

The use of Quality Talk to foster critical thinking in a low socio-economic secondary Geography classroom

Maree J. Davies

Faculty of Education and Social Work, The University of Auckland, New Zealand

Simon Esling

Faculty of Education and Social Work, The University of Auckland, New Zealand

ABSTRACT

This small case study investigated the use of the Quality Talk framework to empower students to pool their knowledge in group discussions around a novel topic or event. The main goals of the Quality Talk approach were to provide teachers with a prescriptive framework for increasing their students' critical-analytical thinking by providing greater opportunity for student voice. The quasi-experimental methodology involved students and a teacher from a low socio-economic secondary school in a large city in New Zealand in the curriculum area of Geography. The students, on self-report, identified as coming from predominantly Pasifika backgrounds. Following the intervention and additional opportunities to conduct group discussions, many of the students identified how other opinions contributed to their understanding of the topic. An episode of talk is considered a 'dialogic spell', rather than a discussion, if the discussion begins with a student's question and is followed by at least two more questions from other students. When students used higher numbers of uptake questions and high-level questions, they increased their levels of 'dialogic spell'. The students' increase of critical-analytical thinking in their pre- and post-test was assessed and graded. The study was important because it also showed that when the teacher relinquished their role as facilitator of the discussions, the students self-facilitated the dialogue amongst themselves.

This case study aimed to contribute to our knowledge about the effectiveness of group discussions among a group of secondary school students, in a low socio-economic environment, using a Quality Talk framework that is designed to foster greater critical-analytical thinking and writing due to the students engaging in complex talk prior to writing. The students were studying senior Geography in a large metropolitan city in New Zealand. The study sought to examine what impact Quality Talk would have on the nature of the students' interaction in rich, student-led group discussions. In this case the topic was around coffee production and its global impact. Although New Zealand is remote in its geographic location, there has always been a consistent outward-looking engagement with the world. Between 2002 and 2004, New Zealand's

Ministry of Education introduced a standards-based qualification system for secondary students in the hope of providing greater equity for students in low socio-economic contexts. This type of standardised testing illustrates New Zealand's desire to incorporate international approaches into its national policies. Prior to the standards-based assessment, a norm-referenced assessment model was used, with predetermined proportions of students who would pass or fail. The newer, standards-based system is called the National Certificate of Educational Achievement (NCEA) and aimed to be inclusive of all students (Hipkins, Johnston & Sheehan, 2016).

Although these standards-based assessments were designed to encourage equity, such as the Geography standard in this study, they also required high-level

analysis. For example, the NCEA standard in this study requires students to explain aspects of a geographic topic on a global scale, encouraging them to think on a series of spatial levels to articulate details of which they may have little or no prior knowledge. This big-picture approach requires an exploration of what is occurring locally, nationally, and internationally, and, most importantly, how these layers (and the people and places within them) interact and influence each other. Students were not only learning about issues and places beyond their local experience, but also practising the skills necessary to bring together the many factors that affect different people in different places. The topic chosen for this Geography standard was international coffee production, which required students to identify and describe its global pattern before explaining and discussing how it affects people around the world.

The New Zealand Ministry of Education has published cultural competency frameworks for teachers of Pasifika (Ministry of Education, 2018) and Māori (indigenous) students (Ministry of Education, 2011), which are particularly relevant to this study, given most of the students are from Pasifika origins. The cultural recommendations for teachers of Pasifika students is called *Tapasā*, which is a Samoan term with a similar meaning to compass. That is, *Tapasā* serves as a guide for teachers as they navigate their own journey of becoming more culturally aware and competent and as a symbol of the learning pathway that Pacific learners' and their families take (Ministry of Education, 2018). One of the recommendations from *Tapasā* includes recognising the importance of cultural locatedness within educational settings and for learner well-being and achievement to be enabled. Within the *Ngā Turu* (the competencies), *Turu 3* gives a description of effective pedagogies for Pacific learners by suggesting a strengths-based practice that builds on the cultural and linguistic capital that Pacific learners bring. We suggest that a talking framework, such as Quality Talk, provides a pragmatic platform for students to bring their strengths to bear on conversations, rather than having their voice dominated by a teacher leading all the discussions. Students are more likely to draw upon their own worldview around a topic if given the autonomy to talk amongst themselves.

This study set out to investigate whether empowering the students to pool their knowledge and ideas in group discussions, using the Quality Talk framework, could, in part, mitigate their lack of experience with, or knowledge of, coffee production and consumption. It is hypothesised that, through substantive discussions using the pedagogy of Quality Talk, students' cumulative knowledge and critical thinking will come to the

fore. It is expected that there will be evidence of greater levels of critical-analytical thinking within the group discussions and subsequent written work following the intervention. The teacher checked for prior knowledge of the growing and consumption of coffee and the students indicated little or no prior knowledge, which is not out of the ordinary. Three students, who also studied history, were aware of some historical Latin American geo-politics and early trade routes.

Quality Talk

Quality Talk is a framework designed through a collaboration between the University of Pennsylvania and Ohio University, USA. The framework was developed from a meta-analysis of 42 quantitative studies on discussion-based teaching approaches in primary school settings (Murphy, Wilkinson, Soter, Hennessey & Alexander, 2009). From the meta-analysis, the researchers identified programs which fostered a critical-analytical stance in students. This study and others found that these tended to be programs in which the teacher organised the text and topic, but the students had control over interpretive authority and turn-taking, thus resulting in shared control between teacher and students (Chinn, Anderson & Waggoner, 2001; Ladson-Billings & Tate, 2006; Murphy et al., 2009; Murphy, Rowe, Ramani & Silverman, 2014). Wilkinson, Soter and Murphy (2010) developed the Quality Talk approach by combining the best features of extant approaches to conducting classroom discussions, giving prominence to those features that emphasise a critical-analytical orientation toward text (see Figure 1).

The main goals of the Quality Talk approach are to provide teachers with a prescriptive framework for increasing students' critical-analytical thinking and comprehension of text. It has often been employed by primary-school teachers and students, with students taking responsibility for co-constructing their own learning as the goal (Murphy et al., 2014). Recently, Quality Talk has been extended to Quality Talk Science as a Science-specific instantiation of Quality Talk. In 2017, a study of students using the Quality Talk Science model increased their use of relational reasoning (Murphy, Firetto & Greene, 2017). In another study, using the same Quality Talk Science model, high-school physics and chemistry students' small-group discourse was examined. Results revealed treatment teachers and students' discourse practices better reflected critical-analytic thinking, argumentation and stronger written scientific arguments than comparison students (Murphy et al., 2018). However, students' growth in conceptual understanding was not significant (Murphy et al., 2018).

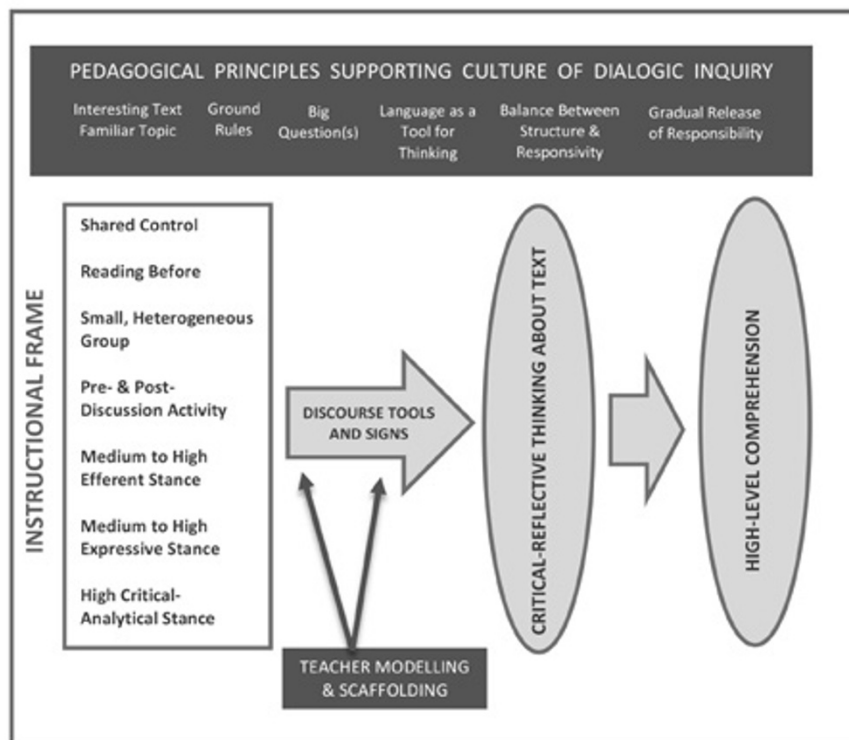


Figure 1. Components of the Quality Talk approach. Source: Quality Talk (2012). Quality Talk Summary. Retrieved from <http://www.quality-talk.org/summary.html> Reproduced with permission.

Quality Talk was designed for teachers to facilitate classroom discussions by asking authentic questions to the students (Wilkinson, Soter & Murphy, 2010). The pedagogical stance of the teacher is expected to be one of a facilitator rather than leader (Herbel-Eisenmann, Steele & Cirillo, 2013; Murphy, Firetto & Greene, 2017; Wei, Murphy & Firetto, 2018). For the purposes of this study the framework of Quality Talk was taught to the students by the teacher and then the teacher's role was not to facilitate the conversation further, but to provide support to the students in their own facilitation of the Quality Talk model. The researchers were interested in the extent to which students could be self-managing of such a model with very little direction from the teacher.

Dialogic spells and exploratory talk

A 'dialogic spell' (Nystrand, Wu, Gamoran, Zeiser & Long, 2003, p. 136) is more likely to occur if teachers and students increase their use of authentic, uptake and high-level questions. An episode of talk is considered a dialogic spell, rather than a discussion, if it begins with a student question (a dialogic bid) and is followed by at least two more questions from other students. The teacher may contribute by asking questions, as long as they do not significantly alter the course of the conversation (Nystrand et al., 2003). Critical-analytical thinking is more likely to occur during a

dialogic spell than in traditional dialogue (Nystrand et al., 2003). Furthermore, if students use more reasoning words and elaborated explanations, they are more likely to engage in more challenging dialogue. This is known as 'exploratory talk' (Mercer, Dawes, Wegerif & Sams, 2004, p. 360) and it improves the quality of the conversations further. For an episode to be considered exploratory talk there needs to be a challenge or disagreement within the episode. The teacher purposefully did not contribute throughout the discussions but encouraged the students to use the framework of Quality Talk themselves.

Quality Talk sits within the wider theoretical background of dialogic pedagogy which has been studied in detail since the start of the 21st Century. A key goal of dialogic pedagogy has been to observe optimal patterns of talk that open up classroom discussions to promote greater student participation, engagement and learning (Davies & Meissel, 2016; Howe, Hennessey, Mercer, Vrikki & Wheatley, 2019). Quality Talk is underpinned by a socio-cultural theory of learning that posits that knowledge and meaning are co-constructed and that language plays a central mediating role (Littleton & Mercer, 2013). Socio-cultural theory advances the importance of students being given the opportunity to assume greater control over their learning. Alexander (2006) placed emphasis on teachers developing their repertoire of 'talk moves'

as part of the conceptualisation of dialogic pedagogy. However, given the students are of senior secondary age, this study set out to trial the model Quality Talk so that the students control the ‘talk moves’ that have been found to increase the complexity of discussions.

Socio-economic context

The study set out to trial Quality Talk for secondary students who live and attend school in a low socio-economic context and in the subject area of Geography, which have not been trialled before. Factors that may impact achievement for low socio-economic students can be, in part, due to a number of complex environmental constraints or pressures, such as less input from parents or guardians due to multiple jobs, more part-time work or family commitments and less time to study or travel and therefore fewer experiences with which to make connections to abstract ideas (Lareau, 2012). Therefore, investigating pedagogy that is empowering and encourages student voice is important. ‘Powerful knowledge’, to use Michael Young’s (2013, p. 195) term, is knowledge with epistemic and specialised properties that has the purpose of assisting students to think about the world in abstract or conceptual ways. This type of knowledge provides students with the ability to develop a critical awareness of the disparate forces structuring their lives and to imagine alternatives beyond their lived experiences (Beck, 2013).

Discourse and empowerment

Research in low socio-economic schools is compelling because recent research in the sociology of education, which theorises curriculum knowledge using the ideas of Durkheim, Vygotsky and Bernstein, suggests that academic knowledge contains the means by which the working-class and marginalised groups might overcome class determinism (Rata, 2016). Therefore, this study set out to trial a pedagogical approach that acknowledges that not all students have access to powerful forms of knowledge (Janks, 2010). It considers the diversity within the class as offering the potential to overcome gaps in knowledge acquisition (Grant & Sleeter, 2011). This study set out to investigate if a framework like Quality Talk could assist the students to mitigate the difficulties of having little experience with the geo-politics and economics of coffee production by way of complex discussions, almost exclusively led by the students themselves. By asking each other an increasing number of questions, pooling knowledge and motivating each other to think more deeply, it is presupposed that students might be able to understand the global impact of coffee with greater critical-analytical thought.

Table 1. Summary of Quality Talk Codes (based on Soter, Wilkinson, Murphy, Rudge, & Reninger, 2016)

Authentic question	One for which the person does not know the answer or is genuinely interested in knowing how others will answer.
Test question	An inauthentic question which presupposes one correct answer.
Other question	Includes aborted, rhetorical, procedural, or discourse management.
Uptake statement	A statement that adds or confirms a single piece of information.
Uptake question	Where the person asking the question asks about something that someone else said previously.
High-level thinking questions	A question that leads to generalisation, analysis, or speculation. A question can be judged to be a high-level thinking question if it elicits new information, rather than old information, or if it cannot be answered through routine application of prior knowledge.
Inter-textual reference question	A question that elicits reference to other literary or non-literary works, other works of art, or media, television, newspapers or magazines.
Affective response question	A question that elicits information about students’ feelings or about their lives in relation to film/text.
Reasoning words	Because, if, so, I think, agree, disagree, would, wouldn’t, would’ve, could, couldn’t, could’ve, may be, might, as if, like, but, how, why.
Elaborated explanation	A statement of claim that is based on at least two reasons, either independent or conjunctive or causally connected, or at least a reason and evidence for the reason, where the student makes explicit the link between the claim and their reasons or evidence.
Dialogic spell	An episode of talk is considered a dialogic spell rather than a discussion if the discussion begins with a student question (dialogic bid) and is followed by at least two more questions so long as they do not significantly alter the course of the conversation (Nystrand, Wu, Gamoran, Zeiser, & Long, 2003).
Exploratory talk	For an episode to be considered exploratory talk, a challenge is needed which results, in turn, in a discussion about this challenge. The challenge is not merely for disputing purposes (Mercer & Littleton, 2007).

Research questions

- What impact does the intervention Quality Talk have on the nature of the interactions between students?
- What impact does the intervention Quality Talk have on the students' ability to write with a critical-analytical stance?
- What is the impact of the intervention Quality Talk on the students' beliefs about talk?
- What impact does the intervention Quality Talk have on the teacher's beliefs about student talk?

Method

Prior beliefs

To establish prior beliefs about the use of dialogue and its impact on students' abilities to learn, a questionnaire was given to the teacher, George (a pseudonym). The questions were: 'What are your beliefs about the use of group discussions and their impact on students ability to learn?'; 'How do you normally organise group discussions?'; 'What kinds of students are better/not so good at learning in a group discussion?'; 'Do you think that group discussions are motivating and engaging for students?'; and 'In what ways do you think group discussions can assist students to be self-regulating as learners?'

Time one (baseline)

The students were given a 200-word essay to establish their baseline levels of critical-analytical thinking on the previous topic they had finished studying. George concurred that the students would have enough domain knowledge at the end of the topic to be able to write an argumentative essay of 200 words. *Time one* also consisted of George being filmed and audio-recorded while taking a lesson in which he incorporated group discussions in the normal way. George was asked to put the students into groups that would remain as close to the same for the duration of the study. The group discussions were 15 minutes long, audio-recorded and transcribed by a professional transcriber. The students were given a questionnaire that also consisted of questions around their beliefs about the impact of dialogue on their learning.

Professional development

Following *Time one* George participated in a one-day workshop in which the researchers went over key principles of learning, research on dialogic talk, the construct of Quality Talk, research to date on Quality Talk and the rationale behind using the Quality Talk framework.

Intervention – teacher's lessons to students

Following the professional development day, the principal researcher met with George to answer any questions and to check that he felt informed and comfortable teaching within the Quality Talk framework. The intervention lesson was planned in detail by both the principal researcher and George. On the day of the intervention lesson George taught the students the different components of Quality Talk. Examples were provided of each component, using geography contexts, and a video clip of students of a similar age, engaged in a group discussion, was discussed in terms of the Quality Talk framework. George also showed his students a news clip that he believed would be of high interest to the students, and relevant to geography, and critiqued the interviewer's use of questioning. He pointed out when the interviewer could have used the different types of questions from Quality Talk, such as authentic, uptake and high-level questions, to elicit more depth to the answers. George also discussed classroom environmental aspects, such as respecting one another. Next, a group of students was invited to sit in the middle of the classroom, in a fishbowl activity, where they practiced a discussion based on geography and the students sitting outside the fishbowl gave constructive feedback to the degree of implementation of Quality Talk. Once the lesson was completed the researcher and George engaged in feedback and discussion, the researcher was able to answer any questions that George felt unsure about.

Time two

Several days following the practice lesson, the students in the Geography class was given the opportunity to engage in a dialogical discussion using the construct of Quality Talk. George asked an authentic question which was purposefully provocative, but closely aligned to the type of question that the students would be asked in the external exam. The prompt was considered an authentic question because it enabled open debate and discussion, with no single answer. The tautology was that 'coffee production will always produce poverty somewhere in the world – someone has to pay the price.' After the discussion the students were asked to complete several questions in a written questionnaire to establish attitudes to the group discussions and the levels of their metacognitive awareness of what was expected of them for the future high-stakes assessment tasks that this study was preparing them for. The questions were: 'What makes a good discussion?'; 'Describe in your own words what the marker of your essay will be looking for if they were to grade you an excellence for your essay in the external geography study exam';

and ‘Do you think that talking in your group today helped you to think more deeply – if YES then say how it helped you to think more deeply and if NO then say why it did not help you to think more deeply.’

Time three

Four weeks after *Time two* the students were given another authentic question on the topic of coffee production and asked to engage in a 15-minute group discussion, again using Quality Talk to help frame the discussion. Questionnaires were given to the students and to George to determine if they felt these group discussions had an impact on the students’ abilities to think, talk and write more deeply. The questions to the students were ‘What is similar about a dialogical discussion to your normal group discussions?’; ‘What is different about a dialogical discussion to your normal group discussion?’; ‘What motivated you to participate in your group’s dialogical discussion?’; ‘Is there anything that stopped you from participating?’ and ‘If you did not participate but enjoyed listening please make a comment.’

Post-intervention essay

Following *Time three*, the students were asked to write another 200-word essay. This time the topic was an external examination topic from the previous year’s geography national exam and the students based their answers on the topic of coffee production. These essays were graded according to the criteria explained in the measures and coding section (below).

Participants

The students and teacher, George, were selected from a low socio-economic secondary school in a large city in New Zealand. The school is classified with a Decile 2 rating which means the New Zealand Government funds the school with more money than a school with a higher decile rating (schools are rated up to Decile 10). Further evidence that the students were from low-income families was that several students did not have internet access at home. There were 25 students who, on self-report, identified they came from predominantly Pasifika backgrounds: 25% were Fiji Indian, 16% Niuean, 25% Cook Island Māori, 16% Samoan, 8% Māori, 8% Indian, and 2% other (Samoan/Chinese). There were 12 females and 13 males. A geography lecturer, Polo (a pseudonym), who was also an ex-secondary school geography teacher, and had worked 15 years as a geography lecturer at a large university, graded the pre- and post-essays of the students in the study.

Phases of the study

Measures and coding

The students’ essays for their previous topic was coded by Polo to check for the number of critical-analytical (CA) statements (Wade, Thompson & Watkins, 1994) and later for the post-intervention essays around the topic of coffee production. To ensure unbiased coding, another geography lecturer at the university graded the essays. Polo checked with his fellow geography lecturer and the agreement rate for the grading of these essays was 95%. For the other 5%, the essay results were discussed with the researchers and both the lecturers and researchers agreed on a final grade for these 5% and then all results were recorded. The students’ questionnaires were initially coded using highlighting to signify participant passages worthy of attention (Boyatzis, 1998); they were then reviewed for pre- and post-intervention similarities and differences (Hatch, 2002). Finally, themes and concepts were systematically interrelated to help guide the researchers towards the students’ development of critical-analytical thinking that may have contributed to changes in behaviour and beliefs around the group discussions (Corbin & Strauss, 2008).

Results

Time one (baseline)

The video recording shows the conversation between the students was amicable and the students freely conversed with each other. However, close analysis of the transcript reveals there is a lack of evidence of the students questioning the validity of what each is saying, which almost dissolves any need for evidence. The nature of the questioning ensures that, if any evidence is provided, it is left unchallenged without any concern for whether it supports any conclusion. A comment in another part of the following transcript – ‘I hear that Brazil produces the most coffee’ – went unchallenged, as were many other comments of this nature. This indicated that the students were not used to asking about the source of information, such as where had the student ‘heard’ that Brazil produces the most coffee beans.

Table 2 Number of critical-analytical statements in students’ essays graded by geography lecturer Polo

Number of critical analytical statements in final essays for previous geography topic.	18
Post-intervention critical analytical statements around coffee topic.	79

Table 3. Shifts in the total use of questions and dialogic spells across the three times of data collection

Selected Quality Talk indicators	% of Authentic Questions as % of total questions asked	% of Uptake Questions as % of total questions asked	% of High-level questions % of total of questions asked	% of other questions such as discourse management	Total %	% of overall episodes (15-minute group discussions) in Dialogic spells
Baseline	42%	24%	16%	18%	100%	0%
Time two	26%	44%	26%	4%	100%	83%
Time three	21%	51%	22%	6%	100%	85%

Table 4. Time one (baseline) transcript sample with coding and comments

Teacher	Because if you want to write a thank you card, who do you think you would address it to?	Teacher authentic question	
Oriana	To the farmer.	Uptake statement	
Teacher	The farmers, okay.		Teacher evaluating response of student.
Oriana	To the delivery man.	Uptake statement	
Teacher	Delivery man, yeah.		Teacher evaluating response of student.
Oriana	To um ... what do you call the people that...	Other question	
Robert	Grinders.	Uptake statement	
Oriana	The people that grind the coffee.	Uptake statement	
Robert	Grinders.	Uptake statement	
Teacher	The grinders yeah. I'm not worried if you don't have the technical jargon. Use this info graphic to help you eh, because it's showing what happens once a coffee bean is picked.		The teacher is giving instruction to the students on how to gather more information.
Hele	Harvesters.	Uptake statement	
Teacher	Harvested okay, it's roasted, and it's packaged, and it's shipped.		Teacher provides low level evaluation of Hele's uptake statement and then goes on to provide further information.
Oriana	Packers.	Uptake statement	
Robert	Exporters.	Uptake statement	
Teacher	Good.		Teacher provides low level evaluation as feedback.
Hele	So, we've got indirect...?	Other question	
Teacher	Guys just for inspiration just look at this table, now what have we got here? We've got milk. Where did the milk come from?	Closed question	Authentic question to the students but answered by teacher.

Time one (baseline) provocation

To provide some experiential interest in the topic of coffee, George brought to school a coffee pot and coffee and the students had a cup of hot coffee. Following the drinking of the coffee, George said to the students, if you had to write a thank you card for the coffee, who do you think you would address it to and why? The teacher sat with one group throughout the 15-minute group discussion and facilitated the discussion.

George provides positive low-level evaluative feedback to the students throughout the discussion (Nystrand et al., 2003). He asks authentic questions to the students and the students' responses are predominantly statements that uptake on George's facilitation questions or statements (Nystrand et al., 2003). The students are happily engaged and clearly have a positive rapport with each other and George.

Time two

The students have now been trained by George in using Quality Talk to embark on their first group dialogical discussion. The students are reminded by George of the Quality Talk framework. George gave instructions on using Quality Talk and left them to their discussion. His role changed from that of facilitator, managing the conversation, to that of empowering the students to take the lead.

Time two provocation

The provocation provided by George is that 'growing coffee will always produce poverty somewhere'. Just prior to this sample of the transcript in Table 5 the students are discussing different coffee growing countries and the amounts of money these countries get or don't get from the production of coffee. During this discussion Hele raises the point that farmers, no matter what the country, must pay the price.

The use of uptake and authentic questioning from Hele forces Robert to take a stand, but he soon appears self-conscious and so Oriana steps in to suggest a more respectful tone to the questioning. Oriana facilitates the conversation further and enables Hele to propose an uptake statement followed later by an elaborated explanation. Although Hele reasserts Robert's claim that 'farmers have to pay the price' the conversation is carried on by Amil, who makes a claim around politics via another elaborated explanation. As this dialogic spell comes to a close, Hele switches her thinking from 'farmers have to pay the price' to 'how can we get the political side to come in?'

Time three

In the third group discussion the students begin to

evaluate their own claims for bias and assumptions around politics by way of uptake questions, such as: 'Why do you agree with communism?' and 'Is it your personal opinion?' This illustrates how the use of uptake questions can prompt students to interrogate their own personal knowledge and beliefs from outside the prescribed geography course, which they have been using to supplement what has been learned inside the course. Furthermore, the scenario demonstrates that a talking framework, such as Quality Talk, can successfully empower students to be self-regulating.

Time three provocation

The students used new information, in the form of data from a short video on coffee production, to elaborate on the themes they have touched on through self-facilitation. The provocation from George remained, that 'growing coffee will always produce poverty somewhere.'

In *Time three* the students showed further critical-analytical engagement by developing a line of questioning around new data. The information from a short video was used to discuss how the Fair Trade model was not enough to combat the sheer numbers affected by low trading prices, despite becoming more mainstream. It was concluded by the students that the infiltration of the concept of Fair Trade into the market will bring better opportunities for education and so 'not necessarily their generation can break the poverty cycle, but future generations can.' The premise of this was challenged by a peer, leading to an evidence-driven explanation of how it might be possible. The students' confidence around respectfully debating the topic, to include more politics and data, resulted in a more sophisticated dialogical spell than *Time two*.

George's summation of the research study

To provide rich analysis of the case study, George was shown a sample of the group's videos and asked to comment. He preferred to write down his thoughts and analysis, as he felt he could offer richer analysis:

Despite being in agreement, the students in this discussion group (Kangaroos) are able to continue their dialogue by breaking their mutual argument down into its constituent parts – each part tackled by a different student – as a means of co-constructing an analysis of the situation that coffee growing produces poverty. Before the teaching of dialogical discussion, however, agreements tended to result in a muting of conversation and in the process stunting any progression toward critical analysis. [...] Although the aforementioned discussions do not meet all the criteria outlined in the NZQA definition of critical-analysis (This extends an analysis to involve examination of the factors or circumstances

Table 5. Time two transcript sample with coding and comments

Hele	Why do you agree?	Uptake question	
Robert	Because farmers have to pay the price.	Uptake statement	
Hele	Why, why do the farmers have to pay the price? Why not us?	Uptake question	
Robert	Well we, okay, you guys are putting me on the spot.		Robert seems uncomfortable with a direct question from a fellow student.
Oriana	Hele, you have to show respect, he showed respect to you.		Oriana reminds Hele to 'tone' down the direct questioning in her statement here. She is managing the group dynamic.
Hele	Why do you agree with that?		Hele rephrases with a gentler tone, but still insists on using an uptake question to Robert.
Robert	I don't have anything in my head.		Robert backs out of the conversation.
Hele	Oriana, what do you have to say about that?		Hele then moves on to Oriana for a response, accepting Robert's uncomfortableness.
Oriana	Oh, I agree.		
Hele	Why?	Uptake question	
Oriana	Because, like, farmers will always have to pay the price because, um, like, um, farmers don't have a choice, like whatever the price the buyer gives them they have to, um, go with it. Otherwise if they don't then they have no income coming in at all and, um...	Elaborated explanation	
Hele	I would like to build on Oriana's statement, how she said the farmers if they don't sell their coffee, they won't get an income. Like other people in the community will be affected as well, like teachers and stuff and school kids because there will be no, the farmers won't have money, they won't have income right so they won't have money to send their children to school and pay for their um kids' education therefore no fees will be in the school and the teachers won't be able to get paid because there's no money in the school.		Hele is now building on Oriana's statement with a further elaborated explanation.
Amil	Which decreases the development of the country.	Uptake statement	
Hele	Exactly.		
Robert	True.		Robert has returned to the conversation, with agreement, therefore revealing he was listening.
Robert	So, this is...		
Oriana	So, it's settled farmers will pay the price.	Uptake statement	
Robert	Anyone else disagree? I mean would you like to build on what you've said?	Other question	Robert has now fully returned to the conversation, inviting contributions through questioning.
Amil	I still disagree though.		

Robert	That was me yesterday.		
Amil	If the political side like I'm not saying that they have, or they haven't I'm saying why didn't they come and make a law about it. If they did the country wouldn't be in poverty. People wouldn't be in poverty. So, farmers wouldn't get unfair prices for coffee.	Elaborated explanation	Amil is now presenting a further case for his disagreement that farmers have to pay the price.
Oriana	So, wait how can we get the political side to come in?	Authentic question	Oriana challenges the group to consider the political aspect rather than just economic.
Amil	So, I think this, they just need to like look at the facts that if the country is dependent on coffee production, they have to build that even more and like they can just make up a company who sell their own coffee so that other, like Nestle or Starbucks doesn't have to come to ...	Elaborated explanation	Amil now responds with a statement that is critical analytical.

that may have influenced them, identifying and examining any irregularities, examining any relationships that appear, and will question and/or judge evidence), it must be considered that the students at this point have not been required to implement, and therefore have not been explicitly taught, these skills. It therefore stands to reason that the natural tendency for these discussions to steer into critical-analysis is a result of the dialogic discussion approach, and brings credit to the notion of challenging various beliefs against one another.

George was interviewed at the beginning of the study and post-study to ascertain his views on group discussions. At *Time one (baseline)* George explained that normally, for group discussions, he would set up groups in tables with a question that they would respond to, usually visually with a mind-map. As an aside, George lamented that he would like to do group work more often than he did.

When asked what he thought his biggest 'take home message' was post-study George commented that, prior to the study, he considered group discussions to be based around the idea of talking, but now 'I believe that group discussions are actually based around listening. [That] was [a] significant shift in my thinking, is that we learn by listening first, then thinking, and then talking and not the other way around.' George was also asked what surprised him about the participation of his students and he responded that the student who was the most advanced in the class, in terms of academic achievement to date, did not engage as much as her peers in the discussions. When she did, he noted (from viewing the video clips) she seemed to be more concerned with delivering a 'correct' and well-researched answer than asking questions or delving into unknown territory. Another surprise to George was that students who did not have an obvious relationship to each other appeared to very open and argumentative with one another once placed in the same group for the discussions. This was after the framework had been taught.

When asked what impact Quality Talk had on learning for the students, George noted it was mostly a 'widening of the lens' through which his students viewed their own learning. George saw promise in the students challenging each other, requiring them to go deeper with their thinking. George also believed that encouraging and facilitating deeper conversations, through Quality Talk, could also translate into deeper written answers. It also taught the students valuable interpersonal communication skills. He felt that not participating as much in the group discussions post-baseline, but teaching the skills of Quality Talk, was showing respect to the students by genuinely valuing what they had to say. George felt the professional training he received was positive, with constant support from the researchers, the professional readings, and the discussions with the other teachers in the study. He noted that watching other teachers teach the Quality Talk skills was the most helpful. He believed the students could have benefited from more video footage of other students using the framework of Quality Talk because some students may have found the ideas too abstract to begin with.

Results from the students' questionnaire responses

Being challenged was useful

The students had positive beliefs about what makes a good group discussion during *Time one (baseline)* and were firm that both the notion of mutual respect and having something to say was important. For example: 'Having knowledge of the topic'; 'Talking one at a time'; 'Backing up your statements with detailed examples'; 'Not personally attacking'; 'Open conversations'; and 'When people listen carefully to others, and their answers.' Interestingly, post-intervention, many of the students expressed the opportunity of arguing

Table 6. Time three transcript sample with coding and comments

Oriana	When you say that people purchase, um, Free Trade coffee that they want to make profit?	Authentic question	
Robert	Not on its own. The poverty cycle will not be broken just like that.	Uptake statement	
Oriana	Because like Starbucks, in 2009 they did Fair Trade coffee, they bought 40 million pounds of coffee and they made, in the first quarter of 2009, they made 2.7 billion dollars in the last quarter of 2009 alone through Fair Trade coffee.	Elaborated explanation	
Hele	And in 2008 the sales of Fair Trade coffee was only 1.75 million dollars, and if Starbucks can do that alone then I think Fair Trade can break the cycle of poverty. And that's just one company. That's just Starbucks. Not necessary break the whole poverty but all of these, make people aware.	Elaborated explanation	
Robert	What other factors could break the coffee poverty cycle?	High level question, speculative	
Hele	That is very good.		Hele is positively affirming Robert's use of a high-level question.
Robert	I know.		
Hele	This is where there needs to be education because we don't know.	Uptake statement	
Robert	Cause there's Fair Trade and that's quite a lot with Starbucks.	Uptake statement	
Oriana	You can have Fair Trade coffee right. Farmers make profit. Profit goes in to education. That profit also goes into um the community services, facilities and stuff. If that can, if you invest that into your children, if you invest that into your children then your children have a brighter future.	Elaborated explanation	
Teacher	Keep going.		George simply encourages the conversation to continue.
Oriana	Go Robert.		Positive peer support from Oriana.
Robert	So not necessarily their generation can break the poverty cycle, but future generations can.	Uptake statement	
Oriana	I agree with your point.		Positive affirmation.
Hele	How?	Uptake question	
Robert	What do you mean how?		Clarifying Hele's question.
Hele	I'm just saying I want you to explain how.		
Robert	If the whole coffee production thing went to Fair Trade, then farmers make profit and big companies make profit as well. But when farmers make profit, they can invest that profit into um facilities such as school, hospitals and they could buy food aid and stuff like that. If they push that towards their children though, if they get that for their children then they have a better chance of having a successful future and if they have a successful future they can come back to their communities and break that cycle. It will be like a cycle.	Elaborated explanation	

Oriana	Ok, I would like to build on what you're saying by how much of the Fair Trade coffee prices go back to the actual farmer? Cause is there actual statistic that says how much of the Fair Trade coffee prices go back to the farmer or if any actually goes back. Cause they could be lying.	Elaborated explanation	
Hele	No, it actually does go back because with Fair Trade like sometimes they're given what's called a Fair Trade premium which is basically, basically extra money that is used only for building up the community.	Elaborated explanation	
Robert	In the video we saw 12 cents per pound right. In Fair Trade coffee they get paid a dollar 35 cents. Just it's a lot. It's [13%] more than prices.	Elaborated explanation	
Hele	Did you hear that Oriana? It's a video we saw. Farmers getting paid 12 cents per pound.		

and disagreeing as being highly motivating in the group discussions, such as: 'Being counter-challenged and analysing other people's opinion'; 'Challenging, someone [who] disagrees with you'; 'Someone disagreeing with your comment'; and 'Which makes you want to challenge the ideas of that person.' It appears the use of uptake questions within the conversations provided a pragmatic framework for the students to challenge the evidence provided by each other without derailing the existing relationships. At baseline the students had positive dispositional attitudes to each other, such as 'talking one at a time', but to reach the more complex critical thinking in later conversations the students needed to work out how to push each other without the cost of friendships and collegiality within the classroom dynamic.

Discussion

This small case study set out to trial a dialogue framework, Quality Talk, within a low socio-economic classroom to observe if shared collaboration of knowledge would collectively unravel richer dialogue and enable greater levels of critical-analytical thinking and talking between students. The results of the study revealed that once the students had been taught Quality Talk, they changed the nature of their interactions through an increased use of uptake questioning, high-level questioning, and enhanced levels of reasoning. The study showed that the students increased their use of dialogic spells through their increased use of student to student questioning. Furthermore, the increase in the number of critical-analytical statements within their written essays post-study was pronounced (see Table 2).

Dewey (1938) in his ground-breaking work, *Experience and Education*, offered an alternative to what he termed 'traditional' education. Rather than traditional models, Dewey (1938) proposed a 'progressive' education which considers students' experience when

considering what to teach them, in the hopes of further engaging them in their own self-education. Closer to home a much larger research project, Te Kohitangata, examined teaching and learning to assist the inequities within the New Zealand education system (Organisation for Economic Co-operation and Development, 2013). One of the major findings was that students from low socio-economic or marginalised contexts benefitted from a culturally responsive context for learning in which teachers care for, and acknowledge, the mana (authority/status) of the students as culturally located individuals (Bishop & Berryman, 2010). While the students may engage their local knowledge to help develop their global knowledge, it is their collective discussions and overlaying of group knowledge, often assessing new information in the process that can promote their critical-analyses of a novel topic, such as coffee production in relation to poverty. This is evidenced by the advancements of discussions across *Times one, two* and *three* and the sophisticated debates that developed.

The increase in student to student questioning was an important finding because talk between students, that includes challenging questions, may contribute toward deeper, more reasoned thinking (Nystrand et al., 2003). Reasoning underpins critical thinking because reasoning involves participants thinking beyond themselves and considering others when in conversation. The implication of this finding for teachers is that students will not naturally question each other, so interventions should be sought. Through interventions such as Quality Talk, the students are more likely to engage in discussions, facilitated by themselves, with a higher likelihood of culturally located knowledge shared and a growth in confidence and aptitude by the students in the use of critical analytical thinking. Therefore, if the talk is to contribute to deeper learning, teachers need to teach students how to talk with reasoning skills. Two

themes emerged around the students' knowledge and attitude among those who scored high critical-analytical results in their post-intervention writing: These students demonstrated conditional knowledge about the difference between a normal group discussion and a discussion using the Quality Talk features and, in terms of attitude, these students saw the 'challenge' from others as an important component to their learning.

Research in dialogical discussions in primary schools has recommended the use of questions from the teacher to help foster a rich discussion (Nystrand et al., 2003). This study showed that it was not the teacher's use of questions, but the questioning between the students that came to the fore. This study concurred with Smith and Higgins' (2006) research which argued that the intent and nature of the feedback from the teacher is more effective than their questions during dialogical discussions. Their reasoning is that, as Mehan (1979) argued that, in forming a question, teachers have already 'established the parameters in which a reply can properly fall' (p. 286). Thus, even if the teacher asks an open question, the teacher may already have an implicit pool of possibilities from which they will predict and expect students to answer, as evidenced in *Time one* of this study. Students are therefore likely to see any type of question as a directive. The researchers believe that learning to debate a topic using critical-analytical thinking goes beyond the learning in the classroom and preparing for a standardised national assessment. It is only through having the opportunities of questioning each other, sharing culturally-located knowledge as a lens on global knowledge, and facilitation through self-leadership, will young people gain the competence and confidence to use critical-analytical thinking beyond the classroom.

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>

References

- Alexander, R. (2006). *Towards dialogic thinking: Rethinking classroom talk*. York, United Kingdom: Dialogos.
- Beck, J. (2013). Powerful knowledge, esoteric knowledge, curriculum knowledge. *Cambridge Journal of Education*, 43(2), 177–193. doi:10.1080/0305764X.2013.767880
- Bishop, R. & Berryman, M. (2010). Te kotahitanga: Culturally responsive professional development for teachers. *Teacher Development*, 14(2), 173–187. doi:10.1080/13664530.2010.494497
- Boyatzis, R. (1998). *Transforming qualitative information: Thematic analysis and code development*. Thousand Oaks, CA: Sage.
- Chinn, C.A., Anderson, R.C. & Waggoner, M. (2001). Patterns of discourse in two kinds of literature discussions. *Reading Research Quarterly*, 36(4), 378–411. doi:10.1598/RRQ.36.4.3
- Corbin, J. & Strauss, A. (2008). *Basics of qualitative research*. London, United Kingdom: Sage.
- Davies, M. & Meissel, K. (2016). The use of Quality Talk to increase critical analytical speaking and writing of students in three secondary schools. *British Educational Research Journal*, 42(2), 342–365. doi:10.1002/berj.3210
- Dewey, J. (1938). *Experience and education*. New York, NY: Collier Books.
- Grant, C. & Sleeter, C. (2011). *Doing multicultural education for achievement and equity*. New York, NY: Routledge.
- Hatch, J. (2002). *Doing qualitative research in education settings*. Albany, NY: State University of New York Press.
- Herbel-Eisenmann, B.A., Steele, M.D. & Cirillo, M. (2013). (Developing) teacher discourse moves: A framework for professional development. *Mathematics Teacher Educator*, 1(2), 181–196. doi:10.5951/mathteacheduc.1.2.0181
- Hipkins, R., Johnston, M. & Sheehan, M. (2016). *NCEA in context*. Wellington, New Zealand: NZCER Press.
- Howe, C., Hennessy, S., Mercer, N., Vrieki, M. & Wheatley, L. (2019). Teacher-student dialogue during classroom teaching: Does it really impact on student outcomes? *The Journal of the Learning Sciences*, 1–51. doi:10.1080/10508406.2019.1573730
- Janks, H. (2010). *Literacy and power*. London, United Kingdom: Routledge.
- Ladson-Billings, G.J. & Tate, W. (2006). *Education research in the public interest: Social justice, action, and policy*. New York: NY: Teachers College Press.
- Lareau, A. (2012). Using the terms hypothesis and variable for qualitative work: A critical reflection. *Journal of Marriage and Family*, 74(4), 671–677. doi:10.1111/j.1741-3737.2012.00980.x
- Littleton, K. & Mercer, N. (2013). *Interthinking: Putting talk to work*, Abingdon, United Kingdom: Routledge.
- Mehan, H. (1979). The study of social interactions in educational settings: Accomplishments and unresolved issues. *Human Development*, 41, 245–269.
- Mercer, N., Dawes, L., Wegerif, R. & Sams, C. (2004). Reasoning as a scientist: Ways of helping children to use language to learn science. *British Educational Research Journal*, 30(3), 359–377. doi:10.1080/01411920410001689689

- Ministry of Education. (2011). *Tātaiako: Cultural competencies for teachers of Māori learners*. Wellington, New Zealand: Author.
- Ministry of Education. (2018). *Tapasā: Cultural competencies framework for teachers of Pacific learners*. Wellington, New Zealand: Author.
- Murphy, P.K., Firetto, C.M. & Greene, J.A. (2017). Enriching students' scientific thinking through relational reasoning: Seeking evidence in texts, tasks, and talk. *Educational Psychology Review*, 29 (1), 105–117. doi:10.1007/s10648-016-9387-x
- Murphy, P.K., Greene, J.A., Allen, E., Baszczewski, S., Swearingen, A., Wei, L. & Butler, A.M. (2018). Fostering high school students' conceptual understanding and argumentation performance in science through *Quality Talk* discussions. *Science Education*, 102 (6), 1239–1264. doi:10.1002/sce.21471
- Murphy, P.K., Rowe, M.L., Ramani, G. & Silverman, R. (2014). Promoting critical-analytic thinking in children and adolescents at home and in school. *Educational Psychology Review*, 26 (4), 561–578. doi:10.1007/s10648-014-9281-3
- Murphy, P.K., Wilkinson, I.A.G., Soter, A.O., Hennessey, M.N. & Alexander, J.F. (2009). Examining the effects of classroom discussion on students' high-level comprehension of text: A meta-analysis. *Journal of Educational Psychology*, 101 (3), 740–764. doi:10.1037/a0015576
- Nystrand, M., Wu, L.L., Gamoran, A., Zeiser, S. & Long, D. (2003). Questions in time: Investigating the structure and dynamics of unfolding classroom discourse. *Discourse Processes*, 35 (2), 135–198. doi:10.1207/S15326950DP3502_3
- Organisation for Economic Co-operation and Development. (2013). PISA 2012 results: Ready to learn: students' engagement, drive and self-beliefs (Volume III): Preliminary version. *Programme for International Student Assessment, OECD*. Paris, France. Retrieved from <http://www.oecd.org/pisa/keyfindings/pisa-2012-results-volume-iii.htm>.
- Quality Talk (2012). *Quality Talk Summary*. Retrieved from <http://www.quality-talk.org/summary.html>
- Rata, E. (2016). A pedagogy of conceptual progression and the case for academic knowledge. *British Educational Research Journal*, 42 (1), 168–184. doi:10.1002/berj.3195
- Smith, H. & Higgins, S. (2006). Opening classroom interaction: The importance of feedback. *Cambridge Journal of Education*, 36 (4), 485–502. doi:10.1080/03057640601048357
- Soter, A.O., Wilkinson, I.A.G., Murphy, P.K., Rudge, L. & Reninger, K.B. (2016). *Analyzing the discourse of discussion: Coding manual* (Version 20). Ohio State University. doi:10.13140/RG.2.1.4171.4163
- Wade, S., Thompson, A. & Watkins, W. (1994). The role of belief systems in authors' and readers' constructions of texts. In R. Garner & P.A. Alexander (Eds.), *Beliefs about text and instruction with text* (pp. 265–293). Hillsdale, NJ: Lawrence Erlbaum.
- Wei, L., Murphy, K. & Firetto, C. (2018). How can teachers facilitate productive small-group talk? An integrated taxonomy of teacher discourse moves. *Elementary School Journal*, 118 (4), 578–609. doi:10.1086/697531
- Wilkinson, I.A.G., Soter, A.O. & Murphy, P.K. (2010). Developing a model of quality talk about literary text. In M.G. McKeown & L. Kucan (Eds.), *Bringing reading researchers to life: Essays in honor of Isabel L. Beck* (pp. 142–169). New York, NY: Guilford Press.
- Young, M. (2013). Powerful knowledge: An analytically useful concept or just a 'sexy sounding term'? A response to John Beck's 'Powerful knowledge, esoteric knowledge, curriculum knowledge.' *Cambridge Journal of Education*, 43 (2), 195–198. doi:10.1080/0305764X.2013.776356

Maree J. Davies is a Senior Lecturer at The University of Auckland, Faculty of Education and Social Work. Maree has conducted multiple research projects in the areas of critical thinking and dialogical discussions in middle and senior secondary schools, in both online and face to face environments. She has recently developed, with Patrick Girard, The University of Auckland, a new critical thinking model especially designed for the increased cognitive demands of secondary-aged students called 'Street Smarts'.

Simon Esling is a Research Adviser within Libraries and Learning Services at The University of Auckland, Faculty of Education and Social Work. Simon's focus is on supporting and enhancing the research capabilities of postgraduates and academic staff within the Faculty of Education and Social Work. His expertise lies in critical thinking in relation to information literacies; developing researchers' digital capabilities; and guidance with research data management.