Teaching and Assessing for Critical Thinking and Deep Learning

Participant Packet

February 22, 2002
2:00 - 3:15 PM ET
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* Developed by Tom Angelo for STARLINK and the Texas Community College Teachers Association - 2/22/2002

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AGENDA

Introduction ............................................................................................................................ Anamaria Shaw  

Moderator

Program Presentation ........................................................................................................... Tom Angelo

I. Demographic Knowledge Assessment Exercise
II. What is Critical Thinking?
III. Why is Critical thinking so Difficult for Students to Master?
IV. Three Requirements for Critical thinking
   Dispositions
   Knowledge
   Skills
V. Persistent Instructional Barriers to Critical Thinking
VI. Seven Practical Approaches to Teaching and Assessing Critical Thinking
VII. Applications and Resources for Follow-up

Close .................................................................................................................................. Anamaria Shaw
EMAIL/FAX/CALL-IN INSTRUCTIONS

There are three ways in which you can interact with the panelists:

**E-MAIL:** You may e-mail your questions **in advance** to Henry Hartman at hhartman@dccc.edu and panelists will address them during the teleconference.

**FAX:** Before February 22, fax to 972.669.6699

On February 22, fax to 1.866.556.2985

**CALL:** You are encouraged at any time during the program to call in your questions and comments.

The toll-free telephone number for call-in questions is:

1.866.212.5221

**HOW IT WORKS:** Your call will be answered by a member of our staff, who will ask for your name and site location. You will then be put on hold. While you are on hold, you will be able to hear the videoconference through the telephone. Stay on the line so we can communicate with you if necessary.

If your call should be accidentally disconnected, call again and tell the operator you were disconnected while waiting to ask a question.

When prompted or introduced by the program host, give your name and site location, and state your questions as clearly and succinctly as you can. Please be aware that while you are asking your question and while it is being answered you will be “on the air.” Please remain on the line until your question has been answered and your call has been disconnected.

**BETTER AUDIO:** To minimize the possibility of any technical or program difficulties that may be caused by audio feedback, we suggest you locate the telephone away from the audio speaker at your site.
FAX-IN QUESTION SHEET

FAX:  1.866.556.2985

Enter your question or comment below in 25 words or less and print clearly so that the moderator can read the question.

Name:

Viewing Site, City, State:

Question or Comment:
PRESENTER:

Tom Angelo is currently Associate Provost for Teaching, Learning and Faculty Development, and Professor of Education at the University of Akron. He has also headed up learning centers at DePaul University, University of Miami, and Boston University. His publications include Classroom Assessment Techniques (with K. Patricia Cross, 1993) and Classroom Assessment and Classroom Research: An Update on Uses, Approaches, and Research Findings (1998). Since receiving his doctorate from Harvard's Graduate School of Education Dr Angelo has held fellowships from the Fulbright Program in Italy, the Gulberkian Foundation in Portugal, and served as a visiting scholar for the Higher Education Research and Development Society in Australia. In 1988 he was named one of America’s 40 Young Leaders of the Academy by Change Magazine.

MODERATOR:

Anamaria Diaz Shaw is currently Professor of English at Tarrant County College in Fort Worth, Texas. Dr. Shaw received her Ph.D. from Texas Christian University where she was also named Outstanding Teacher in 1996. Anamaria is presently Chair, Professional Development Committee of the Texas Community College Teachers’ Association.
As of the last US census update (2000), what percentages of the US population identified themselves as follows:

1. Asian & Pacific Islander?  
2. African-American/Black?  
3. Native-American/Indian?  
4. European-American/White?  
5. Members of other races?  
6. Multiracial?  
7. Hispanic/Latino?
Directed Paraphrasing

In 1 or 2 brief sentences, describe what critical thinking looks like when your students do it well – or what it would look like if they could do it well – by the end of a course you teach.

Critical Thinking is . . .

A Revision of Bloom's Taxonomy
(From Anderson & Krathwohl, 2001)

**CREATE**
Generate, Plan, Synthesize, Produce the New

**EVALUATE**
Critique or Judge based on Explicit Standards/Criteria

**ANALYZE**
Break Down, Relate Parts & Whole, Organize

**APPLY**
Follow Procedures to Solve Problems or Carry Out Tasks

**UNDERSTAND**
Connect New Learning to Prior Knowledge by Interpreting, Classifying, Comparing, Summarizing, etc.

**REMEMBER**
Elaborate, Encode, and Retrieve Information from Long-term Memory
Reflective Questions on Course Design

Thinking of a course you teach and know well: When, how, and why do students need to engage in critical thinking to succeed in that course?

- Identify and describe 2-3 important assignments, projects, tests, etc. that require critical thinking of your students

- How/when do you determine (assess) whether students have the necessary dispositions, knowledge and skills to do that CT?

- How/when do you teach and help students develop the necessary dispositions, knowledge and skills if they haven’t already mastered them sufficiently?

- How well does your evaluation and grading support the importance of the critical thinking work you require?
**Background Knowledge Probe #1**

In response to each name, term, or concept in bold print below, circle the number that best represents your current knowledge:

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<thead>
<tr>
<th>No. of Responses</th>
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<tr>
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<td>14</td>
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</table>

1. Federalism

   - (1) Have never heard of this
   - (2) Have heard of it, but don't really know what it means
   - (3) Have some idea what this means, but not too clear
   - (4) Have a clear idea what this means and can explain it

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2. Separation of Powers

   - (1) Have never heard of this
   - (2) Have heard of it, but don't really know what it means
   - (3) Have some idea what this means, but not too clear
   - (4) Have a clear idea what this means and can explain it

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<td>6</td>
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<tr>
<td>18</td>
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3. Republic

   - (1) Have never heard of this
   - (2) Have heard of it, but don't really know what it means
   - (3) Have some idea what this means, but not too clear
   - (4) Have a clear idea what this means and can explain it

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4. The *Constitution* of the U. S.

   - (1) Have never heard of this
   - (2) Have heard of it, but don't really know what it means
   - (3) Have some idea what this means, but not too clear
   - (4) Have a clear idea what this means and can explain it

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<td>8</td>
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<td>18</td>
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</table>

5. The *Articles of Confederation*

   - (1) Have never heard of this
   - (2) Have heard of it, but don't really know what it means
   - (3) Have some idea what this means, but not too clear
   - (4) Have a clear idea what this means and can explain it

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<tr>
<td>6</td>
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<td>4</td>
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</tbody>
</table>

6. James Madison

   - (1) Have never heard of this person
   - (2) Have heard of him, but don't really know who he was
   - (3) Have some idea who this was, but not too clear
   - (4) Have a clear idea who this was and can explain

<table>
<thead>
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<th>No. of Responses</th>
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<tr>
<td>3</td>
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<td>8</td>
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<td>15</td>
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</table>
Five Points to Consider on Prior Knowledge and Learning

We learn by making connections between prior knowledge and new information

It’s easier to make those connections when we see relationships between new information and prior knowledge

With adults, the biggest hindrance to learning is not usually lack of prior knowledge, but incorrect or partial prior knowledge

We’re generally reluctant to give up or change our prior knowledge and beliefs

Thus, learning can often be difficult and emotionally costly, and sometimes involves loss and grieving
Levels of Cognitive Development
or “Ways of Knowing”

Committed Constructivism
  Constructed Knowing
  “I understand why I believe this and why others don’t.”

Constrained Social Constructivism
  Procedural Knowing
    Connected Mode/Separate Mode
    “Every field has its own games with their own rules.”

Rampant Relativism
  Subjective Knowing
  “Everybody has an opinion and all opinions are equal.”

Naive Realism
  Received Knowing
  “Just give me the facts, Ma’am. Just the facts.

Received Truth
  Silence
  “What do you mean, how do I know this is true?”

What Does Research Suggest about Promoting Critical Thinking?

“. . . possible pedagogical strategies that are likely to enhance critical thinking: a strong emphasis on writing, a content focus on science and history, an interdisciplinary emphasis, and active engagement by the student in discussion, debate, class presentations, and talking over vocational and career plans.”


In other words, we’re likely to help students develop critical thinking skills if they are actively engaged in –

- Learning and practicing explicit processes for reasoning and communicating – whether it’s the scientific method, the writing process model, a particular historical method, or __________
- Working in structured small groups to talk about and solve messy, authentic problems – with feedback, guidance, and evaluation from experts
- Making their assumptions, beliefs, and ideas explicit to themselves and others through writing and speaking
- Evaluating, explaining, supporting, and justifying their ideas – and those of others – through writing and speaking
An Example of Grading Standards

Grading Standards for Writing in Seminar Portfolios

"A" work  
(1) Responds fully to the assignment;  (2) **Expresses its purpose clearly and persuasively**;  (3) Is directed toward and meets the needs of a defined audience;  (4) Begins and ends effectively;  
(5) **Provides adequate supporting arguments, evidence, examples, and details**;  (6) Is well-organized and unified;  
(7) Uses appropriate, direct language;  (8) **Correctly acknowledges and documents sources**;  (9) Is free of errors in grammar, punctuation, word choice, spelling, and format;  and,  
(10) Maintains a level of excellence throughout, and shows originality and creativity in realizing (1) through (7).

"B" work  
Realizes (1) through (9) fully and completely -- and demonstrates overall excellence -- but shows little or no originality or creativity.

"C" work  
Realizes (1) through (9) adequately -- and demonstrates overall competence -- but contains a few, relatively minor errors or flaws.  A "C" paper may show great creativity and originality, but those qualities don't make up for poor or careless writing.  A "C" paper usually looks and reads like a next-to-final draft.

"D" work  
Fails to realize some elements of (1) through (9) adequately -- and contains several, relatively serious errors or flaws, or many minor ones.  A "D" paper often looks and reads like a first or second draft.

"F" work  
Fails to realize several elements of (1) through (9) adequately -- and contains many serious errors or flaws, and usually many minor ones, as well.  An "F" paper usually looks and reads like a zero draft.
# A Sample Assessment/Grading Rubric

<table>
<thead>
<tr>
<th>Title of piece:</th>
<th>Author:</th>
<th>Date:</th>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Criteria</th>
<th>EXCELLENT</th>
<th>VERY GOOD</th>
<th>ADEQUATE</th>
<th>FAIR</th>
<th>POOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Responds fully to the assignment</td>
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<td>(2) Expresses its purpose clearly and persuasively</td>
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<td>(3) Is directed toward and meets the needs of a defined audience</td>
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<td>(4) Begins and ends effectively</td>
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<td>(5) Provides adequate supporting arguments, evidence, examples, and details</td>
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<tr>
<td>(6) Is well-organized and unified</td>
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<td>(7) Uses appropriate, direct language</td>
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<td>(8) Correctly acknowledges and documents sources</td>
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<tr>
<td>(9) Is free of errors in grammar, punctuation, word choice, spelling, and format</td>
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<td>(10) Maintains a level of excellence throughout</td>
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**OVERALL EVALUATION**

**COMMENTS:**
The S.E.E.S. Approach

If you want to increase the chances that your reader sees your point clearly:

State

Explain

Exemplify, then

Summarize
### Defining Features Matrix

**Comparing Teaching-centered and Learning-centered Approaches**

*Directions:* In the left-hand column below are features we could use to define and distinguish different approaches to instruction. Place plus signs (+) in columns next to features that characterize Teaching-centered or Learning-centered approaches. Place minus signs (-) next to features that do not.

<table>
<thead>
<tr>
<th>DEFINING FEATURES</th>
<th>Teaching-Centered</th>
<th>Learning-Centered</th>
</tr>
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<tbody>
<tr>
<td>Focused on the quantity of content teachers cover</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Focused on the quality of students’ learning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher &amp; content are the centers of attention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students &amp; content are the centers of attention</td>
<td></td>
<td></td>
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<tr>
<td>Individual work is required and valued</td>
<td></td>
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<tr>
<td>Cooperative work is also required and valued</td>
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<td></td>
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<tr>
<td>Teachers “transmit” knowledge to students</td>
<td></td>
<td></td>
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<tr>
<td>Knowledge is “constructed” by students with guidance from teachers</td>
<td></td>
<td></td>
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<tr>
<td>Primary aim is to help students learn</td>
<td></td>
<td></td>
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<tr>
<td>Students’ prior knowledge is irrelevant</td>
<td></td>
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<tr>
<td>Students’ prior knowledge is critical</td>
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Stimulating Intellectual Growth
Through Class Discussions

To challenge and involve students who are at various stages of intellectual development, pose at least one discussion question on each major course theme/topics that students can successfully answer by:

1. Finding and communicating the (factually) "right" answer.

2. Formulating and stating their own opinions/positions without supporting them with evidence or justification acceptable to the discipline.

3. Identifying alternative opinions/positions and supporting them with evidence or justification that’s acceptable to the discipline – even if the students don’t personally believe or accept those opinions/positions or the evidence/justifications they’ve presented.

4. Applying disciplinary criteria to evaluate a situation which requires them to consider personally relevant ethical/values questions.

Please Note: This exercise is adapted from one presented by Dr. Craig Nelson (Professor of Biology and Public and Environmental Affairs, Indiana University) in a workshop at the 10th Lilly Conference on College Teaching, Miami University, Oxford, Ohio, November 17, 1990.
A Sample
Groupwork Evaluation Form

1. Overall, how effectively did your group work together on this assignment? (circle the appropriate response)

   1 not at all  2 poorly  3 adequately  4 well  5 extremely well

2. How many of the five group members participated actively most of the time? (circle the appropriate number)

   0 1 2 3 4 5

3. How many of you were fully prepared for the groupwork most of the time? (circle the appropriate number)

   0 1 2 3 4 5

4. Give one specific example of something you learned from the group that you probably wouldn't have learned on your own.

5. Give one specific example of something the other group members learned from you that they probably wouldn't have learned without you.

6. Suggest one specific, practical change the group could make that would help improve everyone's learning.

**Pro and Con Grid**

**DIRECTIONS:** Considering everything you know about explicitly teaching critical thinking at this point, what do you see as the most significant pros and cons -- or costs and benefits -- of using this approach. List at least three important cons (costs) and at least three pros (benefits) below. Then list any unanswered questions you’d like to follow up.

<table>
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<th>Cons/Costs of</th>
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<tr>
<th>Pros/Benefits of</th>
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<table>
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<tr>
<th>Unanswered questions to follow-up</th>
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APPLICATIONS CARD

DIRECTIONS: Please take a moment to recall the ideas, techniques, and strategies we've discussed -- and those you've thought up -- to this point in the session. Quickly list as many possible applications as you can. Don't censor yourself! These are merely possibilities. You can always evaluate the desirability and/or feasibility of these application ideas later.

| Interesting IDEAS/TECHNIQUES from this session | Some possible APPLICATIONS of those ideas/techniques to my work |

TEN LEVERS FOR HIGHER LEARNING
Guidelines from Research and Good Practice
For Improving Teaching, Assessment, and Learning

In general, our students will learn more -- and more deeply -- when we help them to . . .

Engage actively – intellectually and emotionally -- in their academic work

Set and maintain realistically high, personally meaningful expectations and goals

Provide, receive, and make use of regular, timely, specific feedback

Become explicitly aware of their values, beliefs, preconceptions, and prior learning -- and are willing to unlearn when necessary

Are provided with “scaffolding” – ways to structure their thinking and studying – that becomes progressively more internalized and personalized over time

Seek and find connections to and real-world applications of what they’re learning

Understand and value the criteria, standards, and methods by which they are assessed and evaluated

Work regularly and productively with academic staff

Work regularly and productively with other students

Invest as much engaged time and high-quality effort as possible in their academic work
**CRITICAL THINKING: HOW SOME AUTHORS DEFINE IT**

“Critical thinking, as we define it here, means reviewing the ideas we have produced, making a tentative decision about what action will best solve the problem or what belief about the issue is most reasonable, and then evaluating or refining that solution or belief.”


“[Critical thinking is] . . . “an investigation whose purpose is to explore a situation, phenomenon, question or problem [in order] to arrive at a hypothesis or conclusion that integrates all available information and that can therefore be convincingly justified. In critical thinking, all assumptions are open to question, divergent views are aggressively sought, and the inquiry is not biased in favor of a particular outcome.”


“. . . critical thinking appears to stress the individual’s ability to interpret, evaluate, and make informed judgments about the adequacy of arguments, data, and conclusions.”


“. . . most formal definitions of critical thinking include the intentional application of rational, higher-order thinking skills such as analysis, synthesis, problem-recognition and problem-solving, inference, and evaluation.”


“Critical thinking is not simply being highly critical of everyone else’s thinking but your own.”

A Few Key References

On Understanding and Improving College Teaching and Learning


REFERENCES ON UNDERSTANDING, TEACHING, AND ASSESSING CRITICAL THINKING


UPCOMING PROGRAMS

February 28, 2002  
2:30 – 4:00 PM ET  
“Improving Multimedia and Online Courses with Instructional Design”

March 5, 2001  
2:30 - 4:00 PM ET  
“Annual Carl Perkins RFQ Teleconference”

March 7, 2002  
2:30 – 4:00 PM ET  
“Are We Testing What We Are Teaching? How to Construct Accurate and Useful Tests”

April 4, 2002  
2:30 – 4:00 PM ET  
“Successful Student Recruitment Strategies”

April 23, 2002  
1:00 - 2:30 PM ET  
“Successfully Involving Faculty in Your Continuous Improvement Program”

For more information, visit our website at: www.starlink.dcccd.edu.
### EVALUATE “TEACHING AND ASSESSING...”

On a scale of 1-5, with 5 being the highest, rate the videoconference in terms of its value to you.

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<thead>
<tr>
<th></th>
<th>Excellent</th>
<th>Poor</th>
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<tbody>
<tr>
<td>Timeliness of topic</td>
<td>5</td>
<td>4</td>
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<td>Objectives clearly stated and</td>
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<td>4</td>
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<td>supported with effective program</td>
<td>4</td>
<td>3</td>
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<tr>
<td>elements (discussions, videos,</td>
<td>3</td>
<td>2</td>
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<tr>
<td>interviews, demos, etc.)</td>
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<td>1</td>
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<tr>
<td>Moderator</td>
<td>5</td>
<td>4</td>
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<tr>
<td>Panelists or Instructor</td>
<td>5</td>
<td>4</td>
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<tr>
<td>Handouts</td>
<td>5</td>
<td>4</td>
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<td>Technical quality</td>
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<td>4</td>
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<tr>
<td>Overall evaluation of program</td>
<td>5</td>
<td>4</td>
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<tr>
<td>Local site activities were held?</td>
<td>YES</td>
<td>NO</td>
</tr>
</tbody>
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1. Institution name: _____________________________________________________________

2. My current position is: (circle one)
   - a. Board Member
   - b. Faculty
   - c. Administrator/Professional Staff
   - d. Classified Staff
   - e. Other ________________________

3. What did you like most about the videoconference?

4. What could have been done to make it more valuable to you?

5. What topics would you like to see addressed in future videoconferences?

Return to: STARLINK, 9596 Walnut St., Dallas, TX 75243.