Intel® Teach Elements

Thinking Critically with Data

Syllabus

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 students' collection, organization, and presentation of data. The course also offers practical tips for implementing projects that ask students to think critically with data.

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 the importance of thinking critically about information in contemporary society.
- Examine how thinking critically about data spans all subject areas.
- Explore 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

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 standards and objectives related to thinking about and with data.
- Understand the assessment of critical thinking skills.
- Explore data resources, including online primary sources and 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

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 critical thinking skills students need to analyze information quality, patterns, and relationships.
- Understand 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

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 using the Intel® Education *Showing Evidence Tool.*

Outcomes

- Explore tools that support the collection, organization, and analysis of data.
- Learn best practices for displaying information graphically.
- Learn how to create graphs and charts for data presentation, and recognize misrepresented data.
- Understand how to use data with the *Showing Evidence Tool* 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

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

Course Length

Total hours to complete the course depend on how the course is taken (self-paced or facilitated), the number of optional activities completed, and the delivery method (face-to-face or online):

- **E-learning:** 5–6 hours individual work, learning concepts of critical thinking with data in interactive tutorials and exercises
- **Action Planning:** 8–12 hours of individual work, applying critical thinking with data principles to the classroom
- **Facilitated Discussions:** 5–8 hours of sharing ideas with other teachers and giving feedback on Action Plans (varies with format, face-to-face or online, and optional exercises)