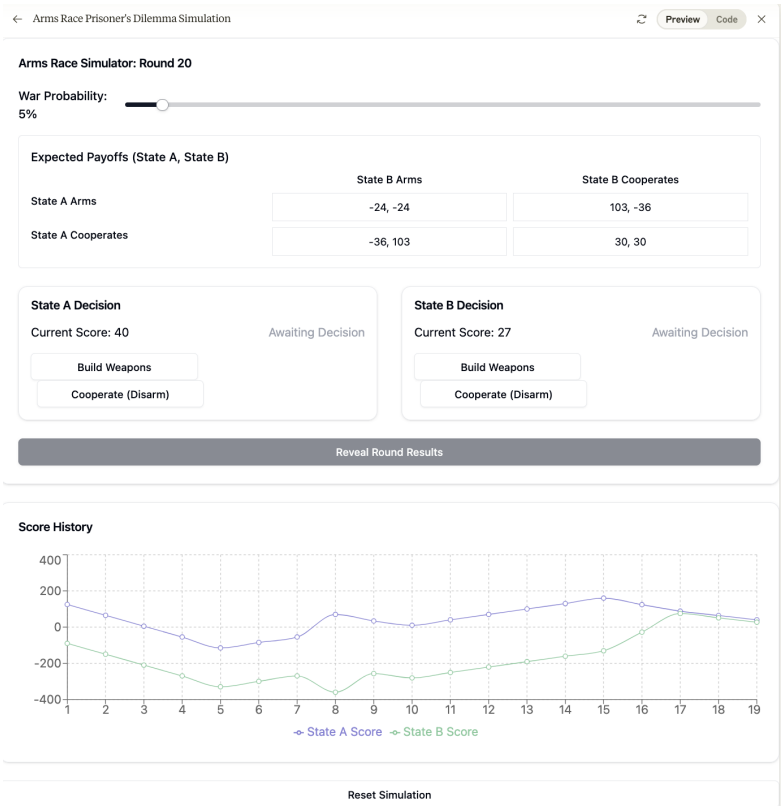
Example VIII: Prisoner's Dilemma in an Arms Race

Our final example synthesizes some concepts from international relations (IR) and shows how simple it is to construct a simulation that can involve more than one student. The purpose of this simulation is to illustrate the dynamics of strategic interactions in an anarchic international system. Table 4 shows the iterative refinement needed to create the simulation we had in mind. The first prompt we used meant to establish the basic structure of the prisoner's dilemma (PD) in the context of an arms race. We include several key terms such as cost of arms and likelihood of war. From the first iteration it was clear that the payoff structure was not communicated clearly enough, so we made sure to include the underlying logic of the PD. We then worked to refine the user interface by prompting Claude to include step-by-step decision processes, implementing probabilistic war outcomes based on variable parameters, and finally incorporating single-player option against the computer. In all, and as the other two illustrations show, starting with a well thought out prompt is a good start, but to get to the intended end product, a few simple iterations of revisions to the original prompt are often necessary.

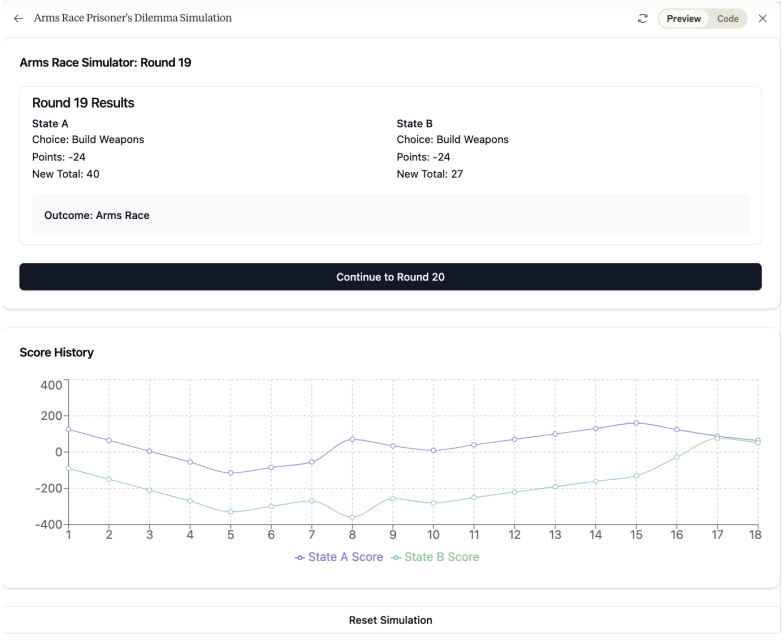
Figure 10a shows the interface for the simulation. The interface gives students control over variables like perceived threat levels and arming costs. In Figure 10b, students then see the outcomes based on their decisions. Both of these panes help to visualize how changes in the parameters influence

Number	Prompt	Issues
1	"You are an instructor creating an interactive HTML file for a classroom simulation for university undergraduates. Create a simulation to model the Prisoner's Dilemma in the context of an arms race. Students represent rival states and must decide whether to build weapons or cooperate to disarm. Include a payoff matrix and options to adjust variables such as the perceived threat, cost of arms, and likelihood of war."	The basic logic is good, but the payoff matrix doesn't accurately reflect the classic Prisoner's Dilemma structure. Also, the UI does not clearly display each state's decision before resolving outcomes.
2	"Ensure the payoff matrix reflects an iterated Prisoner's Dilemma structure, where mutual cooperation is better than mutual defection, but unilateral arming provides the highest short-term benefit. Also, show both states' decisions side by side before calculating outcomes."	Payoff values are closer to PD logic, but decision buttons are placed confusingly. Also, the game does not have a structured step-by-step process.
3	"Rearrange the UI to first collect decisions from both states, then display payoffs before moving to the next round. Label decisions more clearly."	Flow is clearer, but the "likelihood of war" parameter does not properly influence the outcome.
4	"Ensure the likelihood of war parameter probabilistically influences whether arming leads to war, rather than being a fixed outcome. Display war probability alongside expected payoffs."	No ability for single player versus the computer.
5	"Include an option for single player versus the computer in addition to the existing simulation options."	

Table 4: Prompt Path for the Prisoner's Dilemma Simulation
Note: Claude 3.5 Sonnet used in "Normal style", with analysis tool and LaTeX rendering enabled.



(a) Interface



(b) Result

Figure 10: Illustration of the Prisoner's Dilemma

strategic calculations. Specifically, students should learn that individually rational choices can result in collectively suboptimal outcomes. Coupled with a class discussion, instructors could bring in topics about the assumptions of rationality in IR, the security dilemma, and how repeated interactions may be a solution to some of the structural issues that lead to suboptimal outcomes. When we tried this in a classroom setting, most students began with competitive strategies before slowly developing some level of trust and intrinsic desire for cooperation and restraint. Thus, the simulation reinforces theoretical concepts through active engagement rather than passive reception by giving students a hands-on understanding of abstract ideas such as the anarchic international system, relative gains concerns, and the difficulties of making credible commitments.

The instructor can further contextualize these lessons with real-world cases, such as the U.S.-Soviet arms race during the Cold War or the India-Pakistan rivalry (Jervis, 1978; Glaser, 1997). By linking the abstract PD game to concrete historical examples, students gain a deeper understanding of the security dilemma and the difficulty of achieving cooperation in international politics. For assessment, instructors can ask students to write short reflections on their decisions, explaining their rationale in light of IR concepts. Alternatively, students can compare outcomes from the one-shot versus iterated PD games to evaluate the conditions under which cooperation becomes possible (Axelrod and Hamilton, 1981).

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