Making Innovation Easier: What Do Questions Have to Do With It?

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RQI Right Question Institute

KEDC Kentucky Educational Development Corporation

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rightquestion.org

Today's Agenda

1) Why We Work on Questions
2) Collaborative Learning with the Question Formulation Technique (QFT)
3) Obstacles to Innovation
4) How Some Teachers Overcome the Obstacles: Classroom Examples
5) Beyond Google and in the Age of AI

Acknowledgements

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"There is no learning without having to pose a question."

- Richard Feynman

Nobel Laureate, Physics, 1965

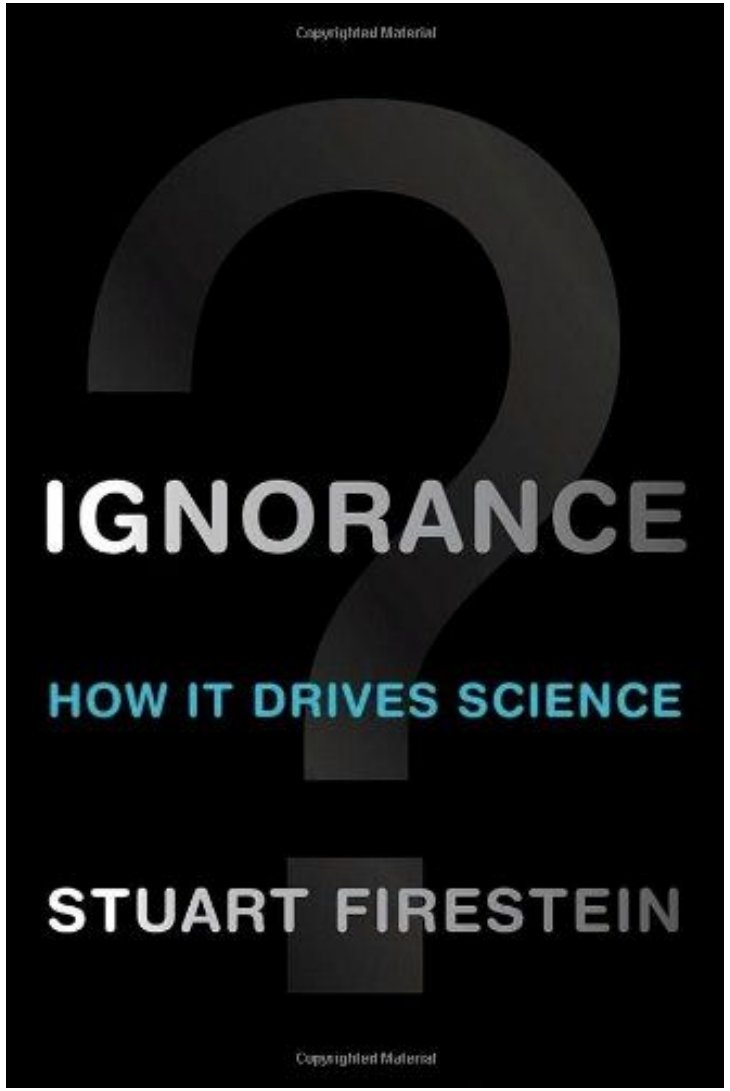
Seneca High School, Louisville, KY

My research question for 2 page paper for my 11th Grade U.S. History class with Ms. Lee James:

"*Was the American Revolution a...*

political, economic, social or cultural revolution?"

Why We Work on Questions



"We must teach students how to think in questions, how to manage ignorance."

– Stuart Firestein

Former chair, Department of Biology,
Columbia University

College Presidents on What College Students Should Learn in Four Years of College

"The primary skills should be analytical skills of interpretation and inquiry. In other words, know how to frame a question."

- Leon Botstein, President of Bard College

"…the best we can do for students is have them ask the right questions."

- Nancy Cantor, Former Chancellor of University of Illinois

The New York Times, August 4, 2002

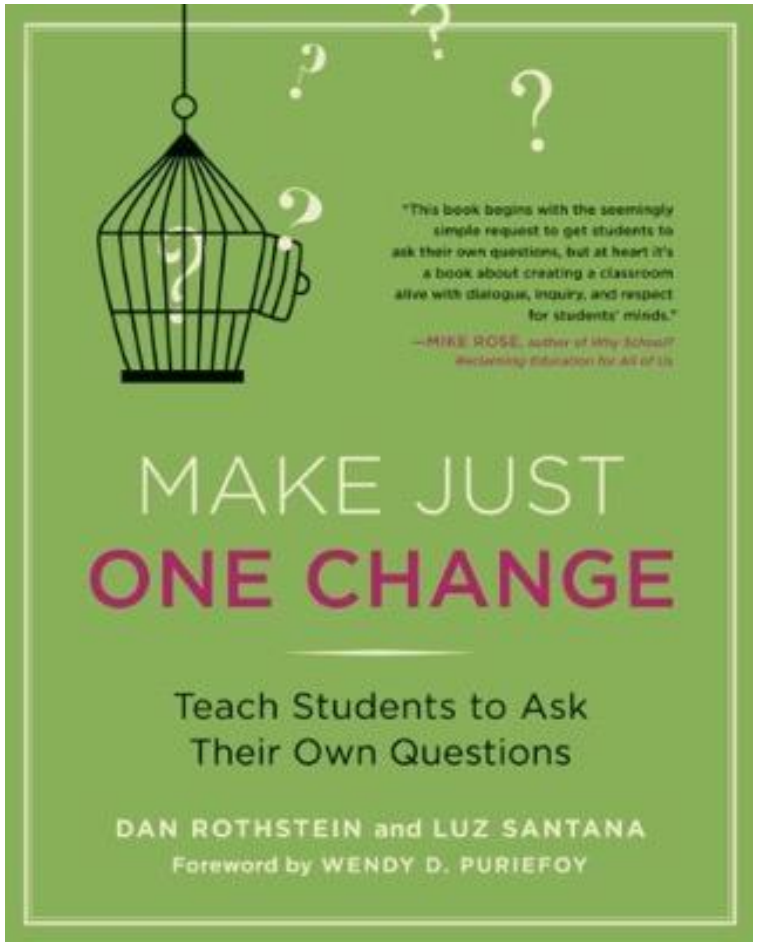
Honoring the Original Source: Parents in Lawrence, Massachusetts, 1990

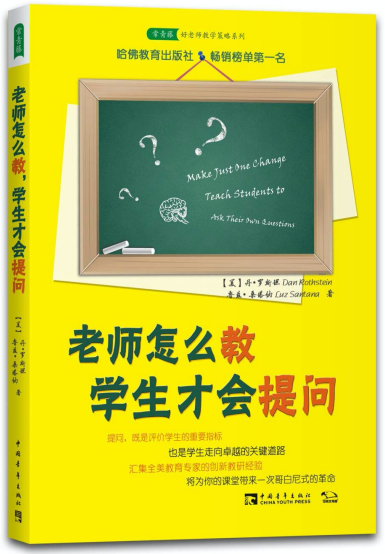
"We don't go to the school because we don't even know what to ask."

We can work together on making sure all students are asking questions

We are not alone

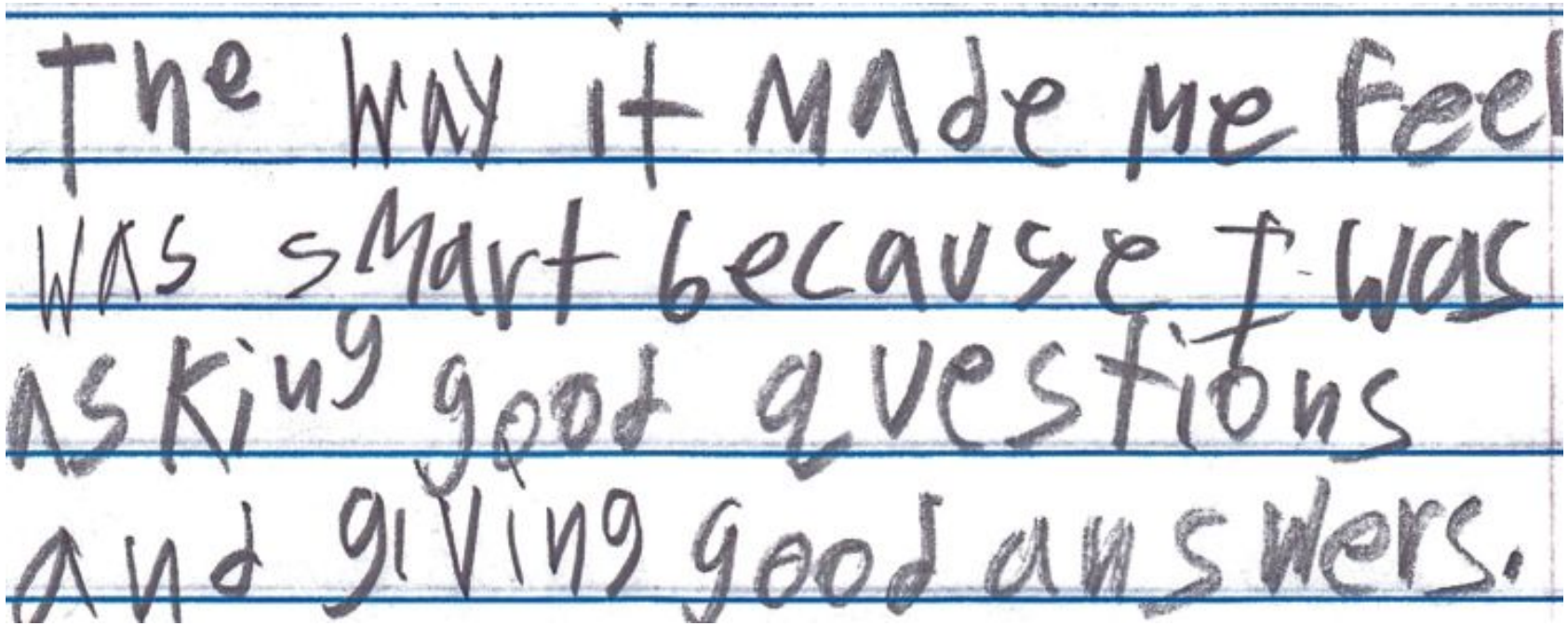
Now in more than 1 million classrooms worldwide





What happens when students do learn to ask their own questions?

Student Reflection



"The way it made me feel was smart because I was asking good questions and giving good answers."

- *Boston 9th grade summer school student*

Collaborative Learning with the Question Formulation Technique (QFT)

The Question Formulation Technique (QFT)

You learn to:

- **Produce** your own questions
- **Improve** your questions
- **Strategize** on how to use your questions
- **Reflect** on what you have learned and how you learned it

Rules for Producing Questions

1. Ask as many questions as you can
2. Do not stop to answer, judge, or discuss
3. Write down every question exactly as stated
4. Change any statements into questions

THINK: Which rule may be difficult for you to follow?

Produce Questions

Work with one or two people seated near you. One person will be the notetaker. You will:

1. Ask Questions
2. Follow the Rules
    - Ask as many questions as you can.
    - Do not stop to answer, judge, or discuss.
    - Write down every question exactly as it was stated.
    - Change any statements into questions.
3. Number the Questions

Question Focus

Some effective teaching practices do not get adopted.

Remember to **number** your questions and follow the rules:

Ask as many questions as you can.
Don't stop to answer, judge, or discuss.
Write down every question exactly as it was stated.
Change any statements into questions.

Categorize Questions: Closed/Open

Definitions:

- **Closed-ended** questions can be answered with a "yes" or "no" or with a **one-word** answer.
- **Open-ended** questions require more **explanation**.

Directions: Identify your questions as closed-ended or open-ended by **marking them** with a **"C"** or an **"O."**

Discuss

Quickly, in your group, name:

a. 2 advantages to closed-ended questions
b. 2 disadvantages to closed-ended questions
c. 2 advantages to open-ended questions
d. 2 disadvantages to open-ended questions

Both Closed and Open Questions Are Good!

Closed-Ended Questions

- clarify and build context
- can be effective follow up questions
- useful for data collection and testing hypotheses
- crucial for self-advocacy and holding decision makers accountable

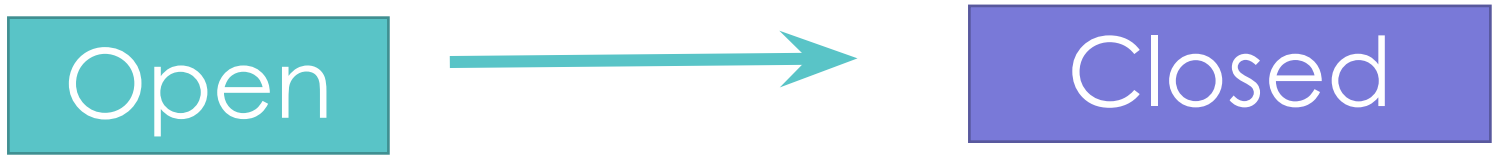
Open-Ended Questions

- encourage discussion & multiple perspectives
- have many possible “right” answers
- can build empathy and active listening

Improve Questions

- Take one **closed-ended question** and change it into an **open-ended question**.

- Take one **open-ended question** and change it into a **closed-ended question**.



- Add these as new questions to the bottom of your list.

Prioritize Questions

Review your list of questions, then:

- Star 3 questions **you are most curious about**.

- Discuss why you chose those questions.

Share

Please share any **ONE of your group's priority questions** using a tool called Mentimeter:

Use the QR code

or go to Menti.com and enter the code:
6188 5103

Reflect

- What did you learn?
- How did you learn it?

Please share a response on MENTIMETER:

Use the QR code

or go to Menti.com and enter the code:
6188 5103

A Look Inside the QFT Process

The QFT, on one slide…

1) Question Focus
2) **Produce** Your Questions
   - ✔ Follow the rules
   - ✔ Number your questions

1. Ask as many questions as you can
2. Do not stop to discuss, judge or answer
3. Record *exactly* as stated
4. Change statements into questions

3) **Improve** Your Questions
   - ✔ Categorize questions as Closed or Open-ended
   - ✔ Change questions from one type to another
4) **Strategize**
   - ✔ Prioritize your questions
   - ✔ Action plan or discuss next steps
   - ✔ Share
5) **Reflect**

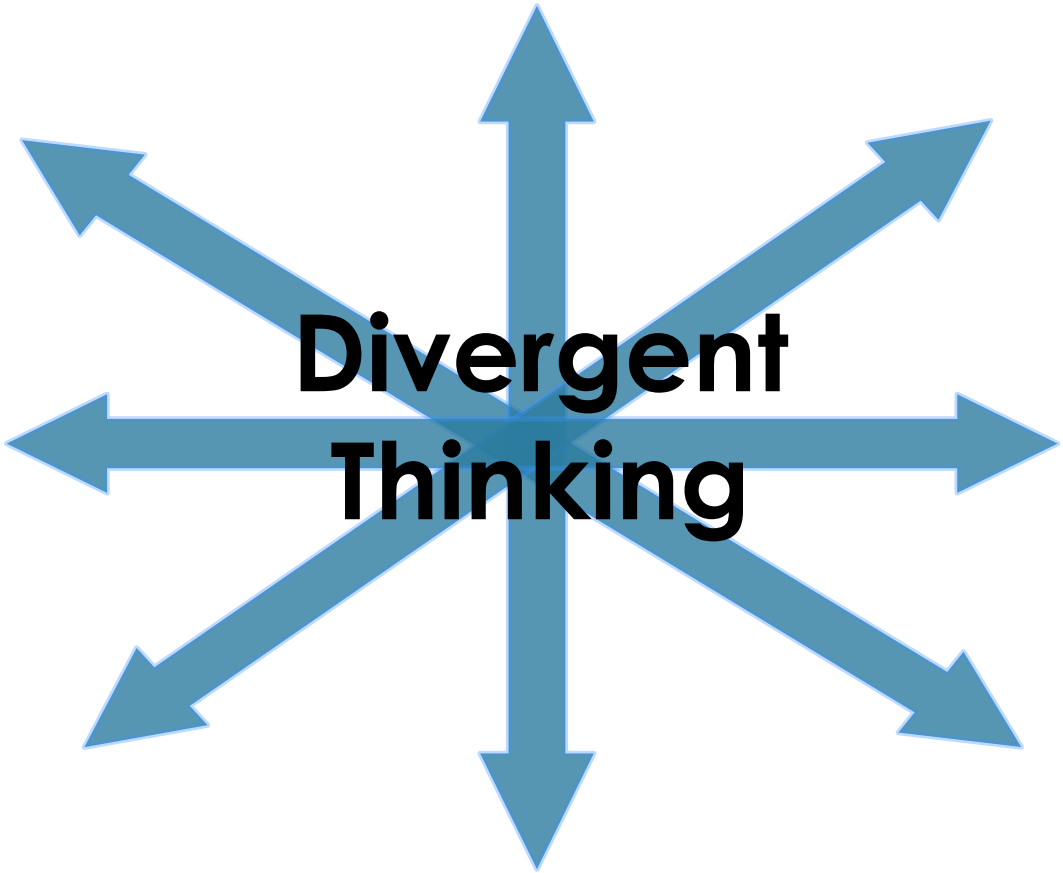
Closed-Ended: Answered with "yes," "no" or one word

Open-Ended: Require longer explanation

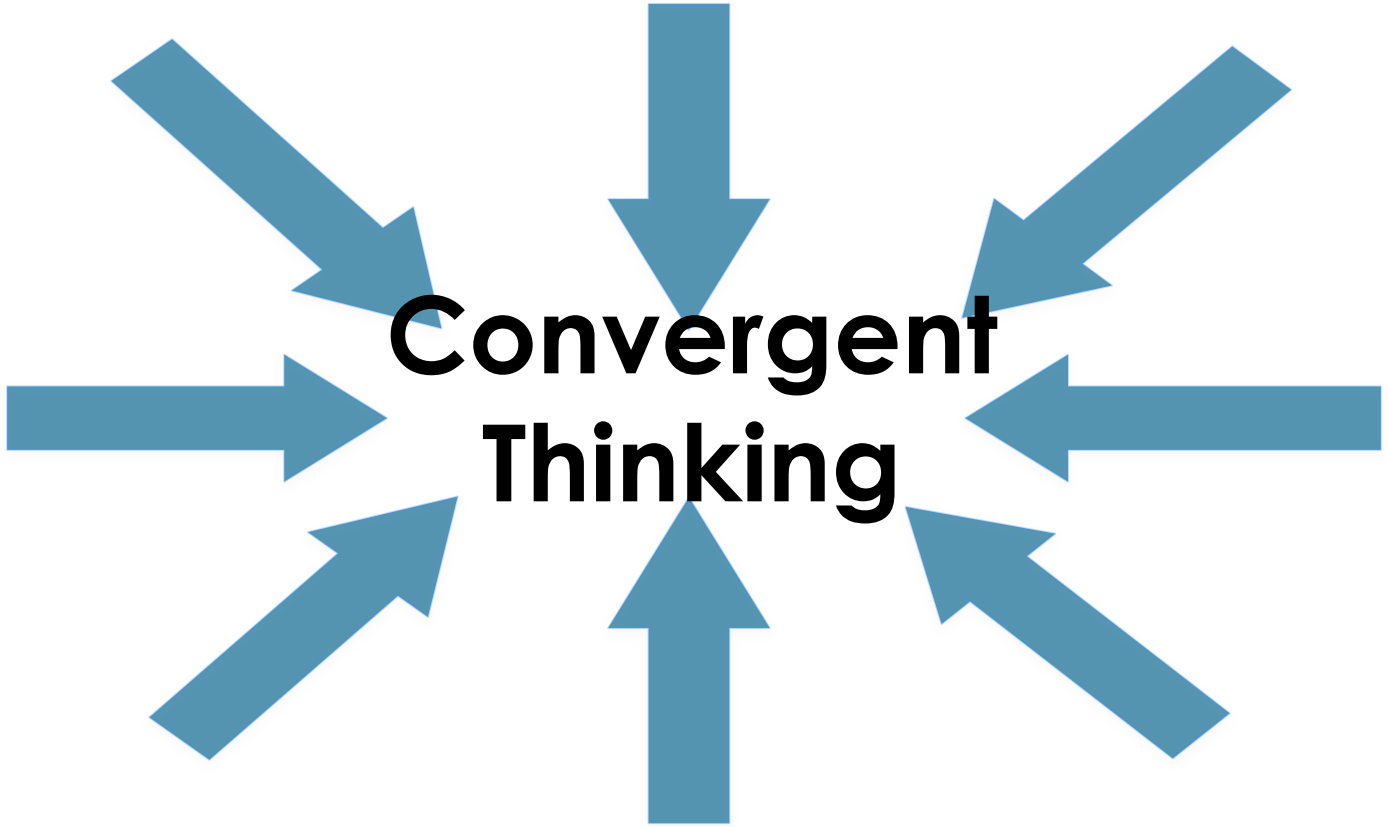
Source: The Right Question Institute rightquestion.org

Three thinking abilities with one process

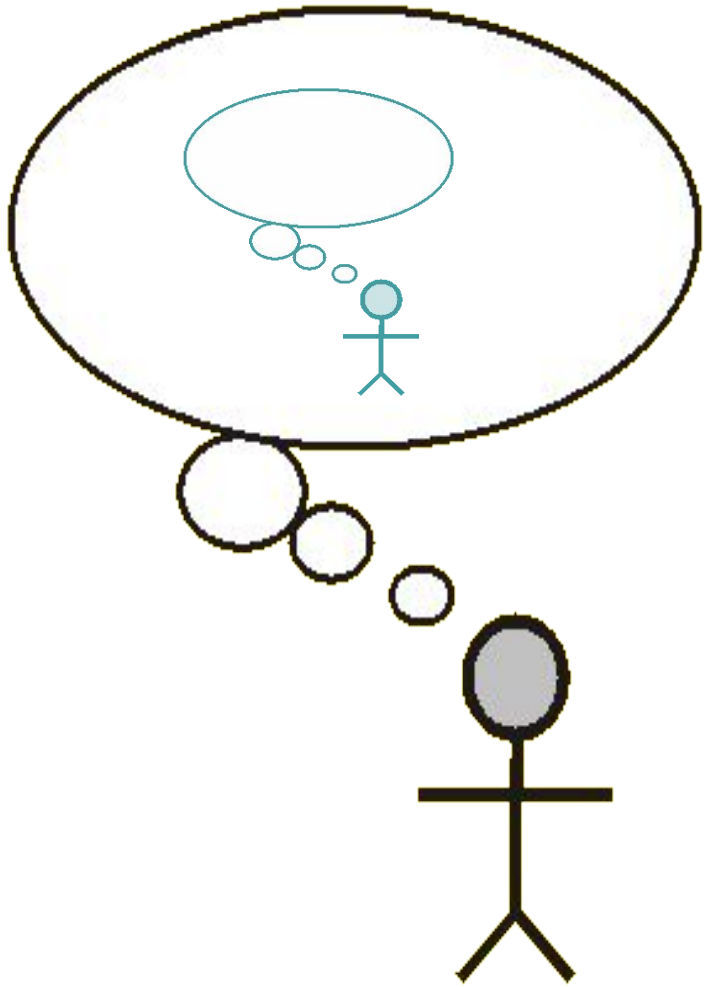
Thinking in many different directions



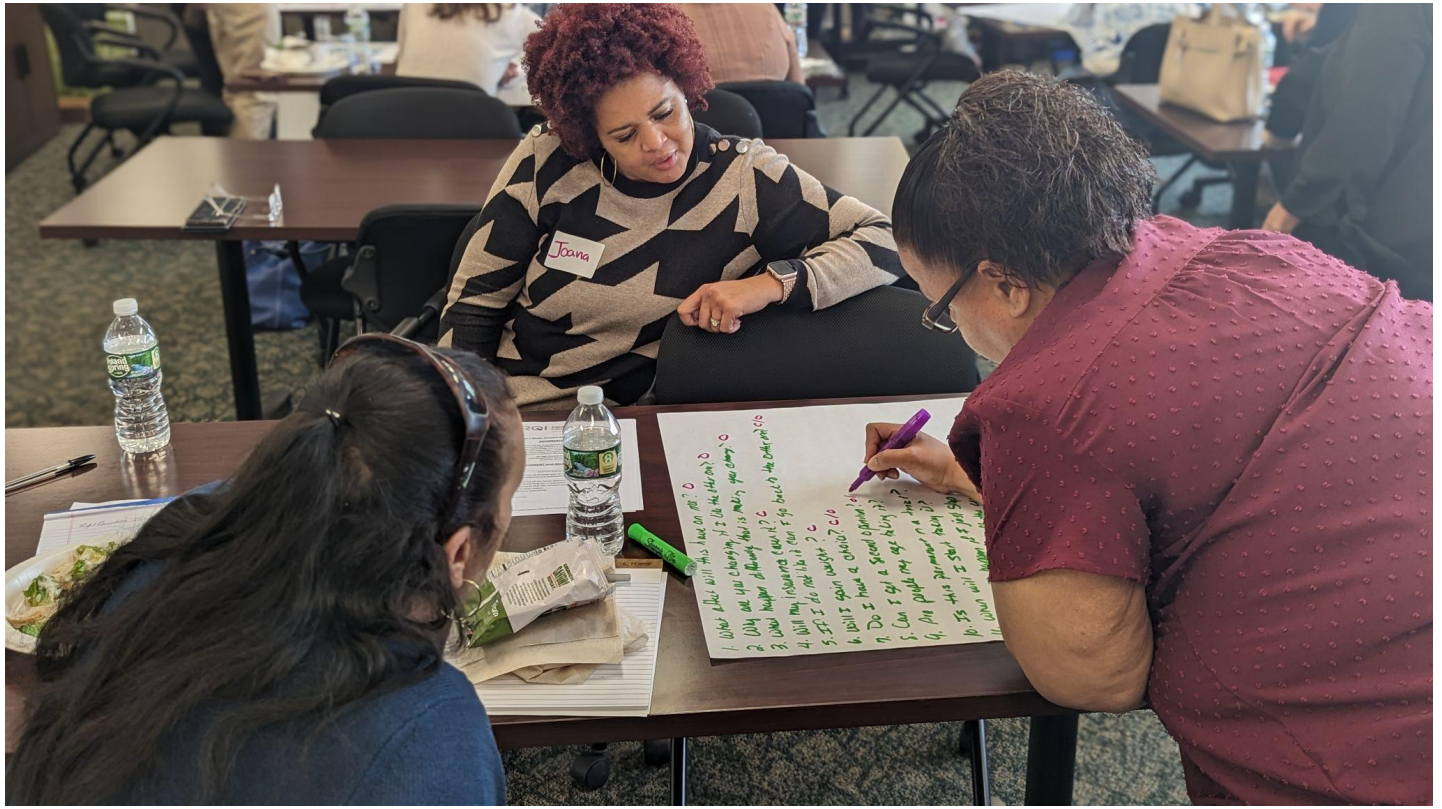
Narrowing Down, Focusing



Thinking about Thinking



Metacognition



Obstacles to Innovation

Question Formulation

The ability to formulate one's own questions is a fundamental skill, essential for:

- Better thinking, learning, and research
- Effective advocacy, participation, and holding decision-makers accountable
- Democracy

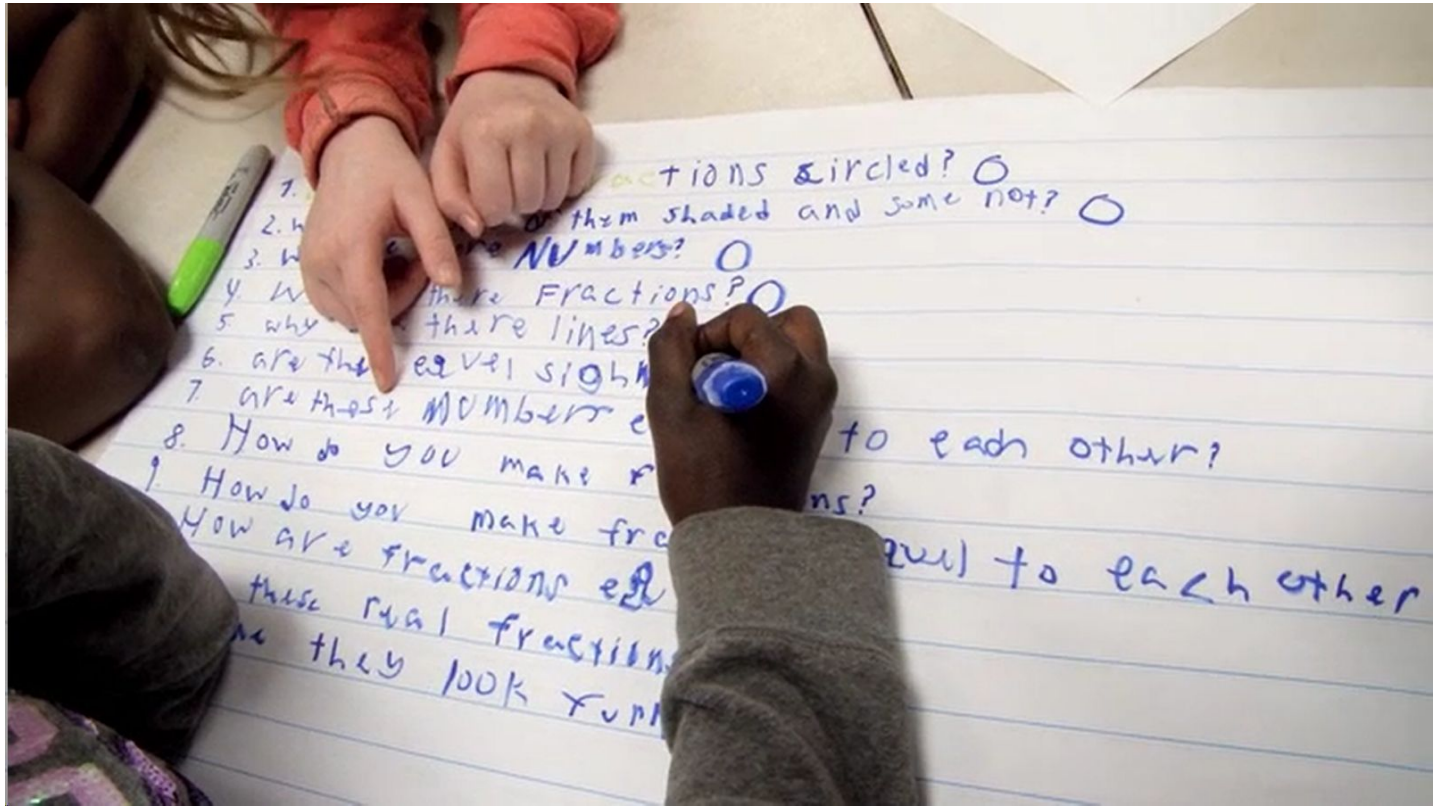
Yet the skill of question formulation is not deliberately taught

Obstacles to Adoption

1. Requires recognizing the profound importance of developing a skill of question formulation
2. The skill of question formulation may be valued but dedicating time to teach it is not a priority.
3. Involves a small but very significant shift in practice and requires learning an additional model of educational design and planning

How Can We Overcome Resistance to Adoption?

1. Respect and believe in the ability, idealism, dedication and willingness of people in the field to make change happen.
2. Find "early adopters" (Rogers, 1971) who can help overcome others' resistance.
3. Listen to the field and simplify, simplify, simplify.



How Some Teachers Overcome the Obstacles: Classroom Examples

Classroom Example: 4th Grade

Teacher: Deirdre Brotherson, Hooksett, NH

Topic: Math unit on variables

Purpose: To engage students at the start of a unit on variables and assess their current skill level

Question Focus

$$24 = ☺ + ☺ + ☺$$

Student Questions

1. Why is the 24 first?
2. What do the smiley faces mean?
3. **Why are there 3 smiley faces?**
4. How am I suppose to figure this out?
5. Is the answer 12?
6. Can I put any number for a smiley face?
7. **Do three faces mean something?**
8. **Do the numbers have to be the same because the smiley faces are the same?**
9. What numbers will work here?
10. Does it mean 24 is a really happy number?
11. **Can we replace each smiley face with an 8?**
12. Do any other numbers work?
13. Can we do this for any number?
14. **Does it always have to be smiley faces?**
15. **Do we always have to use three things?**

Next Steps with Student Questions

- Posters of students' questions were displayed on walls around the room
- As students learned more about variables, they went up to the wall to cross off questions they had answered
- At the end of the unit, students discussed what they had learned and what questions they now had

Classroom Example: 5th Grade

Teacher: Tiffany Gruen, Erlanger, KY

Topic: The Boston Massacre

Purpose: To preview a significant historical event that will appear halfway through the unit; to question its causes and effects

Question Focus

https://www.loc.gov/resource/ppmsca.01657/

Next Steps with Student Questions

- The teacher integrated student questions into the unit
- Students learned to build evidence for both sides using court transcripts from the case that followed the Massacre
- Students engaged in a debate using the evidence they had pulled

Classroom Example: 5th Grade

Teacher: Shana Trimble, Paintsville, KY

Topic: Westward Expansion

Purpose: To closely observe and analyze themes in a historical painting

Question Focus

This is a 1873 painting by John Gast:

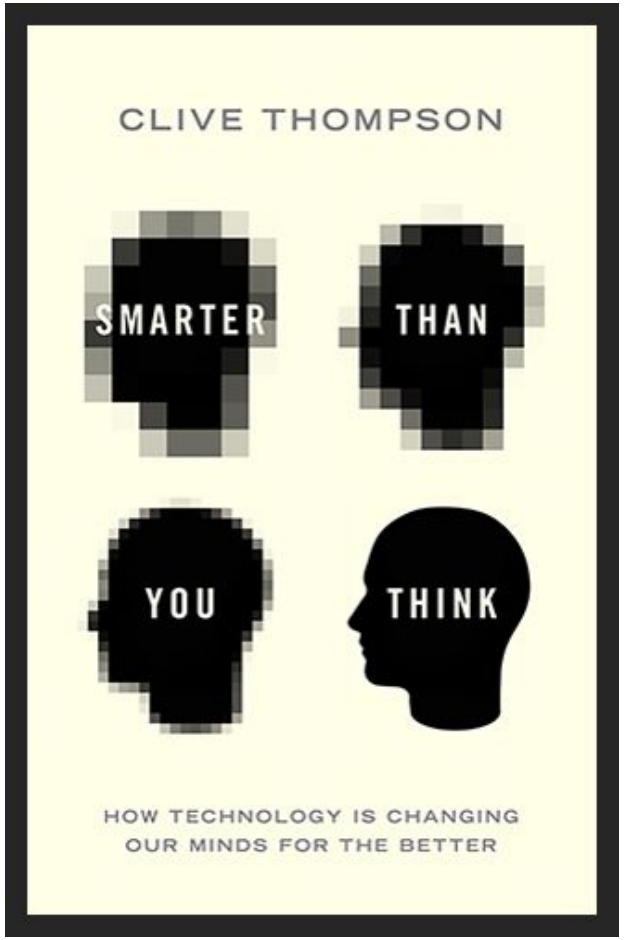
https://www.loc.gov/item/97507547/

Student Questions

1. **Where is the setting of this painting?**
2. **Are these good or bad people?**
3. Are they running from something or to something?
4. What are the trains carrying?
5. Why is she holding a string?
6. Why is everyone going in the same direction?
7. What are the lines she is carrying in her arms?
8. **Why are the Indians running?**
9. How many people are in the picture?
10. **Are the strings the woman is holding telephone lines?**
11. **Do the trains in the background represent new technology?**
12. ***What does the lady in white represent?***
13. **Are the white men pushing the Native Americans out of their territory?**
14. **Where are they going?**

Why is the skill of question formulation so important now?

Beyond Google and in the Age of AI



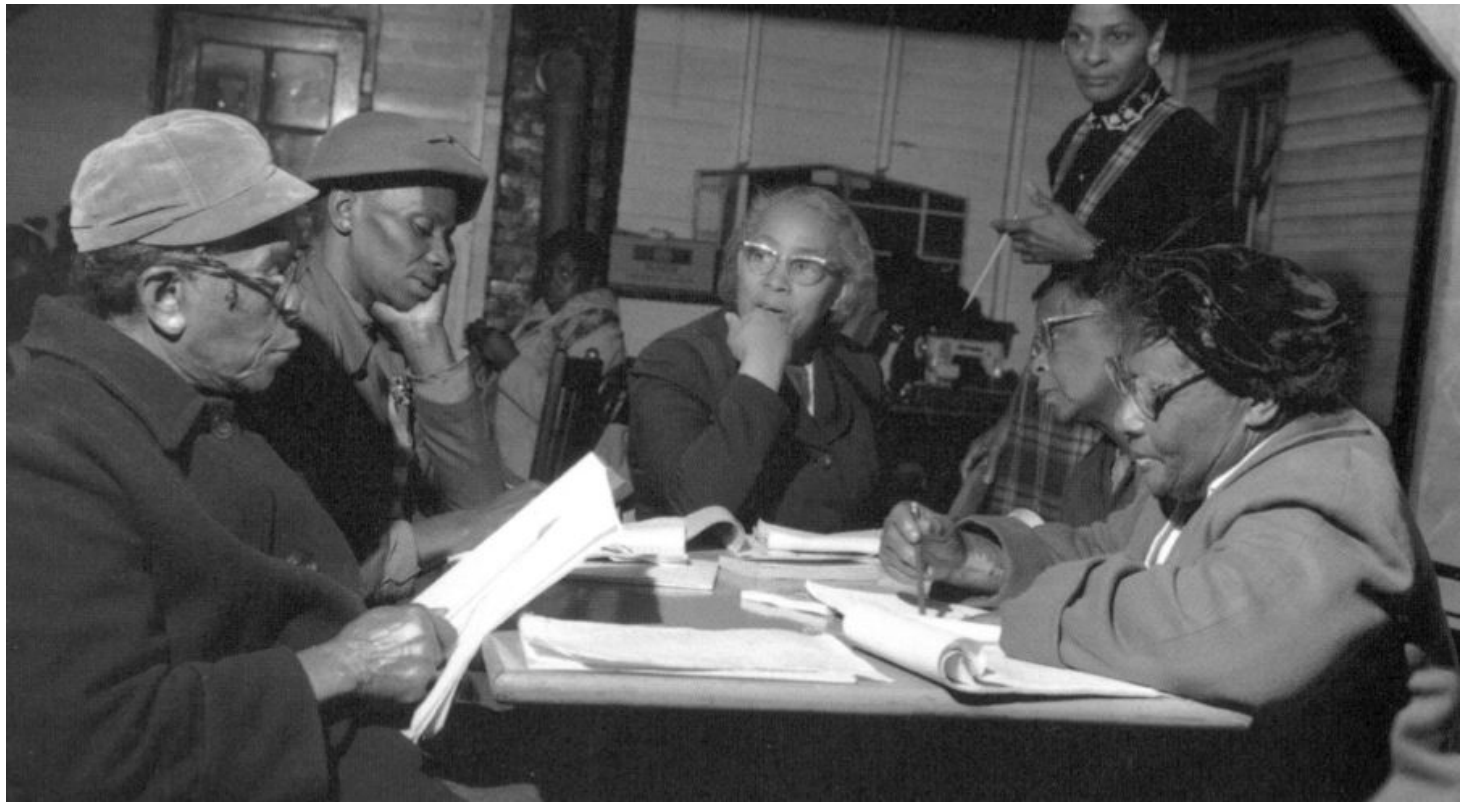
"How should you respond when you get powerful new tools for finding answers?

Think of harder questions."

– Clive Thompson

Journalist and Technology Blogger

Questions and Democracy



"I believe unconditionally in the ability of people to respond when they are told the truth. We need to be taught to study rather than to believe, to **inquire** rather than to affirm."

– Septima Clark

Chapter 6 on Septima Clark in Freedom Road: Adult Education of African Americans (Peterson, 1996)

Theory of Question Formulation for Learning

QUESTION FORMULATION

RQI's definition:

"Generate questions divergently and then work to improve them through convergent and metacognitive thinking"

Engagement

- Focused
- Interested
- Curious
- Joyful
- Autonomous
- Personalized learning agenda

Comprehension

- Activate prior knowledge
- Make connections and meaning
- Assess information
- Gain new knowledge

Discovery

- Generate new questions
- Confirm or challenge assumptions
- Create and explore ideas
- Hypothesize
- Problem-name

Motivated Learners

- Purposeful
- Committed
- Persistent
- Self-directed

Nimble Thinkers

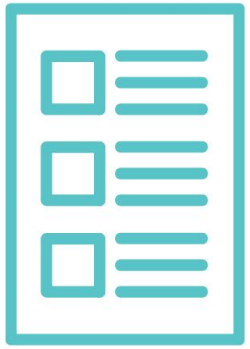
- Flexible
- Analytic
- Agile
- Independent

Find Today's Materials

Today's materials:
https://tinyurl.com/RQIatJuneKEDC

Access RQI's Free QFT Resources

https://rightquestion.org/education/resources



Classroom Examples

Instructional Videos

Planning Tools & Templates

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Student Questions and Reflections Using the QFT