

## ED 589: Thinking Critically with Data

Instructor of record:	Dr. Teresa Yohon
Address:	5151 Boardwalk Dr. F-3 Fort Collins, CO 80525
Email:	tyohon@enetlearning.org or tyohon@comcast.net
Phone:	970-217-3672
Fax:	303-337-6845
Course Credit:	2.0 graduate credits
Dates & Times:	Online, Asynchronous: Beginning June 2017 (and be offered Spring, Summer, Fall and Winter Sessions thereafter).  The Student must spend a <u>minimum</u> of six hours per week over six weeks in the LMS completing course requirements.

### COURSE DESCRIPTION:

Thinking Critically with Data is an interactive e-learning course that examines critical thinking with a focus on data analysis in our information-rich world. In this course, teachers explore practical skills and strategies to draw on when teaching students to think critically about the information around them. Teachers will understand how to design student projects and assessments that address critical thinking skills when collecting and analyzing data. Additionally, they will see how technology can support student's collection, organization, and presentation of data. The course also offers practical tips for implementing projects that ask students to think critically with data. eNetLearning Certified Facilitators will be online and available for support and assistance.

### STUDENT LEARNING OUTCOMES:

Upon completion of this course, participants will be able to:

1. Explain how thinking critically about data spans all subject areas.
2. Evaluate examples of critical thinking with data using the Data Project Process.
3. Investigate and evaluate projects that focus on thinking critically with data.
4. Review standards and objectives related to thinking about and with data.

5. Evaluate data resources, including online primary sources and data sets.
6. Apply the appropriate skills and attitudes students need for collecting data.
7. Identify effective ways for students to share the results of data gathering and analysis.
8. Explore tools that support the collection, organization, and analysis of data.
9. Provide a variety of tools and resources to help manage projects in which students use data.
10. Demonstrate best practices for displaying information graphically.
11. Create graphs and charts for data presentation, and recognize misrepresented data.
12. Incorporate instructional strategies and tools effectively for helping students think critically.
13. Review tips and resources for organizing data collection experiences outside the classroom.
14. Create an action plan that incorporates projects and activities where Thinking Critically with data tools can be used in the classroom
15. Design student projects and assessments from action plan that address critical thinking skills

#### TEXTS, READINGS, INSTRUCTIONAL RESOURCES:

Course materials will be provided via eNetLearning and the on-line course module. See <http://online.enetlearning.org/>

#### COURSE REQUIREMENTS:

In order to receive a Passing grade, the participant must complete the following course requirements:

1. Course activities:
  - a) Attend orientation session and participate in course forum discussions, projects, and activities.
2. Online activities: Each student will complete the following:
  - a) Assigned readings, links, videos and research on resources.
  - b) Complete all Sessions and Lessons/ Activities.
  - c) Reply to all discussion forums within each of the orientation and 6 modules using the course posting self-assessment rubric as a guideline.
  - d) Respond to at least two other postings within each module discussion forum sharing your ideas and thoughts.
  - e) Complete and post Action Plan following the course guidelines. This plan should include the following:
    - your reasoning and motivation for providing data information within your plans/projects
    - state standards related to your action plan
    - ISTE standards related to you plan
    - integration of online learning strategies

- a list of data collection tools and resources that will be used in the design of your action plan
  - a list of online tools and resources for your students and the location of those resources
  - assessment rubrics and their use for gauging and checking for understanding
  - steps to ensure safe and ethical online learning
  - implementation considerations of data collection activities, evaluations and feedback related to your plan
- f) Participate in Final Sharing Showcase where you will present and explain your action plan to the cohort. A self-assessment rubric and course assessment rubric will be used for grading criteria.

#### GRADE DISTRIBUTION AND SCALE:

##### Grade Distribution:

Attendance at Orientation/face-to-face Session	10%
Online Module Discussions	30%
Action Plan	50%
Final Sharing Showcase	10%

##### Grade Scale:

90-100%	A
80-89%	B
79% and below	F

## CLASS SCHEDULE:

This "blended-learning" course will include at 6-7 hours of on-line web conferencing components (Adobe Connect) or face-to-face connection and an on-line facilitated course that will include 30+ hours of interactive tutorials, exercises, individual work, and facilitated discussions. The 30+ hours of on-line facilitated course work will take place over a 6-7 week period.

### **Week One: Orientation**

Overview of course requirements and resources

1. Face to face and/or synchronous web-conferencing
2. Introduction to on-line course delivery application
3. Getting To Know You Discussion Forum
4. Begin Module 1: Information in Society and the Classroom

### **Week Two: Module 1: Information in Society and the Classroom**

Module 1 introduces critical thinking skills needed to interpret and use information effectively. This module provides examples of critical thinking in all subject areas and projects that incorporate many forms of data analysis.

#### **Outcomes**

- Understand and explain the importance of thinking critically about information in contemporary society.
- Examine how thinking critically about data spans all subject areas.
- Explore and evaluate examples of critical thinking with data using the Data Project Process.

#### **Lessons**

- Lesson 1: Critical Thinking in the Digital Age
- Lesson 2: Critical Thinking about Data
- Lesson 3: Data Projects
- Lesson 4: Module Review

### **Week Three: Module 2: Project Design for Critical Thinking**

Module 2 guides teachers through the process of designing a unit that engages students in thinking critically with data as they learn subject-area content. Teachers see examples of projects and explore ways to incorporate standards and assessments for critical thinking skills.

#### **Outcomes**

- Investigate projects that focus on thinking critically with data.

- Review and build standards and objectives related to thinking about and with data.
- Explore and evaluate and build assessments for critical thinking skills.
- Explore and create a list of data resources to include online primary sources/ data sets.

### **Lessons**

- Lesson 1: Types of Projects
- Lesson 2: Learning Goals
- Lesson 3: Critical Thinking Assessment
- Lesson 4: Data Sources
- Lesson 5: Module Review

### **Week Four: Module 3: Skills for Thinking Critically with Data**

In Module 3, teachers learn the essential critical thinking skills and attitudes necessary for students to be successful in projects involving the collection, analysis, and use of data to support conclusions and share findings. They also review the necessary components for fair and accurate visual representations of data.

### **Outcomes**

- Learn the appropriate skills and attitudes students need for collecting data.
- Explore and develop critical thinking skills utilizing the need to analyze information quality, patterns, and relationships.
- Discussion and refine the process of drawing conclusions from data and recognize common errors of data interpretation.
- Identify effective ways for students to share the results of data gathering and analysis.

### **Lessons**

- Lesson 1: Data Collection
- Lesson 2: Data Analysis
- Lesson 3: Conclusions
- Lesson 4: Research Outcomes
- Lesson 5: Module Review

### **Week Five: Module 4: Tools for Effective Data Analysis**

Module 4 explores how technology supports visual displays of data to clarify ideas, analyze patterns and relationships, and present information. In this module, teachers learn about common errors made when displaying data and how data can be misrepresented visually. They also learn how to develop and evaluate an evidence-based argument in a visual representation.

## **Outcomes**

- Explore, Evaluate and Create a list of tools that support the collection, organization, and analysis of data.
- Evaluate and discuss best practices for displaying information graphically.
- Create graphs and charts for data presentation, and recognize misrepresented data.
- Develop an online data area using *RankForce* to present and evaluate an argument.

## **Lessons**

- Lesson 1: Data Organization with Technology
- Lesson 2: Visual Presentation of Data
- Lesson 3: Results with Technology
- Lesson 4: Showing Evidence
- Lesson 5: Module Review

## **Week Six: Module 5: Critical Thinking and Instruction**

Module 5 introduces the methods and tools that teachers can use for instruction in critical thinking about data. Teachers also learn strategies for helping students be successful at collecting data outside the classroom.

### **Outcomes**

Learn instructional strategies and tools for helping students think critically.

Explore tools and resources to help manage projects in which students use data.

Learn how to create graphs and charts for data presentation, and recognize misrepresented data.

Review tips and resources for organizing data collection experiences outside the classroom.

### **Lessons**

- Lesson 1: Critical Thinking Skills Instruction
- Lesson 2: Management of Projects with Data
- Lesson 3: Data Collection in the Field
- Lesson 4: Module Review

## **Week Six: Course Wrap-Up**

- Final submission of completed Action Plan
- Showcase of your Action Plan with fellow participants
- Final evaluation and wrap-up activities