

A Three-Dimensional Framework for Geospatial Intelligence Capability Development

Every GEOINT program claims decision advantage. Almost none teach it...

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INTRODUCTION

The Problem:

GEOINT education has no common language for capability development. Programs define what to teach, not how thinking grows. Competency models are linear; GEOINT roles are not. Decision advantage gets mentioned; it rarely gets taught.

Research Question:

How do we build a shared framework for evaluating and developing GEOINT capability across every professional role?

Hypothesis:

A three-dimensional capability framework will more accurately evaluate and map GEOINT professional development than existing linear models — and will reveal where current programs fall short.

METHODOLOGIES

Framework Development

Built from a systematic review of GEOINT education literature and workforce models, then grounded in Jo & Bednarz's spatial thinking taxonomy:

1. Concept
2. Representation
3. Reasoning

That taxonomy was extended from classroom use into a professional capability space and refined across three dimensions through expert consultation and piloted against the USGIF certificate curriculum at the US Air Force Academy.

Analytic Complexity

Predictive / Anticipatory— *What will happen next? Forecasting, modeling change.*

Relational / Patterned— *How are things connected? Patterns, networks, associations.*

Descriptive— *What is here? Identifying, locating, characterizing*

The Consumer

Decision Advantage — *Enabling better decisions; faster & spatially grounded*

Data Exploitation — *Extracting useful information from raw data*

Analytic Judgment — *Apply knowledge to assess meaning & draw conclusions*

RESULTS

BY THE NUMBERS

- 3 dimensions of GEOINT capability
- 27 distinct capability contexts
- 2 development pathways: Practitioner and Consumer
- 1 shared framework applicable across academia, government, and industry

Every GEOINT role occupies a region of the cube The framework doesn't prescribe where you should be. It shows you where you are.

ASSESSING YOUR PROGRAM

Step 1 — Inventory. List every course, module, or learning objective in your program.

Step 2 — Map. Place each item on the cube. Which axis level does it target? Analytic Complexity? Representational Engagement? Decision Support Level?

Step 3 — Read the gaps. Where does your curriculum cluster? Most programs concentrate in Manipulate × Descriptive × Data Exploitation — the foundational corner. What regions go untouched?

Step 4 — Define your audience. Practitioners, Consumers, or both?

The Practitioner

Design — *Creating new representations that communicate and support decisions*

Manipulate — *Adjusting, layering, filtering, and interacting to extract meaning*

Consume — *Reading & interpreting existing information (maps, charts, imagery)*

CONCLUSION

What this framework does: Gives educators, program managers, and workforce developers a common tool to map capability, find gaps, and redesign deliberately across academia, government, and industry.
Why it matters now: GeoAI is automating lower-order tasks. That makes Design, Decision Advantage, and Predictive reasoning more critical. This framework shows you exactly where those capabilities are being developed... and where they aren't.

Limitations: The cube is still conceptual. There has been limited empirical testing to date. That's the next step.

What's Next? Cross-institutional curriculum mapping · Learner self-assessment instrument · Empirical validation