

## Grasping Evidence with EDDiE: A CSCL Tool to Support Collaborative Reasoning about Disagreements in Multiple Documents

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**Abstract:** We have developed and investigated a web-based CSCL system to support students as they analyze multiple controversial documents. The application, “EDDiE” (Electronic Documents Disagreements Evaluation), allows students to interactively create a visual representation of information from multiple conflicting documents in order to resolve disagreements among the documents. The design is based on the Grasp of Evidence (GoE) Framework (Duncan et al., 2018). Using EDDiE, students collaboratively analyze and compare the quantity and quality of evidence (including testimony by knowledgeable sources) for different claims. In a preliminary study, EDDiE’s epistemic scaffolds promoted productive epistemic discourse.

### Introduction

Citizens in the 21st century find it challenging to make sense of the rampantly conflicting information they encounter (Barzilai & Chinn, 2020; Chinn et al., 2020). People must learn to resolve the widespread conflicts and disagreements in digital media. Thus, recent scholarship has made increasing efforts to help people deal with conflicting information and disagreements across multiple sources (e.g., Barzilai et al., 2020a; 2020b). Effective integration across documents requires reasoners to use competent strategies both to identify and explain the disagreements that exist (Thomm et al., 2016) and to resolve these disagreements.

This poster paper describes the design of a CSCL system, referred to as EDDiE (Electronic Documents Disagreements Evaluation), a multi-user, interactive web application. Users collaboratively read a set of multiple documents and create a visual graphic organizer to synthesize information as well as analyze and resolve disagreements. In a preliminary efficacy trial, EDDiE’s epistemic scaffolds promoted productive epistemic discourse directed at disagreement resolution; details of the results are not included in this paper due to its brevity.

### Epistemic scaffolds designed and implemented in the web-based CSCL

The epistemic scaffolds of EDDiE (Figure 1) are grounded theoretically in the Grasp of Evidence (GoE) framework (Duncan et al., 2018). EDDiE encourages students to resolve disagreements by engaging systematically in five evidential practices identified by the GoE framework. The graphical elements invite students to participate in productive discussions regarding each document’s evaluation, the quality and strength of evidence (including empirical evidence described in the documents, the evidence of testimony by experts, etc.), the relationships between evidence and positions, what the disagreements are, and how to resolve them. In short, EDDiE aims to promote collaborative discussions about how evidence can be used to resolve disagreements.

The GoE framework posits five dimensions of evidence evaluation. Below, we describe each, explain how EDDiE scaffolds each, and explain how these scaffolds can promote productive epistemic discourse.

- **Evidence analysis** (understanding the components of empirical studies and how they fit together). Students record important elements of evidence (e.g., sample size, critical comparisons, results) in the tableau. *Epistemic discourse: They discuss the study details as they compare and evaluate studies across documents, analyzing differences between studies as potential reasons for disagreements.*
- **Evidence evaluation** (determining if evidence is of high methodological quality). Students denote the quality of evidence via *color* of evidence circles in the tableau. *Epistemic discourse: Students evaluate methodological processes (e.g., appropriate sample size, proper controls, etc.); they may conclude that some lower-quality studies should be weighted less.*
- **Evidence interpretation** (determining how strong evidence is in supporting or weighing against explanations). The thickness of arrows between evidence and claims reflect evidence strength in supporting or opposing various claims. Dotted arrows mark disagreements. *Epistemic discourse: Students discuss what the evidence shows, how relevant it is, how diagnostic it is, how directly it supports claims, etc.*

These deliberations can also illuminate which positions are best supported by the available evidence.

- **Evidence integration** (determining the extent to which larger bodies of evidence support or weigh against theoretical claims). *The size and shape of evidence circles mark evidence quantity.* Larger ovals denote more evidence; smaller circles denote less evidence. *Epistemic discourse: Students discuss issues such as how much evidence there is for each position, whether there are multiple lines of evidence for different positions, the degree to which the evidence is consistent, etc.*
- **Lay use of evidence** (determining the credibility of scientific claims in everyday communication, such as the trustworthiness of sources, consensus among experts, and cross validation by knowledgeable others). *The knowledgeable supporters circles and arrows (size and color of circles, boldness of arrows) reflect lay evaluation of quality and consensus of knowledgeable others.* *Epistemic discourse: Students discuss the extent to which the sources are competent, biased or unbiased, in consensus, and so on.*

In short, we expected the scaffolds to support students in addressing and potentially resolving disagreements through systematic engagement with evidence along these five dimensions.

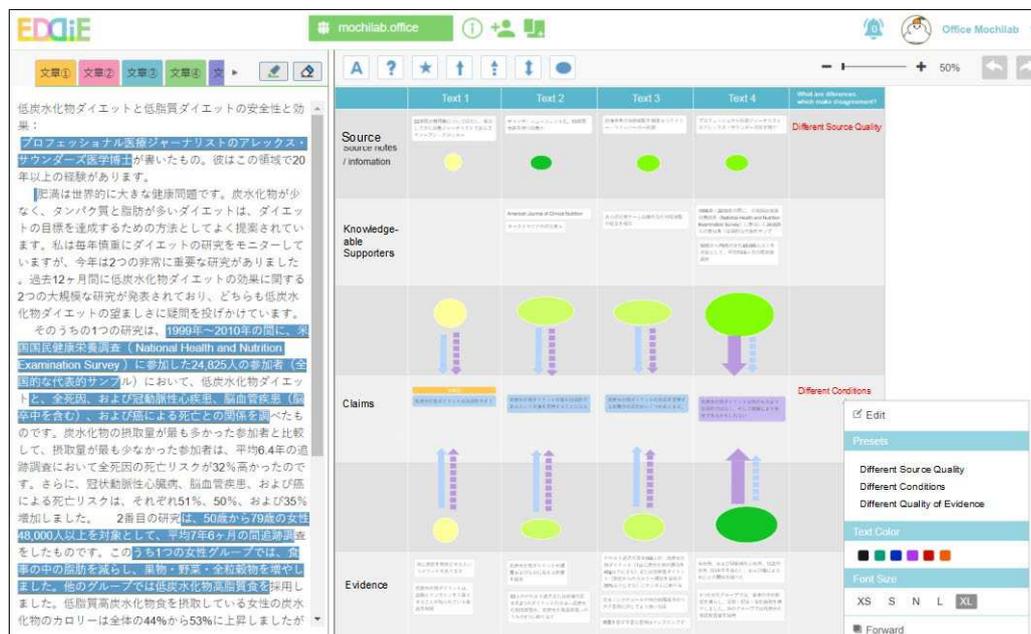


Figure 1. EDDiE's interface and functions

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