

FROM CLASSROOM TO COMMAND: AI LITERACY IN HIGHER ED AND PME

CHLOE WOIDA (CTR)
FEBRUARY 2024



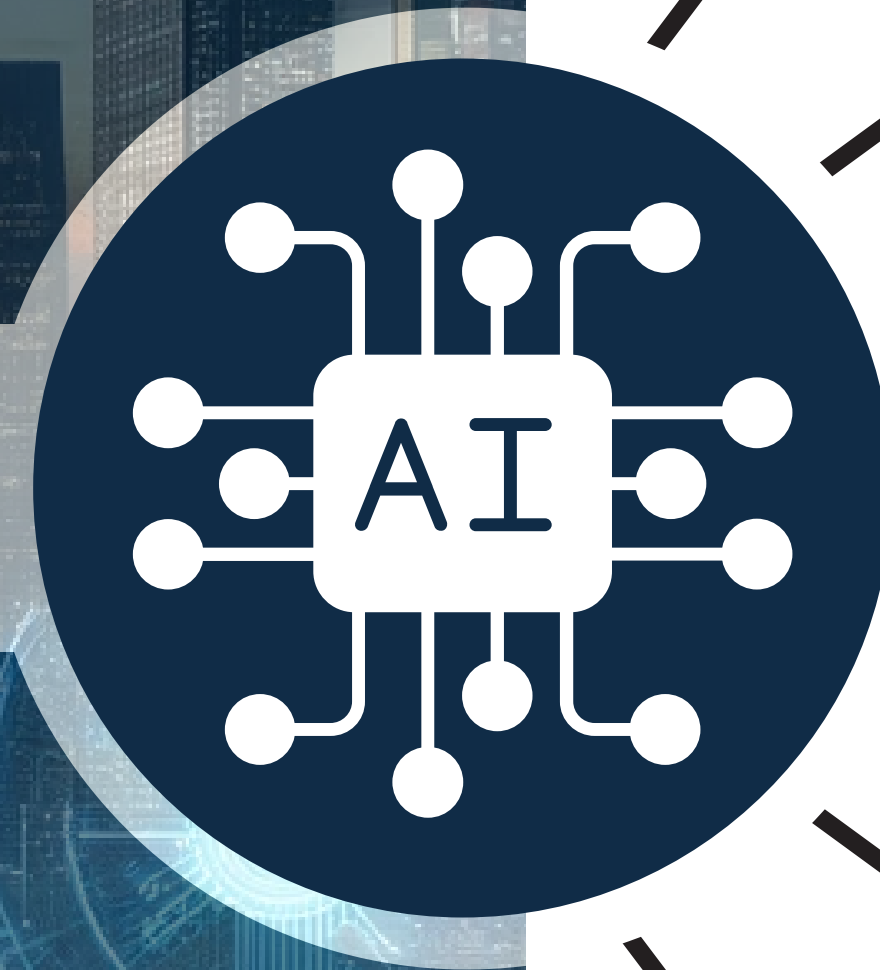
NAVAL POSTGRADUATE SCHOOL



Graduate Writing Center

Images throughout this presentation were generated by DALL·E, an AI program by OpenAI.

Today:



AI Literacy in DOD

AI Literacy in Higher Ed

Reactions to Generative AI

Class Policies and AI Literacy

Activities and Assignments



What opportunities to cultivate AI literacy emerge when we engage with mass-accessible AI technology in military learning environments?



What continuities exist between emerging AI uses and AI uses anticipated in military futures?



What can PME students learn about “big AI” from supported interactions with “little AI”?





AI LITERACY:

“A basic understanding of the **benefits, risks** and **opportunities** of AI and how it impacts daily lives.”

“The baseline knowledge and skills needed to **identify, understand, and interact** with AI responsibly and effectively.”

National Artificial Intelligence Advisory Committee (NAIAC). Recommendations: Enhancing AI Literacy for the United States of America. November 2023. https://ai.gov/wp-content/uploads/2023/12/Recommendations_Enhancing-Artificial-Intelligence-Literacy-for-the-United-States-of-America.pdf

“AI education to date aims to enable people to learn how AI systems work in **technical terms** and it usually involves programming and **building an AI application.**”

Luckin, R., Cukurova, M., Kent, C., & du Boulay, B. (2022). Empowering educators to be AI-ready. *Computers and Education: Artificial Intelligence*, 3, 100076.

“Most of the research on **AI education for non-technical learners** has just been published within the past year.”

Long, D., & Magerko, B. (2020). What is AI Literacy? Competencies and Design Considerations. *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*, 1–16. <https://doi.org/10.1145/3313831.3376727>



No formal or official definition of “AI literacy” in DOD.

From *Developing Today’s Joint Officers for Tomorrow’s Ways of War*
The Joint Chiefs of Staff Vision and Guidance for Professional Military Education & Talent Management (2020):

“**Requisite Joint PME End States.** PME and JPME programs must provide graduates the initial knowledge and skills to prepare them for service as warfighting joint leaders, senior staff officers, and strategists who:

Discern the military dimensions of a challenge affecting national interest, frame the issue at the policy level, and recommend viable military options within the overarching frameworks of globally integrated operations;



Anticipate and lead rapid adaptation and innovation during a dynamic period of acceleration in the rate of change in warfare under the conditions of great power competition and **disruptive technology**;



Conduct joint warfighting, at the operational to strategic levels, as all-domain, globally integrated warfare, including the ability to integrate allied and partner contributions; and



Are **strategically minded** warfighters or applied strategists who can execute and adapt strategy through campaigns and operations. All graduates should possess **critical and creative thinking skills, emotional intelligence, and effective written, verbal, and visual communications skills** to support the development and implementation of strategies and complex operations.”



Priorities for PME have included understanding AI technologies in the context of global competition.

The potential for premature fielding of deadly AI technologies has been a persistent concern.



Users must accurately understand AI and human capabilities respectively in order to appropriately integrate both.



Human-AI teaming and integration of AI tools into existing systems has been a pressing concern, characterized by the need to keep the “human in the loop”

Pentagon’s AI initiatives accelerate hard decisions on lethal autonomous weapons. (2023, November 25). AP News. <https://apnews.com/article/us-military-ai-projects-0773b4937801e7a0573f44b57a9a5942>





Mick Ryan argued in 2018 for “a heightened technological literacy across the entire force.”

“Military personnel will require basic literacy in artificial intelligence, including

knowledge of its application,



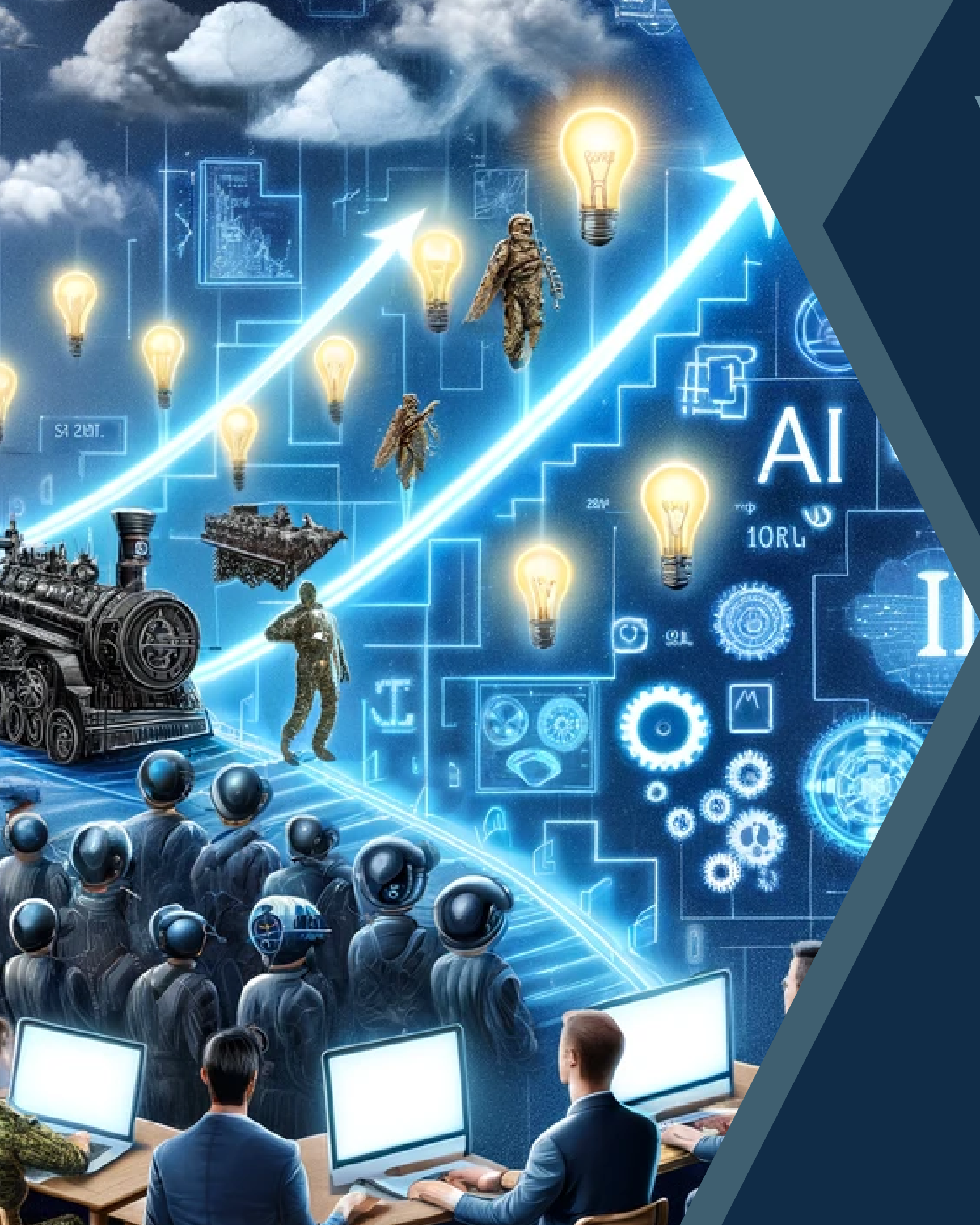
how to provide a level of assurance and quality control, and



how to optimally combine it with human intelligence.”



Intellectual Preparation for Future War: How Artificial Intelligence Will Change Professional Military Education. (2018, July 3). War on the Rocks. <https://warontherocks.com/2018/07/intellectual-preparation-for-future-war-how-artificial-intelligence-will-change-professional-military-education/>



“AI education for end users”

Michael Horowitz and Lauren Kahn (2020) warned that “just as military personnel...in previous generations needed to...learn the basics of electricity and combustion engines ...the same will be true of AI now.”



“Provide leaders with a firm grasp of the basic **underlying principles** of AI”



Help leaders recognize “the **general-purpose character** of AI” as well as AI’s **limitations**



Enable leaders to “better envision **where AI can fit into existing institutions and systems**, and where it would be most useful to integrate or introduce”



Foster awareness “of **the status of AI development in other countries**” including policy, initiatives, and best practices

The AI Literacy Gap Hobbles American Officialdom. (2020, January 14). War on the Rocks. <https://warontherocks.com/2020/01/the-ai-literacy-gap-hobbling-american-officialdom/>

Critical Competencies in AI Literacy

Long, D., & Magerko, B. (2020). What is AI Literacy? Competencies and Design Considerations. Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems, 1–16. <https://doi.org/10.1145/3313831.3376727>

“A set of competencies that enables individuals to **critically evaluate AI technologies; communicate and collaborate effectively with AI; and use AI as a tool online, at home, and in the workplace.**”

WHAT IS AI?

Do students recognize AI when they interact with technology that relies on it?

Are students aware of the range of intelligent machines that exist?

Can students differentiate between narrow and general AI?

Have students critically considered the features of intelligence (whether human, animal, or machine)?

WHAT CAN AI DO?

Have students considered what kinds of problems or tasks AI is good or bad at?

Can they accurately determine when human skills are needed instead?

Have students considered how AI might be applied in the future?

HOW DOES AI WORK?

Do students have a sense of how knowledge about the world might be represented in a form a computer can use?

Do students have a sense of how computers reason and make decisions?

Do students understand the essentials of machine learning?

Are students aware of how humans shape the behavior of AI systems through programming, choosing models, and fine-tuning?

WHAT SHOULD AI DO?

Have students considered key ethical issues surrounding AI? E.g.,

- privacy
- employment
- misinformation
- the singularity
- ethical decision making
- diversity
- bias
- transparency and accountability

Questions informed by Long, D., & Magerko, B. (2020). What is AI Literacy? Competencies and Design Considerations. Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems, 1–16. <https://doi.org/10.1145/3313831.3376727>



2023: DOD Interim Guidance on Generative AI

Task Force Lima was launched in August of 2023 as a part of the Chief Digital and Artificial Intelligence Office's (CDAO) Algorithmic Warfare Directorate. Its purpose is to explore the impacts of generative AI.

The DOD guidance itself is CUI; a CDAO spokesperson shared the following key points with a journalist.



Risk Assessment & Mitigation:

“Rather than enforcing outright bans on Gen AI tools, the DOD urges its components to adopt robust governance processes. This includes documenting the risks associated with specific Gen AI use cases, deciding and justifying the acceptable risks, and planning to mitigate unacceptable risks.”



Input Restrictions:

“Publicly available Gen AI tools should be approached with caution. Entering Classified National Security Information or Controlled Unclassified Information, such as personal or health data, is prohibited. All data, code, text, or media must be approved for public release before being used as input.”



Accountability:

“All DOD personnel are accountable for outcomes and decisions made with Gen AI's assistance. Users are advised to verify and cross-check all outputs from such tools.”



Citation:

“For transparency, appropriate labeling is encouraged for documents created with the aid of Gen AI tools.”

Vincent, B. (2023, November 9). New interim DOD guidance 'delves into the risks' of generative AI. DefenseScoop.<https://defensescoop.com/2023/11/09/new-interim-dod-guidance-delves-into-the-risks-of-generative-ai/>

Continuous Learning, Upskilling, and Reskilling



“86% of [survey] respondents believe that they will need upskilling, but just 14% of frontline employees say they’ve received training.”

Beauchene V., de Bellefonds N., Duranton S., Mills S. (2023, June). AI at Work: What People Are Saying. BCG Global. <https://www.bcg.com/publications/2023/what-people-are-saying-about-ai-at-work>



“Assuming a trajectory of adoption posited by Rogers’s (1962) model of innovation adoption...nearly all business practitioners will to some extent use generative AI to communicate and create content by mid-2024”

Cardon, P., Fleischmann, C., Logemann, M., Heidewald, J., Aritz, J., & Swartz, S. (2023). Competencies Needed by Business Professionals in the AI Age: Character and Communication Lead the Way. *Business and Professional Communication Quarterly*, 23294906231208166.



“Future military institutions will need to possess a system that is built around skilling and rapidly re-skilling their personnel as technology and strategic circumstances change.”

Ryan, M. (2020). The Intellectual Edge: A Competitive Advantage for Future War and Strategic Competition. *Joint Force Quarterly*, 96.



Without AI literacy, leaders may:

- ***Avoid and discourage using AI or embrace it precipitously.***
- ***Fail to anticipate or recognize use of AI by those they command.***
- ***Assume AI systems are more capable or less capable than they actually are.***
- ***Overestimate the accuracy and reliability of AI output and fail to verify output.***
- ***Improperly integrate human and non-human contributions to tasks and processes.***
- ***Plan poorly for how AI could or should be integrated or applied in the future.***
- ***Underestimate or ignore risks associated with use of AI and have no mitigation plans.***
- ***Fail to consider ethical concerns about AI, including those related to privacy, bias, information security, and decision-making.***
- ***Fail to disclose or otherwise be appropriately transparent about AI use.***

AI literacy is **supported** when students:

Are **exposed to AI tools** and have opportunities for experiential learning with AI.

Use AI tools critically and deliberately, describing and **differentiating use cases.**

Think about and practice **risk assessment and mitigation** related to AI use.

Critically assess the **quality of AI output** and AI performance and compare it to human performance.

Speculate about the **factors shaping AI behavior** and output (e.g., training data, machine learning, programming).

Plan and assess the **integration of AI support into complex processes** at various points.

Consider the balance of **human and AI contributions** to a task and/or process.

Imagine **future use of AI** and its impact on society and security.

Practice techniques of transparency and citation around their use of AI.

Develop information skills/resource awareness to **verify or cross-check AI output.**

Learn about and discuss key **ethical issues** surrounding AI.

Compare experience of tasks and processes completed **with and without AI support.**

AI POLICY

ARTIFICIAL
ETHICAL USE

ACADEMIC
INTEGRITY

RESPONSIBLE
INNOVATION

AI BIAS



WHAT'S MY **POLICY** ON GEN AI IN THIS CLASS?

Is it technically possible for students to work on my assignments using gen AI tools?

Yes

No

Is that ok with me?

CLOSED

No; it's too damaging to my learning goals.

RESTRICTED

Maybe, but only in specific ways and when I explicitly tell them to.

CONDITIONAL

Yes, as long as they do or don't do certain things.

OPEN

Yes, they're welcome to use the tools as they see fit.

Content adapted from "GenAI Policy and Practice," Gettysburg.edu. <https://www.gettysburg.edu/offices/johnson-center-for-creative-teaching-and-learning/genai/genai-policy-practice>

Design adapted from "Generative AI Decision Pathways," Barnard Center for Engaged Pedagogy. <https://cep.barnard.edu/generative-ai-decision-pathways>

SPECTRUM OF POLICIES ABOUT GEN AI USE

CLOSED

No use of AI on any assignments.

RESTRICTED

Faculty specifies **when** AI may be used--only some assignments.

Faculty specifies **how** AI may be used--only certain use types.

CONDITIONAL

Use of AI is permitted, but **only if certain conditions are met.**

Examples:

Students may use AI if they avoid certain types of use.

Students may use AI if but they must submit plans for use, disclosures, and/or reflections about use.

OPEN

Students may use AI tools freely: no questions asked.

SPECTRUM OF POLICIES ABOUT GEN AI USE

CLOSED

No use of AI on any assignments.

Least supportive for AI literacy

RESTRICTED

Faculty specifies **when** AI may be used--only some assignments.

Faculty specifies **how** AI may be used--only certain use types.

CONDITIONAL

Use of AI is permitted, but **only if certain conditions are met.**

Examples:

Students may use AI if they avoid certain types of use.

Students may use AI if but they must submit plans for use, disclosures, and/or reflections about use.

OPEN

Students may use AI tools freely: no questions asked.

Second worst for AI literacy

Most opportunities to foster AI literacy



When might a **closed** policy help AI literacy?

Limiting AI use to some assignments may have benefits.

Students need to develop baseline skills in order to compare AI performance to human performance.



Allowing students to use AI on some assignments but not others may help them become more aware of how and when they use AI as a tool.



A balance of assignment types may better reveal student abilities and writing voice, which can help faculty intervene to correct overuse or misuse.





COIBORE
PRESDBENET

Conditional Use: Assignments



Use Plan and Risk Assessment

Students can use AI to support scaffolded assignments like research papers, but they must submit a plan for AI use that includes and assessment of possible risk associated with use types and plans to mitigate each risk.



Disclosure Statement or Checklist

For any assignment that students use AI to support, they include a disclosure or acknowledgement statement. Alternately they fill out and submit a checklist that itemizes use types.



Reflection on Use

After completing and submitting an assignment for which AI was used, students complete and submit a reflection on their experience of completing the project including observations about their use of AI

A plan for AI use including risk assessment and mitigation

Risk evaluations are aligned with DOD's developing direction on generative AI use.

As its simplest:



How will you use AI to help you with this project?



What risks can you anticipate? (e.g., inaccurate AI output, impact on learning, academic integrity violations)



How will you mitigate those risks? (e.g., verify all AI-provided information, avoid overuse, consult Graduate Writing Center)



A disclosure of AI use (*aka* acknowledgement, disclaimer, citation)

WHAT
TOOL DID
YOU USE?

Specify what AI or AI-enabled tools were used.

WHY
DID YOU
USE IT?

Identify the reason you used an AI or AI-enabled tool.

HOW
DID YOU
USE IT?

Provide some info about how you used the tool.

example 1:

Elsevier, a large academic publishing company, offers the following guidance to prospective authors in their FAQ:

“We ask authors who have used AI or AI-assisted tools to **insert a statement at the end of their manuscript immediately above the references or bibliography** entitled ‘Declaration of AI and AI-assisted technologies in the writing process’. In that statement, we ask authors to specify the tool that was used and the reason for using the tool.”

“We suggest that authors follow this **format** when preparing their statement:

During the preparation of this work the author(s) used [NAME TOOL / SERVICE] in order to [REASON]. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.”

example 2:

Monash University, an Australian research university, offers the following guidance:

“When you have adapted material generated by artificial intelligence. . .you should add a declaration which:

- Provides a written acknowledgment of the use of generative artificial intelligence
- Specifies which technology was used
- Includes explicit descriptions of how the information was generated
- Identifies the prompts used
- Explains how the output was used in your work.”

“A suggested format:

I acknowledge the use of [insert AI system(s) and link] to [specific use of generative artificial intelligence]. The prompts used include [list of prompts]. The output from these prompts was used to [explain use].“

Disclosures

WHAT
TOOL DID
YOU USE?

Specify what AI or AI-enabled tools were used.

WHY
DID YOU
USE IT?

Identify the reason you used an AI or AI-enabled tool.

HOW
DID YOU
USE IT?

Provide some info about how you used the tool.



A reflection element to support metacognition

Asking students to reflect on the completion of assignments helps them develop their understanding of their own learning process. It also forces them to think critically about the role of AI in their work.

Questions to try:

Describe and reflect on the process of using AI during the project. What worked? What didn't?



How did you resolve problems introduced by AI?



How did you ensure the final product was your own?



What would you do differently next time?





“In the Classroom”



Generate and critically assess AI output as a group



Use AI to introduce randomness



Incorporate AI themes into class discussions



Model and teach behaviors and practices

Generate and critically assess AI output



Assess the accuracy and appropriateness of AI-generated text on a concept or event.



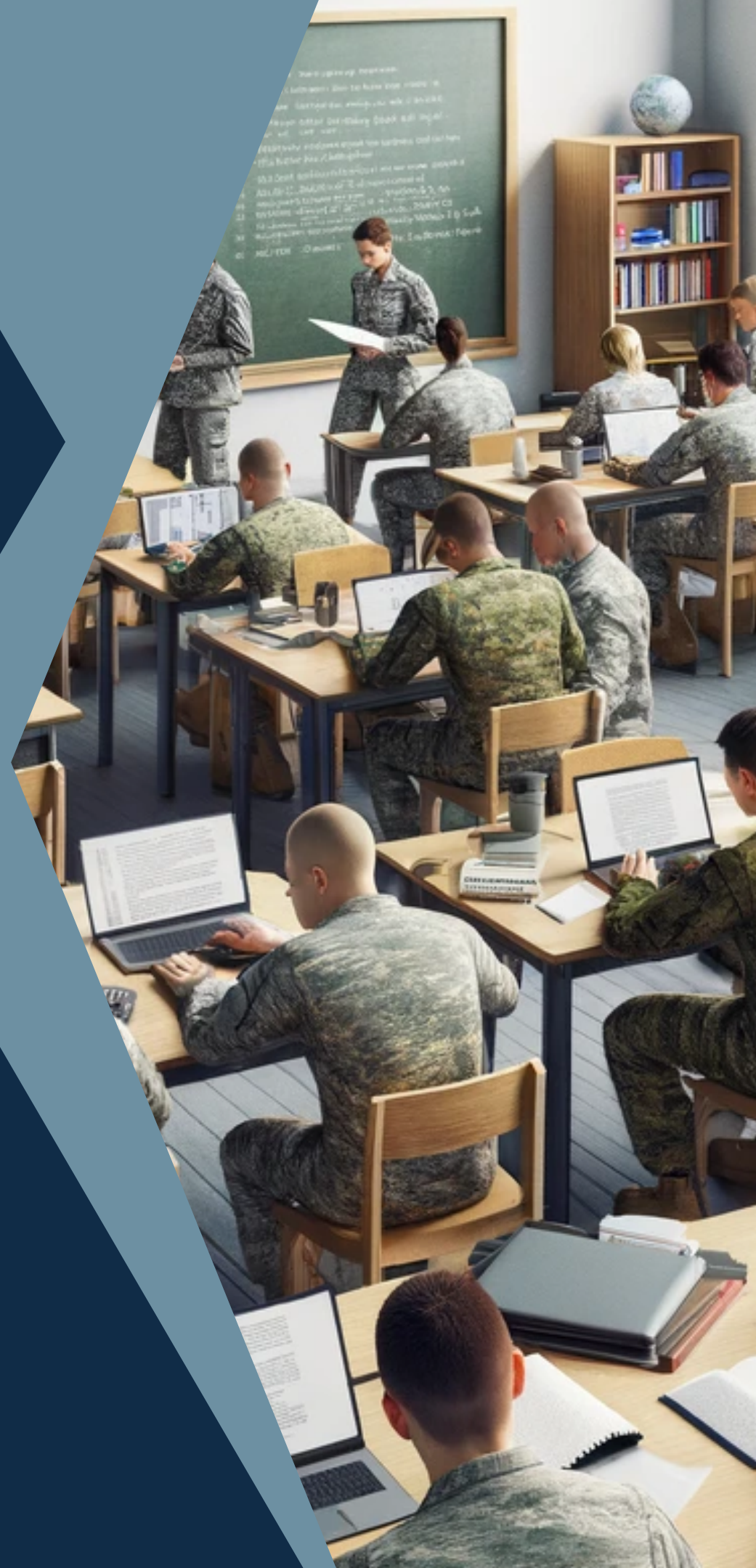
Assess the AI's application of a framework to a scenario



Identify the risks if the AI output were used as the basis of operational or strategic decision making.



Identify the risks if the AI output were deployed without human quality assurance. What is the role of the human in the loop?





Use AI to introduce random or novel elements into activities

Ask AI to generate completely novel and complex scenarios which students use to apply concepts or models.



Ask AI to generate a list of stakeholders with different interests in an issue. Assign these stakeholders to individuals or groups to shape their participation in a debate or discussion.



Reflect together on (a) the strengths and limitations of the output (b) the possible reasons for the nature of the output (i.e., how the model was trained)



Discussions topics: How AI intersects with course focus



How does AI technology relate to core topics in this subject?



How does the field or discipline grapple with issues related to AI?



Are there ethical issues related to AI that are relevant to the course focus?



Model and demonstrate behaviors and skills related to AI literacy



Question the accuracy and quality of AI output



Fact-check and verify information using research and information skills and techniques



Identify and observe where AI falls short and where it shows promise



Speculate about how AI may be used in the future, by allies, or by adversaries

AI literacy is **supported** when students:

Are **exposed to AI tools** and have opportunities for experiential learning with AI.

Use AI tools critically and deliberately, describing and **differentiating use cases.**

Think about and practice **risk assessment and mitigation** related to AI use.

Critically assess the **quality of AI output** and AI performance and compare it to human performance.

Speculate about the **factors shaping AI behavior** and output (e.g., training data, machine learning, programming).

Plan and assess the **integration of AI support into complex processes** at various points.

Consider the balance of **human and AI contributions** to a task and/or process.

Imagine **future use of AI** and its impact on society and security.

Practice techniques of transparency and citation around their use of AI.

Develop information skills/resource awareness to **verify or cross-check AI output.**

Learn about and discuss key **ethical issues** surrounding AI.

Compare experience of tasks and processes completed **with and without AI support.**

THANK YOU! questions?

CHLOE WOIDA (CTR)
FEBRUARY 2024



NAVAL POSTGRADUATE SCHOOL



Graduate Writing Center



WHAT IS AI?

Competency 1: Recognizing AI

Distinguishes between technological artifacts that use and do not use AI.

Competency 2: Understanding Intelligence

Critically analyze and discuss features that make an entity 'intelligent', including discussing differences between human, animal, and machine intelligence.

Competency 3: Interdisciplinarity

Recognize that there are many ways to think about and develop 'intelligent' machines. Identify a variety of technologies that use AI, including technology spanning cognitive systems, robotics, and ML.

Competency 4: General vs. Narrow

Distinguish between general and narrow AI.

WHAT CAN AI DO?

Competency 5: AI's Strengths & Weaknesses

Identify problem types that AI excels at and problems that are more challenging for AI. Use this information to determine when it is appropriate to use AI and when to leverage human skills.

Competency 6: Imagine Future AI

Imagine possible future applications of AI and consider the effects of such applications on the world.

HOW DOES AI WORK?

Competency 7: Representations

Understand what a knowledge representation is and describe some examples of knowledge representations... Knowledge representations model the world in a way that is understandable to a computer.

Competency 8: Decision-Making

Recognize and describe examples of how computers reason and make decisions.

Competency 9: ML Steps

Understand the steps involved in machine learning and the practices and challenges that each step entails.

HOW DOES AI WORK? CONT

Competency 10: Human Role in AI

Recognize that humans play an important role in programming, choosing models, and fine-tuning AI systems.

Competency 11: Data Literacy

Understand basic data literacy concepts...

Competency 12: Learning from Data

Recognize that computers often learn from data (including one's own data).

Competency 13: Critically Interpreting Data

Understand that data cannot be taken at face-value and requires interpretation. Describe how the training examples provided in an initial dataset can affect the results of an algorithm.

Competency 14: Action & Reaction

Understand that some AI systems have the ability to physically act on the world. This action can be directed by higher-level reasoning (e.g. walking along a planned path) or it can be reactive (e.g. jumping backwards to avoid a sensed obstacle).

Competency 15: Sensors

Understand what sensors are, recognize that computers perceive the world using sensors, and identify sensors on a variety of devices. Recognize that different sensors support different types of representation and reasoning about the world.

WHAT SHOULD AI DO?

Competency 16: Ethics

Identify and describe different perspectives on the key ethical issues surrounding AI (i.e. privacy, employment, misinformation, the singularity, ethical decision making, diversity, bias, transparency, accountability).

HOW TO PEOPLE PERCEIVE AI?

Competency 17: Programmability

Understand that agents are programmable.

Long, D., & Magerko, B. (2020). What is AI Literacy? Competencies and Design Considerations. Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems, 1-16.
<https://doi.org/10.1145/3313831.3376727>