An Integrated Effort to Develop and Assess Critical Thinking Skills

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Goals For This Session

At the end of our time together, we will be successful if you:

- Are able to describe what we’re doing at USAFA to develop and assess critical thinking skills in our first-year core (i.e., GenEd) courses

- Walk away having begun to explore the implications of what we’ve learned for your own campus community
Introduction to USAFA

- Located just north of Colorado Springs, Colorado
- ~ 4000 students (undergraduate only)
- B.S. degree & commission as 2Lt in the US Air Force
USAFA Outcomes

ETHICS AND CITIZENSHIP
• Ethical Reasoning and Action
• Ethics and the Foundations of Character
• Respect for Human Dignity
• Service to the Nation

MENTAL AND PHYSICAL RESILIENCE
• Stamina
• Courage
• Discipline
• Teamwork

THINKING AND ACTING IN A COMPLEX WORLD
• Critical Thinking
• Decision Making
• Principles of Science and the Scientific Method
• Principles of Engineering and the Application of Technology
• Quantitative and Information Literacy
• Oral and Written Communication
• Lifelong Development & Contributions

NATIONAL SECURITY THROUGH DIVERSE PERSPECTIVES
• Heritage and Application of Air, Space and Cyberspace Power
• National Security and the Full Spectrum of Joint and Coalition Warfare
• Intercultural Competence and Involvement
• Civic, Cultural and International Environments

Character and Leadership

Integrity - Service - Excellence
THINKING AND ACTING IN A COMPLEX WORLD

- Critical Thinking
- Decision Making
- Principles of Science and the Scientific Method
- Principles of Engineering and the Application of Technology
- Quantitative and Information Literacy
- Oral and Written Communication
- Lifelong Development & Contributions
Academic Core Curriculum

Core = 101 Semester Hours

- Basic Sciences (27 hrs)
- Engineering (18 hrs)
- Humanities (24 hrs)
- Social Sciences (21 hrs)
- Military Strategic Studies (6 hrs)
- Phys Ed (5 hrs)
Meanwhile …

Our students are having difficulty evaluating evidence and forming clear arguments.
A Synergy Starts To Emerge

Institutional Outcome
(Ensures support, resources)

Individual Faculty Members
(Provide “spark” and sustained energy)
A Sampling of First-Year Core Courses

- Introduction to Military History
- Applications of Chemistry
- General Physics I
- Introduction to Behavioral Sciences
- Introduction to Air Force Engineering
- Introductory Composition and Research
- Introduction to Computing

Integrity - Service - Excellence
Collecting Dots ...
“Critical thinking is the process of questioning and analyzing assertions, in order to make an informed judgment or propose solutions. Three essential components of this process are the evaluation of relevant evidence, identification of biases and assumptions, and consideration of multiple perspectives.”
Developing Critical Thinking Skills

- Periodic meetings w/ faculty in 1st year courses
- Dissemination of “Critical Thinking Guide”
- More intentional (and explicit) efforts to incorporate critical thinking assignments in 1st year courses
- Improved efforts to help students “connect the dots”
- Interactions with (and support from) institutional resources
Assessing Critical Thinking Skills

◆ Critical thinking Assessment Test (CAT)
  - 15-item written test
  - Empirically validated
  - Short answer / essay reveals students’ thinking
  - Can be completed in a single hour-long class period
  - Scored “in-house” using detailed scoring guide

◆ We have begun to embed CAT analogs within 1st year courses
Applying What You’ve Learned

- Please pair up with someone you do not already know

- Discuss one or more of the “Questions For You To Consider”

- Report out
Questions?

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Each semester, the Dean’s office records the semester GPAs of each class. Here are the data from last semester:

1. Summarize the information presented in this graph.
2. Imagine that, after reviewing the graph above, a disgruntled parent calls for a thorough review of grading practices in lower-division courses, arguing that the data indicate that the grading standards in those courses are unfair and out of line with upper-division courses. Do the data in the graph provide convincing evidence in support of the parent’s conclusion?
3. Are there other explanations for the results above, besides the conclusion that the grading standards in lower-division courses are unfair and out of line with upper-division courses? If so, describe.
4. What additional information or evidence would more effectively substantiate the conclusion that the grading standards in lower-division courses are unfair and out of line with upper-division courses?