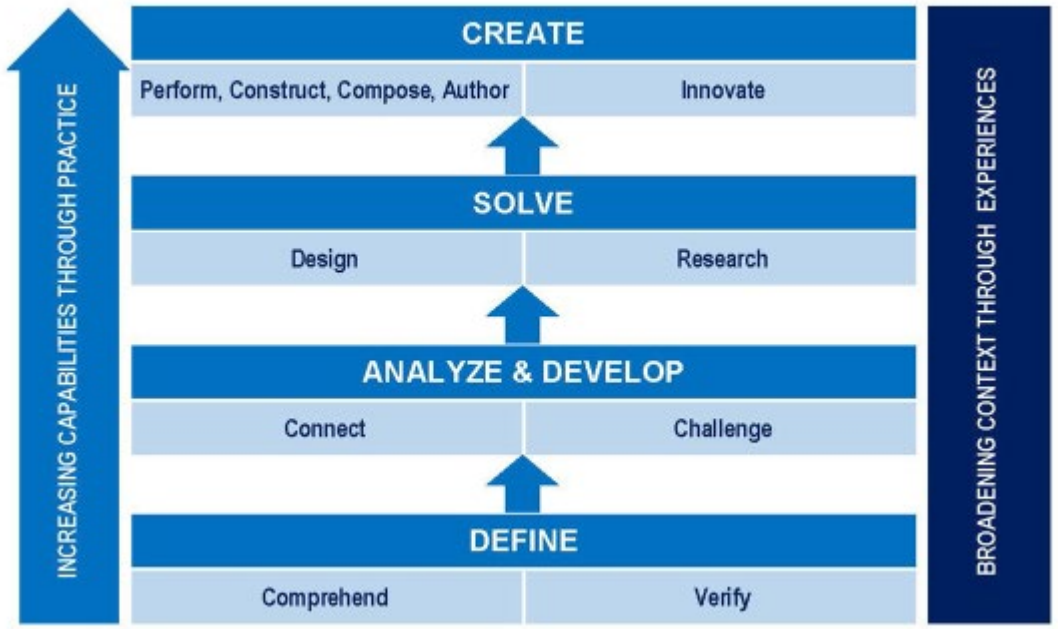
Agenda: (this is a tour, not an immersion!)

- **Fostering Critical Thinking in the AI age**
- **Critical Thinking Assignment Design**
- **AI & Critical Thinking**
  - Prompt engineering as critical thinking
  - Exploring assignment options
- **Q&A applications**
- **MORE!**

RIT's Applied Critical Thinking ladder:



JAZZ:

- Improv method *improves* Improvisation relies on experience/practice!!!
- Experience brings capability

Instructors: what are you assessing/evaluating?

- **Output or capacity gains?**
  - IF AI can answer it, you are measuring OUTPUT!
  - The opportunity/ problem: how to assess capacity…. **In your assignment design**
  - One way: USE critical thinking!

  - **SURE>>>> HOW??? Ask yourself, who is doing the work?**

Define: Information literacy

- **Prompt engineering is an option**
  - It depends upon asking the right question (s) or *prompts* to both get the ‘information’ and *verify* it; you are structuring the prompt to get Gen AI to *comprehend* what you are seeking…..
  - There are MANY types of prompts…. that organize what you ask Gen AI to do!

Basic prompt model: Define a POV and the result, then iterate the result (SCOPE)

- **TAP: Topic, Action, Parameters**

(POV) As an _____ (investigator, writer, researcher),
(ACTION) _____ (write, compose, create)
a _____ (paper, review, map)

THEN WHAT???

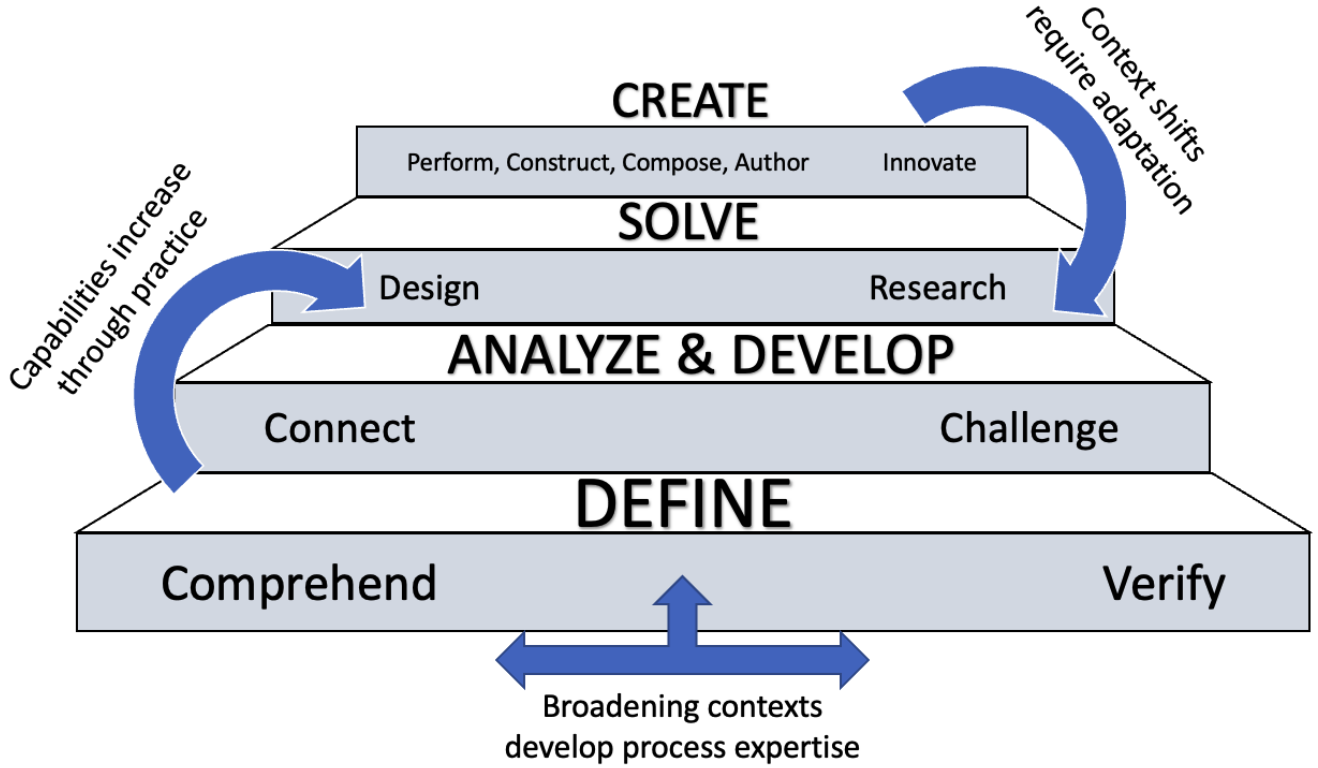
Analyze & Develop: Extras & Refinements (Iterations)

- **Does it make sense? Did it hit the mark? How can my prompt be improved?**
  - Add Audience to the prompt
    - For_____ (university students, the public, customers)
  - Try a refined prompt (ADJUST)
    - Using previous results, …….

Solve

- **Students (and faculty) will see that getting a useful response to the Gen AI research is all about design of *their* interactions (use of the tools), *their* critical thinking, *their* analysis**
- **Faculty can USE that for assessment!**

ACT Pivoting
*another look at critical thinking development



Really?? ---HOW???

- **STEP 1: Determine what CAPACITY you are trying to assess (NOT KNOWLEDGE!)**
- **STEP 2: Structure assignments that acknowledge Gen AI tool use (maybe not required)**
- **FOR example:**
  - What did you ask & why? Explain, show student iterations
  - Assess quality of result (did it solve your problem?, what bias or holes?)
  - How can you ***improve*** on your creation?
- **NOW, it comes down to your rubrics!**

Let's break this down…

This can be done with or without AI

- **Have students report on/ explain/show:**
  - **Validity** of the results (bias, ghost references, plausible)
  - **Accuracy** of the results (does it WORK, seem to make sense, any possible flaws)
  - **Clarity** (evidence, strong argument)
  - **Relevant** (meaning, answers what you need to know)

Assignment examples:

- **As a professor, create a university freshman assignment that teaches critical thinking** https://chat.openai.com/share/02de66d8-7362-48ba-a4e3-c91fe526cec4
  - Title: Analyzing Media Bias: A Critical Examination of News Sources
  - Title: Statistical Analysis of Social Media Engagement

  - Students share/download output and then highlight and discuss your criteria (evaluating the output).

Rubrics??? How do you evaluate the work?

- ***Go back to what capacity gain you are evaluating….***

- ***Using my prompt string…*** Chat gpt AI and ACT prompt example 2024 2 23.docx
  - **As a professor, create a university freshman assignment that teaches critical thinking**
  - **Using the last prompt, make a mathematics based assignment**
  - **Choose three hypotheses related to social media engagement that you would like to investigate. Examples of hypotheses could include: The number of likes on a post is positively correlated with the number of comments. Posts with images/videos receive more engagement than text-only posts. User engagement varies based on the time of day or day of the week.**

Student Learning Outcome: Use Relevant Evidence Gathered Through Accepted Scholarly Methods and Properly Acknowledge Sources of Information					
Criteria	**0**	**Benchmark (1)**	**Milestones (2)**	**(3)**	**Capstone (4)**
Determine the Extent of Information Needed (Scope)	Unable to define the scope of the research question or thesis. Unable to determine key concepts. Types of information (sources) selected do not relate to concepts or answer research question.	Has difficulty defining the scope of the research question or thesis. Has difficulty determining key concepts. Types of information (sources) selected do not relate to concepts or answer research question.	Defines the scope of the research question or thesis incompletely (parts are missing, remains too broad or too narrow, etc.). Can determine key concepts. Types of information (sources) selected partially relate to concepts or answer research question.	Defines the scope of the research question or thesis completely. Can determine key concepts. Types of information (sources) selected relate to concepts or answer research question.	Effectively defines the scope of the research question or thesis. Effectively determines key concepts. Types of information (sources) selected directly relate to concepts or answer research question.
Evaluate Information and its Sources Critically (Context/own and others' assumptions)	Lacks awareness of present assumptions, does not identify contexts when presenting a position.	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.
Use Information Effectively to Accomplish a Specific Purpose (Use of information for purpose)	Unable to communicate information from sources.	Communicates information from sources. The information is fragmented and/or used inappropriately (misquoted, taken out of context, or incorrectly paraphrased, etc.), so the intended purpose is not achieved.	Communicates and organizes information from sources. The information is not yet synthesized, so the intended purpose is not fully achieved.	Communicates, organizes and synthesizes information from sources. Intended purpose is achieved.	Communicates, organizes and synthesizes information from sources to fully achieve a specific purpose, with clarity and depth.
Integrates and Documents Sources	Sources are not integrated and documented.	Sources are rarely integrated and documented.	Sources are integrated and documented some of the time (more than half).	Sources are integrated and documented most of the time (three quarters).	Sources are comprehensively integrated throughout the paper and documented fully.
Variety of Sources Selected Relate Directly to Author's Purpose	The sources selected rarely relate to the author's purpose.	The sources selected relate to the author's purpose some of the time.	The sources selected relate to the author's purpose most of the time.	The sources selected relate to author's purpose throughout the paper.	Variety of Sources Selected Relate Directly to Author's Purpose.

DEFINE:

- Have student assess AI work
- Have student improve AI work
- Especially works for validity

Student Learning Outcome: Analyze or construct arguments considering their premises, assumptions, contexts, conclusions, and anticipating counterarguments					
Criteria	**Insufficient (1)**	**Developing (2)**	**Competent (3)**	**Exemplary (4)**	**Rating**
Identify an Argument	• Does not isolate the argument(s) from extraneous elements in the text • Unable to describe issues, evidence and/or reasoning processes in arguments	• Identifies the argument(s), but includes extraneous elements such as expressions of opinion and descriptions of events • Identifies and describes some of the following: premises, assumptions, contexts, evidence, and conclusions	• Identifies the argument(s) • Identifies and describes most of the following: premises, assumptions, contexts, evidence, and conclusions	• Identifies the argument(s) and clearly distinguishes it from any extraneous expressions of opinion and descriptions of events • Clearly identifies and describes premises, assumptions, contexts, evidence, and conclusions	
Construct an Argument	• Does not clearly develop a premise, conclusion or point of view • No supporting reasoning or evidence is presented	• Develops a premise, conclusion or point of view • Does not organize the evidence or reasons in a logically adequate way	• Develops an argument in which the conclusion is supported by its premises using evidence and logical reasoning	• Develops a persuasive argument in which the conclusion is supported by its premises, using evidence and logical reasoning	
Analyze an Argument	• Does not deconstruct an argument into component parts • Fails to identify constraints and counterarguments • No use of evidence or reason in support of a claim	• Partially deconstructs an argument into component parts • Identifies some constraints or counterarguments • Identifies evidence and reasons in support of a claim	• Deconstructs an argument into component parts • Identifies constraints and counterarguments • Incorporates evidence and reason in support of a claim	• Deconstructs an argument into component parts and assesses the relevance and scope of those parts • Utilizes constraints and counterarguments, as appropriate • Prioritizes evidence and reasons in support of a claim	
Evaluate an Argument	• Unable to assess whether the argument's premises are unacceptable, irrelevant, or insufficient for its conclusion	• Unable to consistently determine validity or strength of an argument • Incomplete assessment of the credibility of the premises, including the quality of evidence	• Assesses whether the argument's conclusion is sufficiently supported by its premises • Assesses the credibility of the premises, including the quality of evidence.	• Identifies and judges between competing mutually valid arguments • Offers an original relevant interpretation based on assessment of argument's premises, assumptions, context, conclusions, and counterarguments	
				Average Rating	

Analyze & Develop:

- Have student assess accuracy of response (does it work? Why or why not?)
- What is missing here?

Student Learning Outcome: Reach sound conclusions based on logical analysis of evidence					
Criteria	**Insufficient (1)**	**Developing (2)**	**Competent (3)**	**Exemplary (4)**	**Rating**
Inquiry	• The question or problem is not clearly identified • Does not identify an appropriate scope of work • Lacks evidence needed to address problem or question and does not identify sources (if relevant)	• The question or problem is partially identified • Partially defines scope of work • Provides some evidence needed to address problem or question, some sources are identified (if relevant)	• Essential elements of the question or problem are identified • Defines the scope of work in terms of requirements or constraints to reaching conclusions (e.g. time, data limitations) • Identifies necessary evidence (including sources, if relevant), to address problem or question	• The question or problem is completely identified and the significance is addressed • Fully defines the scope of work in term of requirements or constraints to reaching conclusions (e.g. time, data limitations), and considers a broader context • Identifies necessary, relevant and/or credible evidence to address problem or question and considers strength or credibility of source(s)	
Analysis and Interpretation	• Evidence is not organized to reveal patterns, similarities, or differences • Evidence is not relevant or appropriate to focus of problem or question • Limited analysis does not address biases or assumptions	• Organizes evidence to reveal some patterns, similarities, or differences • Provides some relevant evidence, but needs further analysis • Acknowledges biases or assumptions	• Organizes and synthesizes evidence to reveal some patterns, similarities, or differences • Evaluates evidence including analysis of some of the following factors: sufficiency, methodology, credibility, relevance, or accuracy • Addresses biases and assumptions, to some degree	• Organizes and synthesizes evidence to reveal insightful patterns, similarities, and differences • Evaluates evidence in depth; including factors such as sufficiency, methodology, credibility, relevance, and accuracy • Thoroughly addresses biases and assumptions in the evidence, including own and others	
Conclusions	• Conclusion is not reached • Conclusion is not justified based on analysis of evidence	• Conclusion is partially justified • Supportive evidence is weak or not directly related to the conclusion	• Conclusion reflects an informed analysis of evidence • Conclusion is justified by connections to supporting evidence • Recognizes some limitations of own analysis	• Conclusion reflects an informed evaluation of evidence • Conclusion is justified by strong supporting evidence • Recognizes the limitations of own analysis and considers other perspectives • Presents implications for larger context or broader significance	
				Overall Rating	

Solve: (First prompt)

- Combo of validity, accuracy, clarity & relevance
- Gets to the composition of the prompt AND result iteration and evaluation

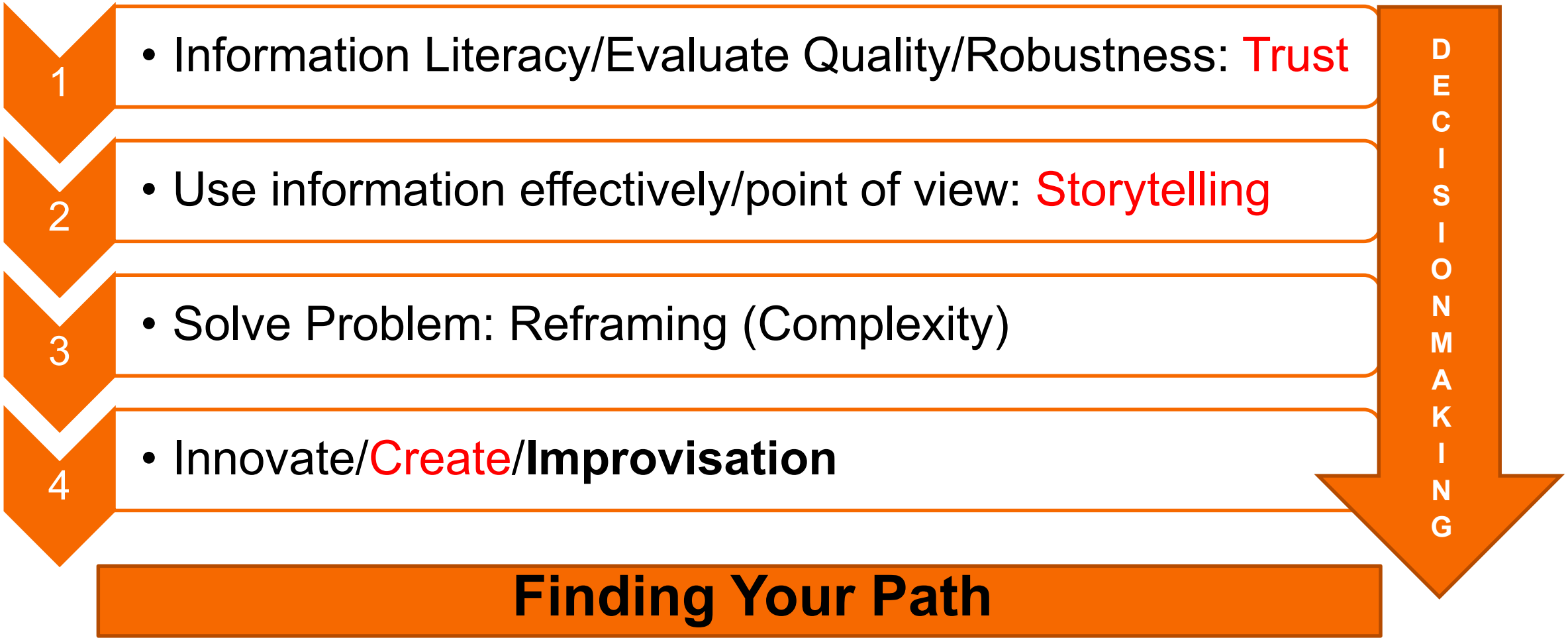
- I did NOT create a great prompt!

Student Learning Outcome: Demonstrate creative or innovative approaches to assignments or projects					
Criteria	**Insufficient (1)**	**Developing (2)**	**Competent (3)**	**Exemplary (4)**	**Rating**
Ideation	• Investigates others' approaches, but does not generate own ideas or approaches • Selects an approach without evaluating the quality of the approach • Does not integrate content knowledge • Does not use feedback or critique to revise approach	• Develops an original approach or an aspect of an approach • Selects an approach without fully evaluating the quality of the approach • Approach reflects some content knowledge, however aspects may be inaccurate, inappropriate, or incomplete • Makes simple revisions to approach based on specific or guided feedback or critique	• Develops multiple original approaches • Evaluates the quality of the approaches within a specific context • Selects an approach based on content knowledge that is accurate • Integrates content knowledge and feedback or critique to make effective revisions to approach	• Develops multiple original approaches, drawing on a wide variety of sources or disciplines • Evaluates the quality of approaches within a specific context • Carefully selects an approach based on knowledge that is accurate and consistent with the assignment or project • Integrates content knowledge and seeks out targeted feedback or critique to make effective revisions to approach	
Creation	• Develops a product, solution, or body of work which is not responsive to needs or requirements of the assignment • A rationale for the approach is not provided	• Develops a product, solution, or body of work and attempts to address some of the needs or requirements of the assignment • A rationale for the approach is provided, but rationale is incomplete or flawed	• Develops a product, solution, or body of work which is responsive to needs or requirements of the assignment and demonstrates some original features • The rationale for the approach demonstrates awareness of historical or theoretical contexts	• Develops a product, solution, or body of work which is responsive to needs or requirements of the assignment • Product, solution, or body of work demonstrates original personal expression • The rationale for the approach is based on an evaluation of ideas and historical or theoretical contexts	
Presentation	• Presents product, solution, or body of work in a manner which is neither original nor engaging • Presentation does not consider the audience, user, or stakeholder	• Presents product, solution, or body of work in a conventional manner • Presentation considers the audience, user, or stakeholder	• Presents product, solution, or body or work in an original manner • Presentation is appropriate for the audience, user, or stakeholder	• Presents product, solution, or body of work in an original and engaging manner • Presentation effectively and connects with the audience, user, or stakeholder • Presenter reflects and evaluates the approach taken	
				Overall Rating	

Create/ Innovate:

- Ideation/ Creation/ Presentation
- OWN ideas (explain given context)
- The story.. Key ideas, not a word salad.

Key measure


1
• Information Literacy/Evaluate Quality/Robustness: Trust
2
• Use information effectively/point of view: Storytelling
3
• Solve Problem: Reframing (Complexity)
4
• Innovate/Create/Improvisation
DECISIONMAKING
Finding Your Path

Questions & Discussion

- **Jennifer Schneider, Fram Chair**

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*Each Rochester college/unit and international campus has a Fram Applied Critical Thinking representative

Great resources: Critical Thinking and AI

- https://medium.com/@amiraryani/8-types-of-prompt-engineering-5322fff77bdf (prompt types)
- https://www.timeshighereducation.com/campus/prompt-engineering-academic-skill-model-effective-chatgpt-interactions?cmp=1 (frameworks)
- RIT Critical Thinking Outcomes & Information:
  - https://www.rit.edu/academicaffairs/outcomes/outcomes-and-rubrics
  - https://www.rit.edu/criticalthinking/overview