Intel® Teach Elements

Thinking Critically with Data

Facilitation Guide

July 2012

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Contents

Overview of Course Facilitation

Course Description

This Facilitation Guide provides information to successfully facilitate face-to-face or online discussion sessions, based on participants' Action Plan work in the Intel® Teach Elements: Thinking Critically with Data course. Participants taking a facilitated course may receive continuing education credit, when defined and arranged by the school, district, or education agency offering a facilitated course.

Participants in facilitated courses will participate in three ways:

- **E-learning:** Learn about collaboration in digital classrooms using interactive tutorials (approximately 5 hours of individual work)
- **Action Planning:** Apply collaboration strategies to one's own classroom (5 to 12 hours of individual work based on optional activities and individual engagement in the planning exercises)
- **Facilitated Discussions:** Share ideas and give feedback on Action Plan work (4 to 8 hours, varies by format—face-to-face or online—and optional exercises)

The e-learning component of the Thinking Critically with Data course has five modules plus an Orientation and Wrap-Up. Each module includes four to six lessons of interactive activities with exercises that introduce and explore concepts. Many of the activities are followed by an Action Plan task. The Action Plan tasks are designed for application of the concepts to one's own classroom. Course facilitation is structured around the Action Plan, with facilitation typically occurring after participants complete one to two Action Plan tasks.

By the end of the course, participants who complete the Action Plan will have designed a project and assessments that address critical thinking skills when collecting and analyzing data. The Action Plan is required for participants who are taking the course for credit by engaging in a facilitated course.

The Facilitator

Facilitators provide richer, more meaningful course experiences for participants by guiding individual work and group discussions. Before facilitating the course, facilitators should meet the following requirements.

Facilitator requirements:
- Familiarity with 21st century skills, data collection and analysis, online tools, project-based learning, and technology integration
- Prior experience with facilitating technology integration courses for teachers
- Online facilitation experience (if facilitating online, or co-facilitating with an experienced online facilitator)

- Thorough experience with the e-learning course, including:
  - Review all supporting resource files
  - Take all quizzes, intentionally trying to get correct and incorrect answers
  - Complete the Action Plan
  - Review Isaac's and Holly's Action Plans, available in the course Resources

Facilitators set the tone for the course discussions. Facilitators can create a rewarding experience for participants by fulfilling the following responsibilities.

Facilitator responsibilities:
- Engage all participants in discussions
- Encourage participants to think critically and deeply about their own practices
- Provide and promote thoughtful and constructive feedback
- Clarify concepts and answer questions
- Promote reflective teaching
- Create a supportive learning community

Facilitation Options

Course participants complete interactive e-learning tutorials and Action Plan activities independently between facilitated sessions, where they join discussions to share and give feedback on their work and learning. Course facilitation is flexible and can be done in different settings—fully face-to-face, online, or various combinations of face-to-face and online.

Facilitated Face-to-Face

Participants may take the course from a CD or online. Discussions take place in a face-to-face setting. Facilitators can print the discussion questions or display them for participants. The discussions are flexible—choose some or all to do or create your own questions and format.

Facilitated Online

Participants take the course online and engage in online facilitated discussions. The discussions may be posted on a Web site or embedded in a learning management system (LMS). Facilitators may also choose to use other online tools to support learning and discussion.

Face-to-Face and Online Hybrid

A combination of face-to-face and online facilitation is possible. For example, the discussions may begin with a face-to-face meeting, continue online, and meet again at the end for a face-to-face session.

Course Length

A course schedule is designed locally through the selection of suggested and optional activities as well as the number and length of discussions. The course completion section of this guide provides time estimates for course planning. Continuing education credit and/or certificates of completion may be given based on the length of the course and acceptable participation levels, determined by the local program and/or the facilitator.

Intel® Education Online Community

An option for any of the facilitation formats is to create a group to support your training in the Intel® Education Online Community. Facilitators can create groups to support participants with online discussions or provide opportunities to publish Action Plans for feedback. To join the community, register at http://engage.intel.com. Then, review tips on creating a group in the Teachers Engage > Intel® Teach Professional Development > Facilitate section.

Facilitators will also want to join the Elements Implementation Toolkit group in Teachers Engage. After registering for Teachers Engage, then go to groups and search for Elements Implementation Toolkit or use this link, http://engage.intel.com/groups/intel-teach-elements-implementation-toolkit.

Discussion Schedules

Course facilitation is structured around discussions and sharing of completed Action Plan tasks, with facilitation sessions typically occurring after participants complete several of the lessons in the e-learning course and one to two Action Plan activities. Participants need to complete the recommended e-learning and Action Plan activities prior to each discussion session to ensure rich conversations and more beneficial experiences.

Facilitated discussion sessions are flexible. Face-to-face discussions range from 20 to 45 minutes and can be combined for longer face-to-face sessions. Online facilitation times will vary and will depend on how often and when participants visit the discussion board. Typically, online discussion time takes longer than face-to-face.

The following tables show example facilitation schedules with Action Plan activities that should be completed prior to discussions. A fully facilitated course (face-to-face or online) should take place over 5 or 6 weeks to allow sufficient time between sessions for participants to complete the Action Plan activities and possibly try new ideas in the classroom. The schedules do not include times needed for introducing

the course, which will vary by the get acquainted activities you design.

Schedule Example 1: Facilitation Sessions after Each Module

Module 1	Module 2	Module 3	Module 4	Module 5	Wrap-Up
Lesson 2 Activity 4	Lesson 1 Activity 3	Lesson 1 Activity 3	Lesson 2 Activity 3	Lesson 1 Activity 5	Summary
Lesson 3 Activity 2	Lesson 2 Activity 2	Lesson 3 Activity 2	Lesson 4 Activity 2	Lesson 3 Activity 1	
	Lesson 3 Activity 1				
Facilitation Time: 40 min	**Facilitation Time: 60 min**	**Facilitation Time: 40 min**	**Facilitation Time: 40 min**	**Facilitation Time: 40 min**	**Facilitation Time: 15 min**

Schedule Example 2: Facilitation Sessions at Beginning, Middle, and End of the Course

Module 1	Module 2	Module 3	Module 4	Module 5	Wrap-Up
Lesson 2 Activity 4	Lesson 1 Activity 3	Lesson 1 Activity 3	Lesson 2 Activity 3	Lesson 1 Activity 5	Summary
Lesson 3 Activity 2	Lesson 2 Activity 2	Lesson 3 Activity 2	Lesson 4 Activity 2	Lesson 3 Activity 1	
	Lesson 3 Activity 1				
Facilitation Time: 40 min		**Facilitation Time: 1 hr 40 min**			**Facilitation Time: 1 hr 35 min**

Schedule Example 3: Facilitation Sessions at Middle and End of Course

Module 1	Module 2	Module 3	Module 4	Module 5	Wrap-Up
Lesson 2 Activity 4	Lesson 1 Activity 3	Lesson 1 Activity 3	Lesson 2 Activity 3	Lesson 1 Activity 5	Summary
Lesson 3 Activity 2	Lesson 2 Activity 2	Lesson 3 Activity 2	Lesson 4 Activity 2	Lesson 3 Activity 1	
	Lesson 3 Activity 1				
		Facilitation Time: 2 hr 20 min			**Facilitation Time: 1 hr 35 min**

Facilitated Discussions

Once the facilitation format and schedule have been determined, and participants have been invited, consider group organization. Discussion formats are indicated in the Course Facilitation section of the Facilitation Guide as whole group, small groups, and pairs. Discussions help participants exchange ideas, process information, develop new ideas, and refine thinking.

For online discussions, you may want to set up your discussion boards by modules, with separate discussion for each activity. You can create different discussion strands based on whether the discussions are whole group or small group.

Whole group discussions: The intent of whole group discussions is to foster a learning community to exchange ideas to benefit from others' ideas. When conducting a whole group discussion, consider these tips:

- Establish ground rules so all participants feel safe to share their ideas
- Encourage everyone to participate
- Start with a getting to know each other activity at the first meeting or as a first online activity
- Acknowledge and respect all ideas, even if you do not agree with them

Small group discussions: Small group discussions provide a more intimate way for participants to delve deeper into topics and get crucial feedback. The ideal size for small groups is four participants. Groups can be organized by similar grade levels and subject areas, or mixed grade and subject areas. Participants can stay in their same groups for each discussion or can mix. For some discussions, remaining with the same group may be advantageous as participants become familiar with each other's Action Plans. For others, mixing groups may be advantageous to get different perspectives.

For some feedback sessions, pairs of participants within the small groups may be more productive. Working in pairs provides more time for review and feedback.

To aid discussions, the Appendix includes:

- **Discussion Suggestions:** Tips for engaging in group work
- **Discussion Checklist:** Tips on creating constructive discussions during face-to-face and online discussions

Course Completion

Course completion is based on the hours spent on e-learning, the Action Plan, and facilitated discussions. The combined time for these three components will vary depending on the delivery format, depth and length of discussions, and completion of

optional exercises. These timings are defined based on local training needs and context. Approximate timing guidelines for the course are as follows:

Module	E-Learning	Action Plan Suggested	Facilitation
Orientation	15 minutes	None	30 minutes or more
Module 1	55 minutes	50 minutes	40 minutes
Module 2	60 minutes	65 minutes	60 minutes
Module 3	60 minutes	65 minutes	40 minutes
Module 4	60 minutes	55 minutes	40 minutes
Module 5	60 minutes	50 minutes	40 minutes
Wrap-Up	5 minutes	15 minutes	15 minutes
Total Hours	**5 hr 25 min**	**5 hr**	**4 hr 20 min**

Note: Completion of all Action Plan activities is estimated at 5 hours minimum. The Appendix provides estimated times for all activities by module.

Continuing education credits and course completion certificates are arranged by the facilitator, based on school or district guidelines. You are encouraged to issue continuing education credit and course completion certificates, according to local needs and expectations.

When your course is completed, please report the number of participants who completed the course at http://engage.intel.com/groups/intel-teach-elements-implementation-toolkit.

Course Facilitation

Each facilitation activity described in this section indicates the e-learning and Action Plan activities that participants need to have completed. Before facilitation sessions, inform participants which e-learning and Action Plan activities they need to complete. An estimated time is also included for face-to-face meetings.

The discussion questions included in the activities are suggestions. Whole group, small group, and peer discussion questions are included. Please feel free to include supplemental questions or use the suggested questions as guidelines for developing your own questions. Peer Feedback indicates prompts for participants to use in giving feedback. Consider having the items listed in the Appendix printed for

participants' reference during face-to-face facilitation.

Introduction: Course Orientation

Regardless of the format of your course, you will want to begin with activities for participants to get acquainted with each other and then use the Orientation e-learning module to introduce the course itself.

Orientation has five short lessons that introduce the course objectives and structure in general, the features and navigation of the e-learning environment, and the Action Plan. In a face-to-face session, you can walk through the lessons and the user interface as a group to assure everyone is familiar with the course features. If your course is online, you will want to encourage sharing any questions about the e-learning features or Action Plans in an introductory discussion. In both course formats, this is a good time to review technical requirements for the course found in the Resources tab and the FAQ document found online at the Elements site at www.intel.com/education/elements.

Facilitation Tip: Feedback from Elements course evaluations has shown that the example Action Plans are very helpful to participants. Calling attention to the Isaac's and Holly's Action Plan during course introduction is highly recommended.

Module 1: Information in Society and the Classroom

Module 1 Facilitation 1: Visual Representation

This discussion should occur after participants complete the e-learning and Action Plan activities through *Module 1, Lesson 2, Activity 4.*

Face-to-Face Facilitation Time: 20 minutes

- **Large Group Discussion:** Discuss the types of data that students use in your classroom and how they use the data.
- **Peer Feedback:** Provide feedback and suggestions for using data.

Facilitation Tip: If participants have a hard time coming up with examples, provide examples of different types of data (qualitative and quantitative) that can be used in different subject areas.

Module 1 Facilitation 2: Student-Centered Projects

This discussion should occur after participants complete the e-learning and Action Plan activities through *Module 1, Lesson 3, Activity 2.*

Face-to-Face Facilitation Time: 20 minutes

- **Small Group Discussion:** How do you think the Data Project Process could be used in your class? Share how a lesson or activity could be improved using

the Data Project Process.

- **Peer Feedback:** Provide feedback and suggestions for using the Data Project Process.

Facilitation Tip: Provide examples and discuss how the Data Project Process is, or could be, incorporated into particular Unit Plans. You may want to use the Unit Plans file.

Module 2: Project Design for Critical Thinking

Module 2 Facilitation 1: Collaborative Projects

This discussion should occur after participants complete the e-learning and Action Plan activities through *Module 2, Lesson 1, Activity 3*.

Face-to-Face Facilitation Time: 20 minutes

- **Whole Group Discussion:** Describe a unit that you plan to create or enhance through an emphasis on thinking critically with data. Is it a descriptive, persuasive, or design project?
- **Peer Feedback:** Share your ideas and suggestions for incorporating thinking critically with data into the shared units.

Facilitation Tip: Prepare examples of how units could be improved with an emphasis on thinking critically with data. Review the different types of projects that lend themselves to data collection and analysis: descriptive, persuasive, and design.

Module 2 Facilitation 2: Learning Objectives

This discussion should occur after participants complete the e-learning and Action Plan activities through *Module 2, Lesson 2, Activity 2*.

Face-to-Face Facilitation Time: 20 minutes

- **Small Group Discussion:** Share the standards and objectives for your unit.
- **Peer Feedback:** Provide suggestions and feedback.

Facilitation Tip: Help participants use the Standards Key Words document to improve their standards and objectives. If needed, remind participants to make sure that all standards are addressed in their objectives.

Module 2 Facilitation 3: Assessment of Data Processes

This discussion should occur after participants complete the e-learning and Action Plan activities through *Module 2, Lesson 3, Activity 1*.

Face-to-Face Facilitation Time: 20 minutes

- **Small Group Discussion:** How will you assess your students' process skills as they work with data? What adaptations will you make to the assessments

you saved?

- **Peer Feedback:** Provide suggestions for improving process skills assessment.

Facilitation Tip: Use the *Assessing Projects* application to show different assessments and how to adapt them. Assessments might include an Analysis Rubric, Argumentation Rubric, Interpretation Rubric, and Reasoning Checklist, for example.

Module 3: Skills for Thinking Critically with Data

Module 3 Facilitation 1: Strategies for Accuracy

This discussion should occur after participants complete the e-learning and Action Plan activities through *Module 3, Lesson 1, Activity 3*.

Face-to-Face Facilitation Time: 20 minutes

- **Small Group or Pairs Discussion:** Share your research questions and the strategies you plan to use to help students think more critically about the possible bias and the accuracy of the data they collect.
- **Peer Feedback:** Provide suggestions for improving research questions and developing critical thinking skills for understanding data collection.

Facilitation Tip: Review some of the examples from the e-learning course to demonstrate the types of errors students may encounter when using data.

Module 3 Facilitation 2: Data Interpretation

This discussion should occur after participants complete the e-learning and Action Plan activities through *Module 3, Lesson 3, Activity 2*.

Face-to-Face Facilitation Time: 20 minutes

- **Small Group or pairs Discussion:** Share your revised objectives and your plan for how students will organize, check, analyze, and draw conclusions using data.
- **Peer Feedback:** Give feedback and share ideas.

Facilitation Tip: Review the organize-check-analyze process as well as Marzano's Analysis Process.

Module 4: Tools for Effective Data Analysis

Module 4 Facilitation 1: Data Organization and Display

This discussion should occur after participants complete the e-learning and Action Plan activities through *Module 4, Lesson 2, Activity 3*.

Face-to-Face Facilitation Time: 20 minutes

- **Small Group Discussion:** Share an overview of your project and explain

> your ideas for how students will collect, sort, and display data.
- **Peer Feedback:** Provide feedback to peers, suggesting strategies collecting, sorting, and displaying data as well as ideas for how to teach students the skills they will need.

Facilitation Tip: Be prepared to address challenges that participants may anticipate with using data collection tools to collect, sort, and display data. You may want to demonstrate the Intel® Education *Help Guide* which provides step-by-step instructions for using Microsoft Excel*.

Module 4 Facilitation 2: Tools for Data Presentation

This discussion should occur after participants complete the e-learning and Action Plan activities through *Module 4, Lesson 4, Activity 2*.

Face-to-Face Facilitation Time: 20 minutes

- **Group Discussion:** Share the online tools that you are considering using with your students.
- **Peer Feedback:** Provide additional suggestions of online tools.

Facilitation Tip: Choose a few tools to demonstrate data presentation. Familiarize yourself with *Showing Evidence* if participants have questions about the tool.

Module 5: Critical Thinking and Instruction

Module 5 Facilitation 1: Mini-Lessons and Critical Thinking

This discussion should occur after participants complete the e-learning and Action Plan activities through *Module 5, Lesson 1, Activity 5*.

Face-to-Face Facilitation Time: 20 minutes

- **Small Group (or Pairs) Discussion:** Discuss critical thinking skills that you might teach with mini-lessons during your project.
- **Peer Feedback:** Share suggestions for ways to teach the critical thinking skills.

Facilitation Tip: Provide feedback and suggestions for types of mini-lessons for metacognition, data analysis, and drawing conclusions, for example.

Module 5 Facilitation 2: Collaboration and Fieldwork

This discussion should occur after participants complete the e-learning and Action Plan activities through *Module 5, Lesson 3, Activity 1*.

Face-to-Face Facilitation Time: 20 minutes

- **Small Group Discussion:** Describe how your students will collaborate and how you will manage this collaboration. Also, discuss the kinds of fieldwork

you are planning and any challenges you think you may face.

- **Peer Feedback:** Offer suggestions and ideas for helping students collaborate and conduct fieldwork.

Facilitation Tip: Provide examples of collaborative projects and share any experiences you have with collaborative projects or fieldwork.

Course Wrap-Up

Wrap-Up Facilitation 1: Summary

This optional discussion should occur after participants complete the e-learning and Action Plan activity in Wrap-Up.

Face-to-Face Facilitation Time: 15 minutes

- **Whole Group Discussion:** Share some key learnings from the course, asking questions such as:
  a. How will you apply some of the ideas in the course?
  b. What did you find, or expect to find challenging when implementing the ideas from the course?
- **Complete Survey:** Remind participants to complete a short online survey, accessed from a link on the final screen of the course.
- **Distribute:** Hand out certificates of completion.
- **Report the number of teachers you trained:** Visit the Elements Implementation Toolkit Group (*http://engage.intel.com/groups/intel-teach-elements-implementation-toolkit*), log in, and click Report Teachers Trained.

Appendix

Time Estimates for Action Plan Activities

Completion of all Action Plan activities is estimated at 5 hour minimum.

Action Plan Activity	Suggested
Module 1—Information in Society and the Classroom	**50 min**
Lesson 1—Activity 3: Critical Thinking	15 min
Lesson 2—Activity 4: Visual Representation	15 min
Lesson 3—Activity 2: Student-Centered Projects	15 min
Lesson 4—Activity 1: Module Summary	5 min
Module 2—Project Design for Critical Thinking	**65 min**
Lesson 1—Activity 3: Collaborative Projects	10 min
Lesson 2—Activity 2: Learning Objectives	10 min
Lesson 3—Activity 1: Assessment of Data Processes	20 min
Lesson 4—Activity 2: Online Data Sources	20 min
Lesson 5—Activity 1: Module Summary	5 min
Module 3—Skills for Thinking Critically with Data	**65 min**
Lesson 1—Activity 3: Strategies for Accuracy	15 min
Lesson 2—Activity 2: Patterns and Relationships	10 min
Lesson 3—Activity 2: Common Errors in Data Interpretation	20 min
Lesson 4—Activity 2: Research Cycle	15 min
Lesson 5—Activity 2: Module Summary	5 min
Module 4—Tools for Effective Data Analysis	**55 min**
Lesson 1—Activity 2: Data Organization	15 min
Lesson 2—Activity 3: Conceptual Data Displays	10 min
Lesson 3—Activity 2: Tools for Data Presentation	10 min
Lesson 4—Activity 2: Showing Evidence Examples (Optional)	15 min
Lesson 5—Activity 2: Module Summary	5 min
Module 5—Critical Thinking and Instruction	**50 min**
Lesson 1—Activity 5: Mini-Lessons and Critical Thinking	10 min
Lesson 2—Activity 2: Self-Direction	15 min
Lesson 3—Activity 1: Fieldwork	20 min
Lesson 4—Activity 1: Module Summary	5 min
Course Wrap-Up	**15 min**
Summary	15 min
Totals	**5 hr**

Discussion Suggestions

Online Group Discussions

Consider the following suggestions when engaging in an online group discussion:

- Ensure posts are substantive and advance or reframe a discussion
- Support comments with examples, experiences, or references
- To encourage responses to your entry, ask participants a question about the material you have posted or ask whether others agree or disagree with your thoughts and why
- Revisit the discussion regularly to review your entries and respond to other participants

Providing Constructive Feedback

Consider the following tips when providing feedback in an online or face-to-face discussion:

- Begin by giving positive feedback to establish a supportive tone
- Be clear and specific when providing suggestions
- Provide constructive feedback that is descriptive, rather than evaluative
- Provide examples and tips
- In an online environment, read posts out loud to make sure they are complete
- Ask for clarification to ensure that you understand what is being said
- Make neutral statements
- Focus on elements that the individual can change and that are relevant to the topic
- Provide feedback in a timely manner
- Limit feedback to two or three key comments
- For facilitators, remind participants that you are available to help them
- End with a motivational statement

Discussion Checklist

The Discussion Checklist can enhance participants' conversations. Tips for improving online interactions are included.

- ☐ My discussions reflect a deep understanding of the content through the use of detailed examples and comparisons.
- ☐ I make meaningful connections between the course content and classroom practice.
- ☐ I connect the topics I am learning about to broader issues and ideas.
- ☐ I take risks by sharing areas of confusion and concern.
- ☐ I respond to colleagues' comments and entries by asking questions, elaborating, paraphrasing, and extending their ideas.
- ☐ My writing is easy to understand.
- ☐ I follow online conventions for creating a positive and productive discussion environment.
- ☐ I respond to discussions early to encourage meaningful interaction.