



EMPIRE STATE
UNIVERSITY

Integrating GenAI into Graduate level Cybersecurity courses:

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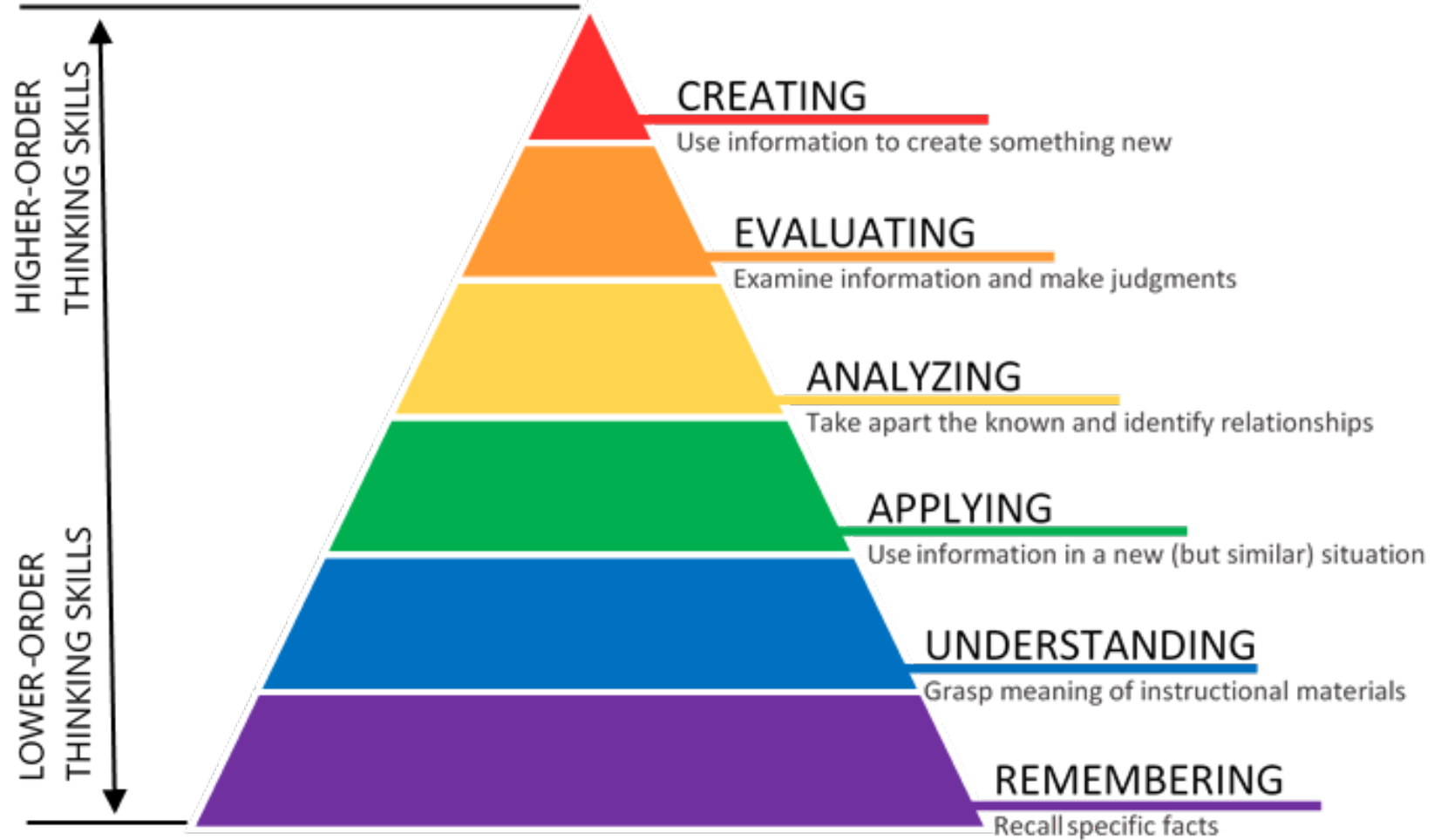
Discussion

GenAI continues to influence the Educational world

- Learners are using it to do their work
- Educators are using it to create assignments
- Educators are spending enormous amounts of time trying to determine if their students are using GenAI
- College and Universities are trying to figure out how to ethically and responsibly include GenAI into their curriculums



BLOOM'S TAXONOMY – COGNITIVE DOMAIN (2001)





What if?

- What if we embraced GenAI and flipped the classroom?
- What if we used GenAI to produce content that we know was incorrect?
 - Then ask the learners to fact find it?
- What do we hope to accomplish?



Looking at Blooms in an AI way

- Consider looking at Blooms Taxonomy in a way that embraces AI and changes the action verbs of the learning outcomes.
- Dr Philippa Hardman research is just that. Her research restructures the Blooms taxonomy to incorporate GenAI.
- Hardman, P. (2023, October 3rd). The DOMS™ A Post-AI Learning Taxonomy. Dr Phil's Newsletter, Powered by DOMS™ AI. <https://drphilppahardman.substack.com/p/a-post-ai-learning-taxonomy>
- Hardman, P. (2023b, April 7). The DOMS™ AI-Ed Tools Evaluation Rubric. Dr Phil's Newsletter, Powered by DOMS™ AI. <https://drphilppahardman.substack.com/p/the-doms-ai-ed-tools-evaluation-rubric>



A POST-AI LEARNING TAXONOMY



Dr Philippa Hardman
LinkedIn Top Voice, AI + Education

1	ANALYSE	Ability to critically analyse information, including AI outputs, by identifying sources, biases, errors etc.	Validate, test, check, assess, measure.
2	UNDERSTAND	Ability to understand key concepts, in part by guiding AI to produce reliable & accurate explanations, descriptions & visualisations.	Compare, discuss, explain, summarise, illustrate.
3	APPLY	Ability to apply concepts in practical scenarios, including the completion of AI conversations, simulations etc.	Practice, implement, execute, demonstrate, solve, simulate, model.
4	CREATE	Ability to use a range of tools, including AI, to develop innovative & original ways to solve problems & exploit new opportunities.	Build, design, create, generate, formulate.
5	COLLABORATE	Ability to partner & communicate effectively with others, including AI, to achieve high quality outcomes.	Interact, partner, co-create, delegate, manage, collaborate.
6	DISRUPT	Ability to innovate radically, using AI to inspire new inventions, disrupt established systems & generate new solutions to wicked, complex problems.	Reimagine, invent, disrupt, rethink, extend, transform, innovate.



The Classroom Experiment

- Asynchronous online Global Cybersecurity course
 - Discussion boards were monitored for each case study
- Developed 4 case studies
 - Case Study #1 – The UK
 - Case Study #2 – China
 - Case Study #3 – Advances Persistent Threats
 - Case Study #4 – Ontology of the USA cybersecurity posture as it relates to foreign policies
 - Final project – Case study on NATO



Case Study #1



Under pressure to provide current and accurate information to policymakers who are not cybersecurity specialists, a member of your cybersecurity team provided the following prompt to ChatGPT 3.5, a publicly available generative AI tool:

United Kingdom

Familiarize yourself and your reader with the history of cybersecurity, current practices and laws, and any recent cyber events that might have happened to or been carried out by the United Kingdom, including their current cybersecurity posture. Then pick one of the reported cyber-incidents against the United Kingdom; describe how the situation developed and how the United Kingdom responded.

Please write and submit a case study that outlines the following:

- 1) Analysis of cybersecurity posture
 - a. Describe the history of cybersecurity as it pertains to the nation-state
 - b. Describe who makes decisions concerning Cybersecurity for the nation-state
- 2) Existing laws or regulations
 - a. Identify and detail the laws and regulations that the nation-state uses for its governmental role in Cybersecurity
- 3) Current events
 - a. Give a brief overview at least two (2) articles, not supplied in this module that outline cybersecurity issues for the nation-state
 - b. Detail the cost and revenue that the nation-state spends on cybersecurity yearly
- 4) Discussion
 - a. Describe one incident that either happened to or was performed by the nation-state
 - b. Summarize what you have found and your opinions on the established cybersecurity practices for the nation.



Case Study #1 cont.

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Case Study #1 cont.

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Case Study #1 cont.

Since the disclosure of sensitive information outside your organization's network could be considered a security incident that would need to be reported to your security clearance oversight agency, the prompt content was reviewed by the Director of Security. The prompt was determined not to be itself sensitive nor was the fact that your organization had an interest in the United Kingdom's cyber posture considered sensitive. Your team member, and you, have been



Case Study #1 cont.

warned in future either to use only on-premises AI tools or to have such prompts reviewed before being submitted to an off-premises AI tool. Also, to properly disclose the use of generative AI in the content creation process.

The AI's response is given below, but has not yet been checked for accuracy or style.

As a cybersecurity specialist, your challenge is to ensure that only verifiable, accurate information is presented to policymakers. To do so, you must:

- verify the information contained, correcting any errors;
- verify and provide accurate references for any referenced sources;
- replace any unverifiable sources and provide accurate references for those;
- add suggestions for additional content that in your expert opinion is important for policymakers to be aware of;
- properly disclose the use of generative AI in the preparation of this white paper; and
- add a discussion of the limitations of using ChatGPT to prepare this paper.



Interesting discoveries

- Case Study #1 – Only one Rubric, Built in AI concepts and fact finding
- Case Study #2 – Learners were given the prompt and given a choice, to use GenAI or to do the case study without GenAI. Rubrics were given for each option.
- Case Study #3 – Only one Rubric, Built in AI concepts and fact finding
- Case Study #4 – Learners were given the prompt and given a choice, to use GenAI or to do the case study without GenAI. Rubrics were given for each option.
- Final Project – Only one rubric with no GenAI used.



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Thank you!

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