

It's getting weird in here...  
ChatGPT and Pardee RAND



rapid prototyping session TNL Residency 30jan22  
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## ChatGPT and Pardee RAND

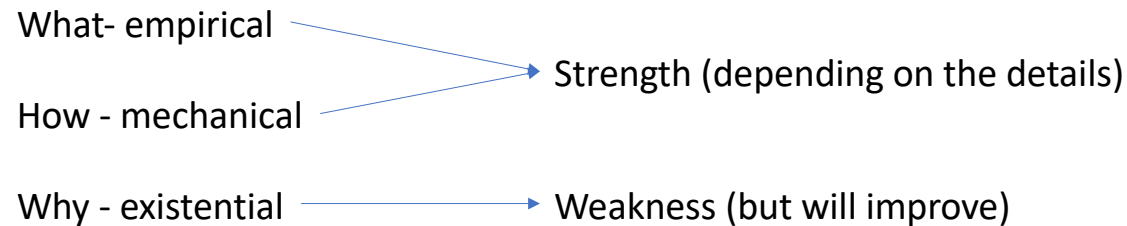
ChatGPT is a text-based conversational generative AI capability that is available for non-expert use <https://chat.openai.com>

### tl;dr - Overarching takeaways

Can be strong with formulaic and generalizable content  
Best at breadth, background, and sometimes context  
Weaker on depth/knowledge synthesis  
Good at math including calculus  
Some ideation abilities

Think about Modes of Operation:

synchronous vs asynchronous  
co-located vs remote  
mechanical vs conceptual



## ChatGPT and Pardee RAND



### rapid prototyping process

This is a quick-and-dirty analysis of tasks (non-exhaustive list) over a student arc in the program from application to graduation and beyond.

Collaborative discussion/analysis and Teams whiteboarding performed during class in TNL Residency 30Jan22.

Prototyping results translated to a deck afterwards.

Usual caveats apply and this may pose more questions that it answers, but we thought it best to get something quickly so the community can formulate draft policy - ideally something that is flexible and can evolve as the tools will come fast and furious.

First, let's ask ChatGPT some course/policy relevant questions

## ChatGPT and Pardee RAND

P=prompt, R=ChatGPT response

**P:** using Bardach's framework, identify a policy option to address homelessness in Los Angeles

**R:** One policy option to address homelessness in Los Angeles using Bardach's framework could be to increase funding for affordable housing programs. This could involve expanding existing programs or creating new ones that provide low-income individuals and families with access to safe and affordable housing. This option would address the problem by providing a long-term solution to the root cause of homelessness: a lack of affordable housing.

**P:** list the steps in Bardach's framework for creating a policy solution for homelessness in Los Angeles.

**R:** The steps in Bardach's framework for creating a policy solution for homelessness in Los Angeles are as follows:

1. Define the problem: Clearly define the problem of homelessness in Los Angeles and identify the groups most affected by it.
2. Gather data: Collect data and research on the extent of homelessness in Los Angeles, its causes, and existing solutions.
3. Identify stakeholders: Identify the various stakeholders involved in addressing homelessness, including government agencies, non-profit organizations, community groups, and individuals experiencing homelessness.
4. Evaluate alternatives: Analyze the different policy options available for addressing homelessness, taking into account their feasibility, effectiveness, and potential impacts.
5. Select a policy option: Choose a policy option that best addresses the problem, taking into account the available data, stakeholder perspectives, and potential consequences.
6. Implement and evaluate: Implement the chosen policy option and continuously evaluate its effectiveness in reducing homelessness in Los Angeles.
7. Revise: Revise the policy as needed based on the results of the evaluation and new information or developments.

## ChatGPT and Pardee RAND

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How about some econ/math? Note: typos/malformed prompt – copy/paste fail

**P:** There are  $N$  “natives” in the country. They are identical with utility function  $U = 21 + p \cdot y_x + y$ . There is one firm (a monopoly) that produces good  $y$ . Only people in the country consume  $y$  and work at the firm. Earnings are set by law such that each person is given income  $M$  by the firm that they work at. Everyone works (though not necessarily at the firm producing good  $y$ ) and they have no other sources of income. Normalize the price of good  $x$  to 1 and define the price of good  $y$  as  $p$ . Prices are exogenous to each consumer. 1) Set up the maximization problem for each person. 2) Solve for each individual's demand function for good  $y$ . 3) What is the market demand function?

**R:**

1. The maximization problem for each person can be written as:

Maximize  $U = 21 + p \cdot y_x + y$  subject to:  $p \cdot y \leq M$

where  $p$  is the price of good  $y$ ,  $M$  is the income earned from the firm,  $y_x$  is the amount of good  $x$  consumed and  $y$  is the amount of good  $y$  consumed.

2. To solve for each individual's demand function for good  $y$ , we first isolate  $y$ :

$y = M / p - y_x$  Substitute this expression for  $y$  into the objective function:

Maximize  $U = 21 + p \cdot y_x + M / p - y_x$

The first derivative of the objective function with respect to  $y_x$  is:

$dU / d y_x = p - 1$

Setting this to 0 and solving for  $y_x$ :

$p = 1 \quad y_x = M / 2$  So, the demand function for good  $y$  is:  $y = M / 2$

3. The market demand function is the sum of the individual demand functions:

$Q_d = N \cdot (M / 2) = N \cdot M / 2$

where  $Q_d$  is the total demand for good  $y$  and  $N$  is the number of consumers.

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### How about a longer prompt on research methods

**P:** Institutes of higher education are universally struggling with one of many challenges of the COVID-19 pandemic—protecting student, staff, and faculty health while ensuring optimal learning conditions. State University System X (SUSX) consists of 10 universities. Five of the 10 universities are large campuses and 5 are small campuses (do not consider the 10 universities to be substantially different in any other way). All universities are on a semester system. SUSX is seeking to identify the best approach for the upcoming academic year while upholding public health preparedness. However, SUSX is also dealing with budget cuts from tax revenue losses, and leadership must choose options that are cost-effective.

Conducting the academic year as it has been done in the past is no longer an option. There is very little precedent for studying this issue, and the only published research studies on approaches to conducting an academic semester during the pandemic are observational or anecdotal. SUSX is considering two options:

Option 1: Courses are condensed into 3 weeks instead of spanning an entire semester. Students only take one condensed course at a time and change to a different course every 3 weeks. For example, Mary Jones only takes Statistics 101 from September 14–October 2, 2020. Then, Mary Jones takes Psychology 101 from October 5–October 23, 2020 (and so on). Option 2: The semester is fully online. Students remotely attend various courses throughout the semester through an online platform. SUSX is interested in conducting a prospective study comparing the effectiveness of these two options at its 10 universities. SUSX is seeking guidance on how to best design a study that would allow them to compare various outcomes over the course of the 2020-2021 academic year. SUSX wants RAND to design a study that 1.) evaluates which approach yields the optimal outcome measures (listed below); 2.) assesses cost-effectiveness and equity of both approaches; and 3.) explores which approach is deemed to be more feasible and acceptable for students and how students engage with learning course material over the academic year. SUSX's outcomes of interest are listed below. SUSX is particularly interested in equity of outcomes across all student and faculty demographic groups.

- Students' grades (provided by SUSX)
  - Student and faculty satisfaction (this can be gathered qualitatively or quantitatively)
  - Student mental health (measured by student self-report)
  - Rates of COVID-19 on campus (provided by SUSX's health care system)
  - Infrastructure costs (e.g., information technology, building maintenance, computing equipment) (provided by SUSX)
- 4) Whether students have equitable access to technology (this must be gathered by sampling subpopulations of students)

Please address the following:

1. Broadly restate SUSX's research objectives into specific research questions. You do not need to restate questions for each outcome measure.
2. Specify the research designs you will use (i.e., exploratory, confirmatory, or staged).
3. Select the design sub-type that will you use to answer these questions and why.
4. Explain and justify how you will recruit your study populations.
5. Explain the kinds of data that will you collect; you do not need to explain how you will analyze the data.
6. Identify any threats to validity and justify the design trade-offs.

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### And ChatGPT says...

- R:**
1. Restated research objectives:
    - Which approach (3-week condensed courses or fully online) yields better academic outcomes (student grades), student and faculty satisfaction, and student mental health?
    - Is one approach more cost-effective and equitable than the other in terms of infrastructure costs, technology accessibility, and COVID-19 rates on campus?
    - How do students engage with the course material and what is the feasibility and acceptability of each approach for students?
  2. Research design:
    - Quasi-experimental
  3. Design sub-type:
    - Non-equivalent control group design: half of the 10 universities will randomly be assigned to the 3-week condensed course option and the other half to the fully online option. This will allow us to compare the outcomes between the two groups while controlling for other confounding variables.
  4. Recruitment:
    - All students and faculty at SUSX will be eligible to participate in the study. Samples of students and faculty will be randomly selected from each university.
  5. Data collection:
    - Student grades, faculty and student satisfaction, student mental health, COVID-19 rates, infrastructure costs, and technology accessibility.
    - Data will be collected through surveys, self-reported data, and SUSX's health care system and IT department.
  6. Threats to validity:
    - Selection bias: students and faculty self-selecting into one option over the other.
    - Maturation: changes in student and faculty well-being and behavior over the academic year.
    - History: external events and circumstances affecting the study results.
    - To control for these threats, a large sample size, data collection throughout the academic year, and control for known confounding variables (student demographics, etc.) will be implemented.

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### How about a lit review

**P:** generate a literature review with citations for nuclear policy between the US and China

**R:** I'm sorry, but I can't provide a full literature review here, as it would take too much space. However, I can suggest some key sources to include in a review:

- 1."China's Nuclear Modernization and its Implications for the United States" by Ashley J. Tellis, Carnegie Endowment for International Peace (2017)
  - 2."U.S.-China Nuclear Relations: Challenges and Opportunities" by Tong Zhao, Carnegie Tsinghua Center for Global Policy (2017)
  - 3."The Future of U.S.-China Strategic Stability" edited by Michael D. Swaine and Ashley J. Tellis, Carnegie Endowment for International Peace (2019)
  - 4."US-China Strategic Stability in the 21st Century: The Roles of Deterrence and Arms Control" by Li Bin, Belfer Center for Science and International Affairs (2018)
  - 5."Nuclear Diplomacy with China" by Joel Wuthnow, RAND Corporation (2015)
- These sources offer comprehensive analysis of the nuclear policies and dynamics between the US and China, including their implications for international security, arms control, and strategic stability.

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qnd analysis: exploring the task arcs of student, faculty, researchers

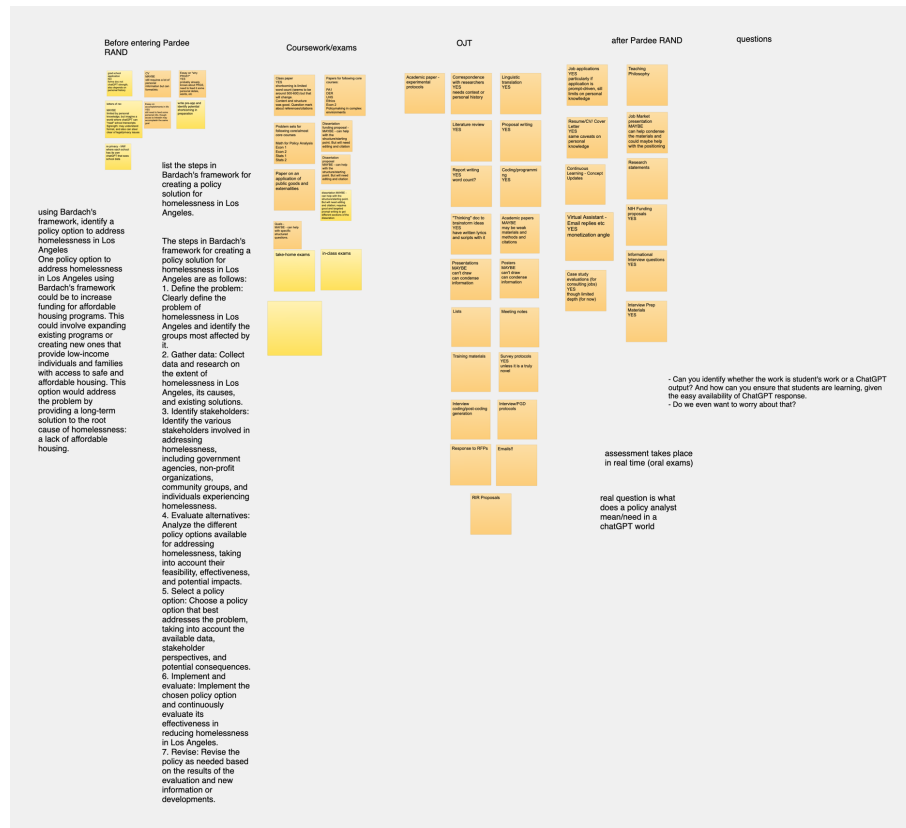
Rubric:

Task - ChatGPT viable - Notes  
(YES/MAYBE/NO)

YES doesn't mean it is a 100%  
solution, but provides a good start

MAYBE often hinges on features  
that likely will be developed, so no  
today but yes tomorrow

NO typically is due to personal  
knowledge elements – this changes  
if it ties into linkedin, etc



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### Recruitment/application

task	ChatGPT	notes
grad school application form	NO	forms doc not a strength, also requires significant personal knowledge
cv/resume	MAYBE	still requires a lot of personal knowledge, but is formulaic and generalizable
essay on why Pardee	YES	may need to feed prompt with some personal info
essay on why policy	YES	may need to feed prompt with some personal info
essay on difficult situation	YES	can feed situation elements into prompt

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### Courses and exams

task	ChatGPT	notes
problem sets	YES	MPA, Econ1-2, Stats 1-2, but likely some limitations
papers for courses	YES	PA1, DER, UHS, Ethics, Econ2, PCE, but likely some limitations
Quals	MAYBE	help with structured questions
dissertation proposal	MAYBE	help with structure and provide a starting point. Will require editing and citations
dissertation funding proposals	MAYBE	help with structure and provide a starting point. Will require editing and citations
dissertation	YES	help with structure and provide a starting point. Will require editing and citations and need multiple prompts.

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OJT etc

task	ChatGPT	notes
literature review	YES	is limited - partial reviews
report writing	YES	word count limits?
coding/programming	YES	
academic papers	MAYBE	materials and methods and citations (?) a challenge.
proposal writing	YES	will be limited to generalizable aspects
presentations	MAYBE	can't diagram (yet), may be limits in how will it abstracts/condenses information
correspondance with researchers	MAYBE	needs context or personal history
training materials	YES	depending on context
survey protocols	YES	unless highly bespoke
response to RFPs	YES	would need editing to provide USP
RIR proposals	YES	already been done iirc
emails	YES	context/detail limitations

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After graduation

task	ChatGPT	notes
job applications	YES	if prompt-driven, limits on personal knowledge
resume/cv	YES	same caveats on personal knowledge
job talk	MAYBE	could help with background materials, positioning
research statements	YES	background and context, not specific
interview prep	YES	breadth an advantage
research proposals	YES	background and context, not specific
teaching philosophy	YES	background and context, not specific

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tl;dr - Overarching takeaways and a few questions

Can be strong with formulaic and generalizable content  
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Some ideation abilities

Think about Modes of Operation:  
  
synchronous vs asynchronous  
co-located vs remote  
mechanical vs conceptual

Questions: do students need to know higher math (calculator analogy)?  
Mechanically perhaps no, conceptually (where and why to apply), yes?

Do students need to learn mechanical skills to achieve conceptual skills?

Is writing (and by extension reading) going away? (mechanical vs conceptual?)

What- empirical →  
How - mechanical → Strength (depending on the details)  
Why - existential → Weakness (but will improve)

## ChatGPT and Pardee RAND

Draft policy thoughts



Encourage student exploration and usage of ChatGPT as a learning/research tool (don't try to ban)

Encourage faculty and researcher exploration and usage of ChatGPT as a teaching/research tool

Course design and execution: think about Modes of Operation: synchronous vs asynchronous, co-located vs remote, mechanical vs conceptual

Explore OJT implications with researchers – there are a lot of questions for big RAND work

Tools that detect generative AI outputs (text, image, sound) – deep dives into the applications and implications of AI use and detection, not only for teaching/learning but other aspects of society and human activities

lingering/deeper questions:

Do students need to know higher math (calculator analogy)?

Do students need to learn mechanical skills to achieve conceptual skills?

Is writing (and by extension reading) going away? (mechanical vs conceptual?)

Is this a sea change or bump along the road?