

Enhancing Students' Comprehension and Critical-Analytic Thinking Through Quality Talk Discussions

P. Karen Murphy¹, Jeffrey A. Greene², Carla Marie Firetto¹, Brendan Hendrick², Cristin Montalbano², Mengyi Li¹, Liwei Wei¹
¹The Pennsylvania State University, ²The University of North Carolina – Chapel Hill

ABSTRACT

Students often struggle to comprehend complex text. In response, we conducted a year-long study of Quality Talk (QT), a teacher-facilitated, small-group discussion approach designed to enhance students' high-level comprehension, in two fourth-grade classrooms. Specifically, teachers delivered instructional mini-lessons on discourse elements (e.g., questioning or argumentation) and conducted weekly text-based discussions in their language arts classes. Analysis of the videorecorded discussions showed decreases in teacher-initiated discourse elements indicating a release of responsibility to students, while students' discourse reflected increased critical-analytic thinking and epistemic cognition (e.g., elaborated explanations or exploratory talk). Importantly, statistically and practically significant increases were evidenced on measures of students' text comprehension and transfer to written argumentation, providing support for the efficacy of QT.

INTRODUCTION

- Students routinely struggle to comprehend complex text as evidenced by challenges with identifying information (e.g., main idea), making inferences, examining arguments, or vetting sources (e.g., National Center for Education Statistics, 2013).
- The Quality Talk approach is premised on the belief that talk is a tool for thinking and the belief that QT discourse can promote high-level comprehension and written argumentation.

RESEARCH QUESTIONS

- To what extent do teachers release control to students after participating in QT professional development and coaching, as evidenced by changes over time in the frequency of various teacher-initiated discourse elements in their discussions?
- To what extent does students' critical-analytic thinking and epistemic cognition change, as evidenced by student-initiated discourse elements when participating in QT after mini-lessons targeting those key elements as well as from baseline to post-intervention?
- How does student performance on text comprehension measures change over the course of the QT intervention?
- How does student performance on written argumentation measures change over the course of the QT intervention?

METHOD

Participants and Design

Participants

- two fourth-grade classrooms
- 35 students (predominantly Caucasian)

Design

- a single-group, time-series design
- Quality Talk intervention for one year

Intervention

Professional Development



Quality Talk Mini-Lessons



Quality Talk Discussions



Literacy Journal



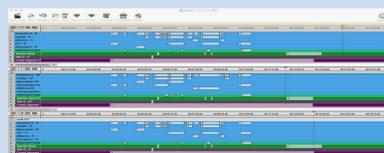
Measures

1. Oral Reading Fluency



2. Discourse Elements

- Middle 10-minute segment of each discussion was coded
- Both teacher- and student-initiated discourse elements were coded



3. Text Comprehension

- Two selected-response questions (required simple inferences)
- Three constructed-response items (required complex inferences)
- Administered after the QT discussion

Number: _____ Grade 5 Unit 3 The Dinosaurs of Waterhouse Hawkins Name: _____

Part One: Multiple Choice
 Directions: Circle the best answer.

- Why did Waterhouse choose to pursue his career?
 - He was inspired by a fossil he found in his backyard.
 - As a child, Waterhouse was excited by drawing animals.
 - Waterhouse always loved to be in the forest when he was young.
 - Waterhouse's family was poor, so he wanted to be a famous artist.
- How did the crowds react to Waterhouse's models?
 - angry at how much money he spent
 - boored because there were so many dinosaurs
 - sad because Waterhouse was retiring
 - amazed to see what a dinosaur looked like

Part Two: Short Answer Questions
 Directions: Answer the questions and support your answers with details from the text.

- How did Waterhouse design and build the models?

- Why was it important to Waterhouse that his models were perfect?

- Why did Waterhouse host a fancy party to show the scientists his models?

4. Written Argumentation

- Argumentation prompt for each text in the literacy journal
- Asked students to consider and weigh at least two positions
- Required students to critique/evaluate
- Completed after the QT discussion

Unit 3/Week 3: The Dinosaurs of Waterhouse Hawkins Date: _____

Writing

To receive full credit for your journal response, you must:

- Write the prompt in your writing
- Use evidence from the text
- Write each paragraph
- Have 3-4 sentences in each paragraph
- Use good 4th-grade sentences
- Check spelling and grammar

Question: Who do you think Waterhouse should have tried to impress more, the Queen or the scientists? Provide reasons and evidence to support your answer.

RESULTS

RQ1: Teacher-Initiated Discourse

Teacher talk shifted towards more authentic questions than test questions and fewer teacher moves overall.

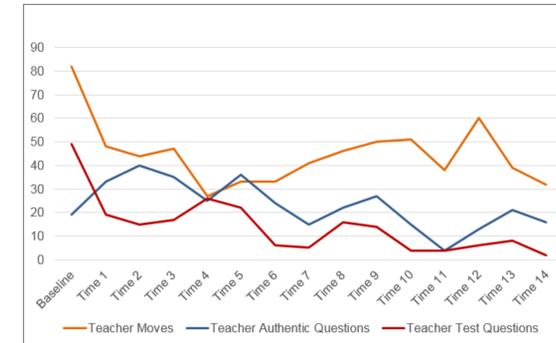


Figure 1. Frequencies of teacher authentic questions, test questions, and teacher moves by time point

RQ2: Student-Initiated Discourse

Student talk changed with an increase in authentic questions, few test questions overall, and notable increases in elaborated explanation and exploratory talk.

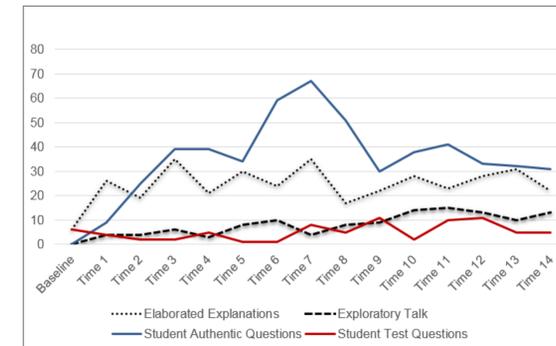


Figure 2. Frequencies of student authentic questions, test questions, elaborated explanations, and exploratory talk by time point

RQ3: Students' Text Comprehension

On average, students' text comprehension improved over the course of the QT intervention (Cohen's $d = 1.25$).

Table 1

Multilevel Models for Comprehension Outcome

Variable	Model1		Model2		Model3		Model4		Model5	
	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE
Fixed Effects										
Intercept	5.22***	.12	4.26***	.15	3.94***	.18	3.10***	.39	2.94***	.44
Growth Rate			.21***	.02	.21***	.02	.21***	.02	.21***	.02
Gender					.59**	.21			.54*	.20
AIMS							.008**	.004	.007*	.003
Random Effects										
Intercept	.33***	.03	.37***	.03	.29***	.03	.31***	.03	.25***	.03
Within Student	1.49		1.08		1.08		1.08		1.08	
Deviance	1145.20		1049.41		1045.52		1055.57		1048.55	

Note: Model1 is an intercept only; Model2 includes time as a level 1 predictor; Model3 includes time at level 1 and gender as a level 2 predictor; Model4 includes time at level 1 and AIMS as a level 2 predictor; Model5 includes time at level 1, gender and AIMS as level 2 predictors. Models includes time at level 1, gender and AIMS as level 2 predictors. All models estimated with 341 level-1 units and 35 level-2 units, and each model had two estimated parameters.

* $p < .05$. ** $p < .01$. *** $p < .001$.

RQ4: Students' Written Argumentation

On average, students' written argumentation increased over the course of the QT intervention (Cohen's $d = .35$).

Table 2

Multilevel Models for Written Argumentation Outcome

Variable	Model1		Model2		Model3		Model4		Model5	
	Est.	SE	Est.	SE	Est.	SE	Est.	SE	Est.	SE
Fixed Effects										
Intercept	3.75***	.10	3.34***	.16	3.09***	.17	2.86***	.42	2.72***	.40
Growth Rate			.09***	.03	.09***	.03	.09***	.03	.09***	.03
Gender					.45*	.18			.43*	.18
AIMS							.00	.003	.00	.002
Random Effects										
Intercept	.15**	.02	.15**	.02	.11*	.01	.15**	.02	.12*	.01
Within Student	2.08		2.01		2.01		2.01		2.01	
Deviance	1232.15		1227.47		1221.90		1234.15		1232.63	

Note: Model1 is an intercept only; Model2 includes time as a level 1 predictor; Model3 includes time at level 1 and gender as a level 2 predictor; Model4 includes time at level 1 and AIMS as a level 2 predictor; Model5 includes time at level 1, gender and AIMS as level 2 predictors. Models includes time at level 1, gender and AIMS as level 2 predictors. All models estimated with 350 level-1 units and 35 level-2 units, and each model had two estimated parameters.

* $p < .05$. ** $p < .01$. *** $p < .001$.

CONCLUSIONS

- In this study, we examined a year-long implementation of Quality Talk, tracking changes in both teachers' and students' discourse as well as students' text comprehension and written argumentation. Over the course of the academic year, we trained, supported, and coached two fourth-grade teachers to implement Quality Talk with high fidelity.
- Quality Talk was associated with unusually high average growth in text comprehension performance. Likewise, students' performance on a transfer measure to written argumentation increased in statistically and practically significant ways. Given recent NAEP findings, the growth in argumentation performance was striking.