Argument Mapping to Enhance Critical Thinking

Introductions

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Critical Thinking and You

Introduction to Argument Mapping

Practice Argument Mapping

Applications of Argument Mapping
Critical Thinking and You

Critical thinking is "purposeful, reflective judgment which manifests itself in reasoned consideration of evidence, context, methods, standards, and conceptualizations in deciding what to believe or what to do."


What are your experiences with critical thinking in your classroom?
Critical Thinking and You

Introduction to Argument Mapping
How can we help our students to reason better? What methodology should we employ? Well, first of all, understanding and evaluating reasoning requires grasping the relationships between the ideas that make up the reasoning, and graphical representations make these relationships between ideas easier to see. It follows from this that representing other people’s reasoning in graphical form makes that reasoning easier to understand and evaluate. Additionally, representing our own reasoning graphically helps us to construct better arguments because it allows us to track our own reasoning more clearly. It follows from this that we should teach students how to graphically represent reasoning. Of course, there are two common objections to this approach: the claim that learning how to graphically represent reasoning is hard and the concern that teaching graphical representation takes valuable time away from class content. Neither of these objections is successful. Learning how to graphically represent reasoning isn’t as difficult as many people think, and even if it were, we are often justified in teaching students things that are difficult to learn. Furthermore, it’s a mistake to think that teaching graphical representation takes time away from class content because content can be taught through the graphical representation of reasoning and because instructors can decide to focus upon a small set of skills related to graphical representation.
How can we help our students to reason better? What methodology should we employ? Well, first of all, understanding and evaluating reasoning requires grasping the relationships between the ideas that make up the reasoning, and graphical representations make these relationships between ideas easier to see. It follows from this that representing other people’s reasoning in graphical form makes that reasoning easier to understand and evaluate. Additionally, representing our own reasoning graphically helps us to construct better arguments because it allows us to track our own reasoning more clearly. It follows from this that we should teach students how to graphically represent reasoning. Of course, there are two common objections to this approach: the claim that learning how to graphically represent reasoning is hard and the concern that teaching graphical representation takes valuable time away from class content. Neither of these objections is successful. Learning how to graphically represent reasoning isn’t as difficult as many people think, and even if it were, we are often justified in teaching students things that are difficult to learn. Furthermore, it’s a mistake to think that teaching graphical representation takes time away from class content because content can be taught through the graphical representation of reasoning and because instructors can decide to focus upon a small set of skills related to graphical representation.
Way to evaluate each idea

Role of each idea

Relationship between ideas
Support Relationship

Dependence Relationship

Independence Relationship

Objection Relationship
We should teach students how to graphically represent reasoning.

Sub Conclusion:
- Representing our own reasoning graphically helps us to construct better arguments.
- Representing our own reasoning graphically allows us to track our reasoning more clearly.

Objection:
- Learning how to graphically represent reasoning is hard.
- Teaching graphical representation takes valuable time away from class content.

Rebuttal:
- Learning how to graphically represent reasoning isn't as difficult as many people think.
- Instructors can decide to focus upon a small set of skills related to graphical representation.
Has the argument given us to reason to believe this?

Is this true?

Is this inference strong?
An objection to the idea

We should teach students how to graphically represent reasoning

Relationship between ideas
Role of each idea
Way to evaluate each idea

Representing other people's reasoning in graphical form makes reasoning easier to understand and evaluate.

Representing our own reasoning graphically helps us to construct better arguments.

Learning how to graphically represent reasoning is hard.

Teaching graphical representation takes valuable time away from class content.

Understanding and evaluating reasoning requires grasping the relationships between the ideas that make up the reasoning.

Graphical representations make these relationships between ideas easier to see.

Representing our own reasoning graphically allows us to track our reasoning more clearly.

Learning how to graphically represent reasoning isn't as difficult as many people think.

We are often justified in requiring students to learn difficult things.

An objection to the connection

An objection to the idea
An objection to the connection is an objection to a hidden assumption.
Uncovering Hidden Assumptions

... A ... C ...

... A ... B ...

If B then C
We shouldn’t teach students how to graphically represent reasoning.

Learning how to graphically represent reasoning is hard.
We shouldn’t teach students how to graphically represent reasoning.

Learning how to graphically represent reasoning is hard.

If learning is hard then we shouldn’t teach students.
We shouldn’t teach students how to graphically represent reasoning.

Learning how to graphically represent reasoning is hard.

If something is hard to learn then we shouldn’t teach it to students.
Critical Thinking and You

Introduction to Argument Mapping

Practice Argument Mapping
1) I can't do everything that my neighbors can because last week they installed their own siding on their house!
2) I can't do everything that my neighbors can. Last week they installed their own siding on their house and they are able to communicate telepathically.

I can't do everything that my neighbors can.

- Last week, my neighbors installed their own siding on the house.
- My neighbors are able to communicate telepathically.
3) Since my neighbors are extra-terrestrials and extra-terrestrials are able to communicate telepathically, it means that my neighbors are able to communicate telepathically.
4) My neighbors are extra-terrestrials, so they can communicate telepathically.

My neighbors are able to communicate telepathically.

My neighbors are extra-terrestrials.
5) I know that my neighbors are extra-terrestrials because I have seen them watching the stars in their backyard.

My neighbors are extra-terrestrials.

I have seen my neighbors watching the stars in their backyard.
6) I know that my neighbors are extra-terrestrials because I have seen them watching the stars in their backyard. My sister says that they're admiring the clouds, but you can't see clouds when it's dark.
7) I know that my neighbors are extra-terrestrials because I have seen them watching the stars in their backyard. My husband thinks that they are amateur astronomers, but they aren't even using telescopes.

My neighbors are extra-terrestrials.

I have seen my neighbors watching the stars in their backyard.

If my neighbors are watching the stars then they are extra-terrestrials.

My neighbors are amateur astronomers.

My neighbors aren't using telescopes.
8) I can't do everything that my neighbors can. Last week they installed their own siding on their house, and they are able to communicate telepathically because they are extra-terrestrials. I know that because I've seen them watching the stars in their backyard.
9) I can't do everything that my neighbors can. Last week they installed their own siding on their house, and they are able to communicate telepathically because they are extra-terrestrials. I know that because I've seen them watching the stars in their backyard. My sister says that they're admiring the cloud, but you can't see clouds when it's dark. My husband thinks that they are amateur astronomers, but they aren't even using telescopes.
10) “I think my house will sell within six months. It’s priced reasonably (even though my nasty neighbor thinks that it’s priced twice as high as comparable houses) and reasonably priced houses always sell quickly. Besides that, it’s on a river. Of course, lots of people are worried about flooding. My husband claims that our house needs a new roof and that houses that need new roofs stay on the market longer, but as far as I can see, our roof is structurally sound.”
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What are your experiences with critical thinking in your classroom?

How do you think you might apply this in your classroom?
• Recognizing the claims and the relationships between the claims

• Asking appropriate, role-specific, questions about the claims

• Reasoning from evidence to a conclusion or attempting to support a conclusion with evidence

• Transposing the map into text

• Tracking the reasoning as it occurs
• MindMup https://www.mindmup.com/
• bCisive https://www.bcisiveonline.com/
• Rationale https://www.rationaleonline.com/
• TruthMapping https://www.truthmapping.com/#cat=3
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Practice

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