Multi-modelling dialogic skills: The use of multiple resources to support classroom dialogue

Anja Amundrud, University of Oslo, Department of Education, Gaustadalleén 21, 0349 Oslo, Norway, anja.amundrud@iped.uio.no

Abstract: Students' dialogic skills can be an important predictor of academic achievement. Thus, it is crucial for teachers to support the development of this specific use of language as a tool to enable understanding of each other's knowledge and perspectives. The integration of other people's ideas into your own thinking enables the possibility of thinking together and constructing new knowledge together. The use of digital technology in classroom activities can support this form of dialogue, but to be beneficial, it requires integration into teachers' practices and task designs. This paper explores how students in a Norwegian 7th grade classroom are taught dialogic skills through their teacher's modelling and explicit focus on the use of language along with multiple resources. The data material is from the DiDiAC-project, which has a design-based approach and is grounded in sociocultural theory. The findings suggest that integrating *Talkwall* in classroom activities increases the possibilities of enhancing participation and making students' contributions visible, thus opening up for the opportunity to build a collective knowledge base to support knowledge building. Through these findings, we hope to contribute a perspective on how the integration of digital technology can support the development of dialogic skills.

Introduction

This paper explores how students in a Norwegian 7th grade classroom are taught dialogic skills through their teacher's modelling and explicit focus on "how to talk," along with the use of multiple resources, including the microblogging tool, *Talkwall*. The analysis is in a preliminary stage, and what is presented here is only a tiny fraction of the research on this teacher's practice. Further work will require a more nuanced and broader perspective.

With the use of an interaction analytical approach, I analyse two excerpts from whole-class discussions. The research question explored in this paper is: 'How can the teacher support students' development of dialogic skills with the use of multiple resources?'

The research reported is part of a larger project called *Digitalised Dialogues Across the Curriculum* (DiDiAC), which focuses on teachers' professional development and the development of new digital classroom practices.

Microblogging in classrooms

The use of digital technology in classroom activities may enhance new forms of dialogue (Rasmussen & Ludvigsen, 2010). However, it is not the technology itself that increases quality in classroom discussions (Rasmussen, Lund, & Smørdal, 2012). To be beneficial, technologies need to be integrated into the teacher's practices and task design (Dillenbourg, Järvelä, & Fisher, 2009). To productively handle the presence of technologies in classroom dialogue, there is a demand for norms and ground rules that are defined and regulated in the context of the classroom (Lund & Rasmussen, 2008; Rasmussen & Lund, 2015; Rasmussen et al., 2012). For dialogues to be sustained, participants must have a mutual perception of what is accepted and what is not (Sacks, 1992). Such ground rules are implicit characteristics for conversations, created to manage situations and interactions in local cultures such as classrooms (Edwards & Mercer 1987; Mercer & Littleton 2007). Studies have shown that ground rules jointly established by students improve participation and the quality of discussions. Thus, it is crucial that the students themselves help develop ground rules through joint reflection, which can lead to a sense of ownership and an obligation to use them (Rojas-Drummond, Pérez, Vélez, Gómez, & Mendoza, 2003).

While there is a body of well-established research on classroom dialogue and talk (e.g., Howe & Abedin, 2013; Mercer, 2008, 2013), there is less in-depth research on the use of microblogs as a *tool for talk*. *Talkwall* (Figure 1) is a microblogging tool developed by researchers at the University of Oslo. It is web-based and was created to promote and support classroom interaction. *Talkwall* draws on the microblogging approach of using only short messages to communicate, using this to encourage students to engage and share their developing ideas, in turn, promoting positive dialogic interactions. Short written texts can be produced either collectively or individually and can later be shared on a digital device. With hashtags (#), text can be sorted in order to make it easier for students to follow specific topics or selected concepts.
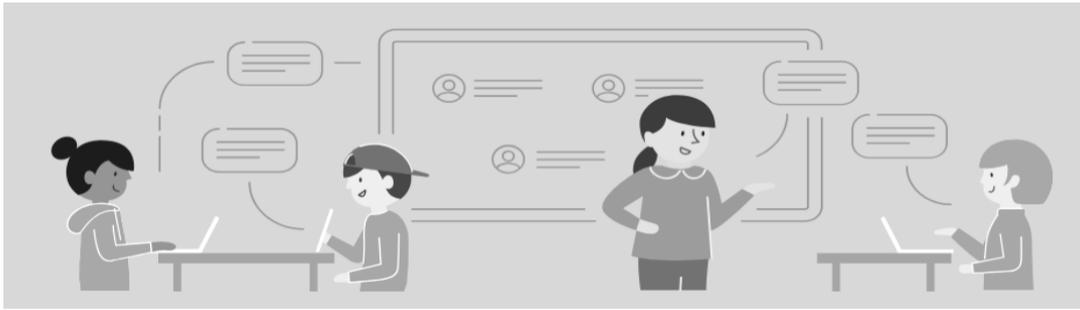
Figure 1: The use of *Talkwall* in classroom interaction

Despite the fact that few studies have examined this type of microblogging in a classroom context, there are findings indicating that the format may enhance engagement and increase participation (Gao, Luo, & Zhang, 2012; Luo & Gao, 2012). Most studies on this type of technology utilise reports on well-established microblogging platforms such as Twitter, which are not designed specifically for conversations. However, some findings show that tweets often help initiate conversations (Gao et al., 2012) and can be used to explore and bring new information into conversations (Thoms, 2012). Research has reported on the benefits of allowing instant feedback and comments, in addition to the main instructions (Li & Greenhow, 2015; Luo, 2015), and an enhancement in academic achievement (Junco, Elavsky, & Heiberger, 2013). The use of Twitter has also been reported to increase on-task talk, the ability to redirect discussions during the activity and the possibility of using the shared representation of tweets to direct final whole-class conversations, which allow for more concrete discussions (Mercier, Rattray, & Lavery, 2015). Luo and Clifton (2017) sought to exemplify how knowledge construction can take place in microblogging-based environments, and they presented a model of Twitter integration into classrooms. Central to the integration of microblogging activities are, for example, exploring hashtags, discussing various topics and participating in live chats, *along* with the primary instruction activity (Luo & Clifton, 2017). This is a type of knowledge-building activity that emphasises knowledge creation in collaboration, while engaged in the microblogging environment, which is similar to the knowledge-building approach presented by Scardamalia and Bereiter (1994). Rasmussen and Hagen (2015) found connections between an increase in subject attainment and the content in microblogs displayed on a shared screen, combined with the students' and teacher's own dialogic elaborations of that content. The microblogs thus made it possible for the teacher to engage with the students' thinking.

When the microblogging tool *Talkwall* is used in the classroom, it creates the possibility to make all students' contributions visible to the whole class; thus, the class can build a collective knowledge base and support knowledge building (e.g., Scardamalia, 2004, 2014), which can be used as a basis for discussion or further development. In this way, the tool can be advantageous in the teaching of dialogic skills.

Teaching dialogic skills

The way in which teachers act and structure classroom activities can make a powerful contribution to student development, both as collective and individual thinkers. For students to develop this ability, they need to be involved in thoughtful and reasoned dialogue (Mercer, 2002). In this work, the teacher can model useful language strategies and, with questions, guide students towards giving reasons and reflections for their views or actions. These strategies can help students in both sharing their views and in modelling how to use language to compare, debate and look at different perspectives. This type of experience is something students can get from dialogic teaching (Mercer, 2002; Mercer & Littleton, 2007). The teaching is dialogic when both teachers and students make substantial and significant contributions, and there is a means of advancing students' thinking on an idea or theme. According to Alexander (2004), this type of teaching is intended to highlight the ways in which teachers can encourage students to participate actively by supporting their ability to articulate, reflect on and modify their understanding.

When students are taught dialogic skills, they perform better in critical thinking, collaborative problem solving and reading comprehension (Howe & Abedin, 2013; Kuhn, 2015; Lawerence & Snow, 2010; Mercer, 2013), and one important predictor of students' learning appears to be the quality of classroom discussion (Gamoran & Nystrand, 1991; Murphy, Wilkinson, Soter, & Hennessey, 2009). Dialogic skills refer to a specific use of language, used as a tool to enable understanding of each other's knowledge and perspectives. It is a way of reasoning, which creates an understanding based on one's own perceptions, while allowing other ideas and opinions to adapt or integrate into one's own thinking. Participants in dialogue – in this case, conversations with a particular purpose and character – can think together and construct new knowledge together (Mercer, 2000). This type of collective knowledge creation bears similarities with the knowledge-building perspective introduced by Scardamalia and Bereiter (1989). Knowledge Forum (Scardamalia, 2004), a technological platform that builds on the knowledge-building concept, is an environment that supports work with ideas in collaboration. This is an

environment in which participants have the possibility to solve problems and reason collectively by building on each other's notes and where others can criticise or contribute to the improvement of ideas. *Talkwall* builds on a similar intention, and the technology supports the production of collectively created ideas and the possibility of contributing to the improvement of others. In addition, *Talkwall* can support face-to-face classroom interaction, with its hybrid characteristics and the possibility of organising ideas, in both a timely and spatial manner.

From a socio-cultural perspective, the role of classroom dialogue has a significant impact on how we understand students' knowledge structure, and students can be taught how to make effective use of spoken language as a cultural and psychological tool. Despite the fact that research clearly shows a connection between the quality of classroom discussion and school development (Alexander, 2012; Mercer, 2013; Mercer & Howe, 2012), some findings suggest that such discussions rarely occur in the classroom (Applebee, Langer, Nystrand, & Gamoran, 2003). In many cases, teachers who believe that they facilitate rich discussions are often, in reality, simply using the well-known Initiation-Response-Feedback (IRF) structure (Cazden, 2001; Wells, 1999). This three-turn sequence is well documented in the educational literature and is both recognised as having an important role in guiding students' learning (Mercer, 2002) and criticised for favouring teacher dominance in the dialogue (Lemke, 1990). It has also been recognised by researchers that the three-turn sequence assumes a diverse role and complexity, which is neither positive nor negative, but that its value depends on the purpose it is meant to fulfil (Erickson, 1992; Lee, 2007). According to Lee (2007), the third turn in the IRF structure, the teacher's evaluation or feedback, represents an extraordinary space, in the sense that it puts forward the unforeseen variety of actions carried out by the teacher, depending on the students' second turn. This third position turn can be used to perform complex pedagogical actions such as steering the direction of a sequence or making hearable or visible the focus of the teaching point (Gardner, 2013). Teacher reformulations in classroom interactions have received attention within educational research. According to Mercer (2002), teachers often rely on techniques such as *recaps* or reformulations to, for example, making links between the past, present and future, which can help students build new understandings beyond the foundations of their previous learning. In addition to supporting students' sense-making, the teacher, by encouraging students to draw on, for example, the expertise of previous activities, can also *help students learn how language can be used as a tool for making joint, coherent sense of experience* (Mercer, 2002).

In this paper, the focus is on teaching design and how students can be taught dialogic skills through the integration of the digital technology tool, *Talkwall*, alongside the use of various resources used as structuring tools in the classroom. What this study seeks to explore is the multimodal aspect and integration of the multiple resources in the task design.

Data and methods

The DiDiAC project has a design-based approach based on collaboration between teachers, researchers and technology developers. All the interventions in this project take place in the classroom context, and interventions and tools develop in interaction with practice (Anderson & Shattuck, 2012). The data consist of video from classroom situations, audio recordings of interviews and classroom observations. The material from the teacher, used as an example in this paper, consists of three hours of research lessons in the subject 'Norwegian language and literature' in a primary school class of 11-12-year olds. After examining the data, there were several occasions in which the teacher quite explicitly focused on the students' way of using talk as a tool for learning. There were also numerous situations in which *Talkwall* was used to recap or reformulate the students' contributions in the whole-class discussions. To present central aspects of the diverse use of *Talkwall*, I have chosen two excerpts for the present analysis and will explore how the teacher used reformulations to support and focus on the students' development of dialogic skills through the use of an interaction analysis (Jordan & Henderson, 1995) of these excerpts. To capture not only what is said, but also details of how something is said, such as visible behaviours and other features of the delivery of talk – which is a key insight of interaction analytic research (Hepburn & Bolden, 2013) – Jefferson (2004) developed detailed transcript conventions for representing talk. In this paper, the transcripts include only the most central details for this level of analysis, such as overlaps and gestures.

Analysis

To present some of the ways in which this teacher integrates multiple resources in order to focus on the development of dialogic skills, two excerpts from the same class were used as examples. The class created ground rules for talk as part of the project intervention. The students were explicitly taught about *exploratory talk*, which is a way of interacting that emphasises reasoning, the sharing of relevant knowledge and a commitment to the collaborative endeavour (Mercer, 2002). The class and teacher agreed on a set of ground rules for talk. The ground rules are examples of suggested strategies used as scaffolds to promote dialogic skills (Rojas-Drummond et al., 2003). The class agreed on these rules by choosing and discussing what they found most important from a list of suggestions. The rules were made visible to the students in several ways, for example, they were written on posters that were always visible to everyone in the classroom or were shown on the whiteboard during group discussions. They focused on two-three rules at a time. In this lesson, the focus was on *being a good listener* and *building on*

each other's ideas. In different ways and situations, the teacher reminded the students about these rules on several occasions during the lesson. For example, she pointed to the rules on the wall, physically moved the posters with the rules closer to the students and made mention whenever they followed the rules. When the students worked in groups, they were usually in groups of three and were encouraged to use exploratory talk when they worked with the different activities. The teacher in this class acted as a model and guide for the use of exploratory talk. She also used reminders to support the talk both in groups and whole-class discussions and prompted the students, both in writing and orally, through digital or analogic means. The analysis of the two excerpts are structured as following: a) description of the context of activity; b) excerpt text; c) description of the interaction and d) description of the teacher's strategy.

Reformulating dialogic skills

In this episode, the teacher is making the dialogic skills explicit through reformulations. The following excerpt (excerpt 1) is from a whole-class discussion in which the teacher and students discussed whether or not the words they were focusing on had a negative or positive meaning. The task was an exercise for subsequent work on writing speeches for two different famous people. The teacher wanted the students to reflect on the context in which words occur, to whom the words are supposed to communicate, who the talker is and so on. This was followed by a whole-class discussion in which the teacher asked the students what they thought about when they heard the expression 'little trolls'. Before the ensuing discussion, the students discussed the words in groups of three. This excerpt is from a student's contribution to the whole-class discussion about the different meanings words can have.

Excerpt 1: Making dialogic skills explicit trough reformulations

```
1   Teacher:  Andy wanted to say? ((points to Andy))
2   Andy:     Im thinking in a way that little trolls can be an
3             positive, because let's say that elderly people can
4             say-  they or uh grandmothers, grandparents can
5             say it like what's it called just express it
6             positive. [but
7   Teacher:           [Yes.
8   Andy:     Maybe other people when they say that to you maybe they
9             mean something negative. [But
10  Teacher:                          [Uhm
11  Andy:     I believeit can be both.
12  Teacher:  Mhm. Now you are building on what both Camilla and Lina said
13            right? Elaborating on what they said. ((points at the
14            Camilla and Lina))
```

In this student contribution, Andy first expresses that the word can be positive and proceeds to provide an example of this about how grandparents can use it in a positive sense (lines 2–6). He then adds that 'other people' can say this in a negative way (lines 8-9) and concludes with his own opinion that it can embody both meanings (line 11). The teacher then makes a point of Andy's contribution as building on what others had said before him (referenced as Camilla and Lina in line 12) and that he is also *elaborating* (lines 12–14). This is a method of reformulation that references the ground rules of talk, which the class had focused on for a long period of time. The teacher recognises the students' contribution as important to the whole class, but instead of giving feedback on the content, the feedback relates to the way in which the student is making his contribution. By uttering "mhm" (line 12), she is confirming that he is right, but instead of using this third turn to elaborate or summarise, she is elucidating to the whole class that what Andy has just done was to build on and elaborate what others had said before him.

This was a typical strategy used by this teacher throughout the material. She explicated, pointed out and modelled dialogic skills for the students in different situations, using multiple resources. The excerpt shows her using a reformulation to reference the student's contribution as more than just the subject-specific goal. The teacher, in addition to approving the student's answer, explicates to both the student and the whole class what the student actually does – he *builds on* and *elaborates* (lines 12–14), which goes back to the beginning of the lesson where she reminded them of the rules of talk. Other strategies used by this teacher to model dialogic skills included referring to posters on the wall or through the use of *Talkwall* contributions. The teacher's way of making the elaboration and building on each other's ideas, visible through language or other resources, plays an important role in guiding the students' learning of dialogic skills (Mercer, 2002).

Making ideas available through Talkwall

In this episode, *Talkwall* opened up the possibility of building on each other's ideas. The next excerpt is from a lesson in which the students were taught about the differences between an opinion and a fact in the subject 'Norwegian language and literature'. For homework, the students contributed to *Talkwall* five things that they cannot live without. Back in the classroom, the students were discussing the *Talkwall* contributions in groups of

three. The group task was to hashtag the different contributions with #opinion or #fact. Before the group could do this, they had to engage in discussion, and the teacher pointed out questions they were supposed to ask each other in the groups. The questions were 'Why do you think that this is a fact?' and 'Why is this an opinion?' These questions were visible on the whiteboard throughout the group discussion. When all the groups had hashtagged the *Talkwall* contributions, the teacher started a whole-class discussion (Figures 2 & 3). One group hashtagged #clothes as an opinion. The teacher asked the group to elaborate on why they chose the specific hashtag and what they discussed the most.

Figure 2: *Talkwall* on both students' ipads and on the whiteboard

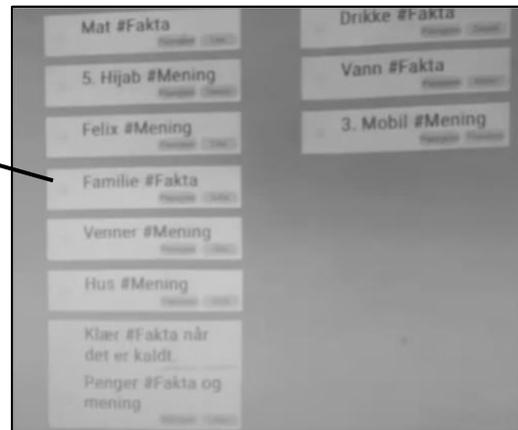

Figure 3: Student contributions on *Talkwall* with #fact or #opinion (Norwegian; #fakta #mening)

Excerpt 2: Using Talkwall as a starting point for building on the ideas of others

```
1    Teacher:  Clothes. Yes, Yes. Tell us about this.
2    Lina:     Because, if no one in the world had clothes then it
3              would not be like it would be strange.
4              But you would survive without clothes. But we could say that it
5              is a fact because clothes are something that we use to
6              protect the body. So, it depends a bit on where you live
7              in the world.
8    Teacher:  Yes. Good. Cindy, did you have a comment to this?
9              ((points to Cindy))
10             (1.0)
11   Cindy:    Uh I think clothes is a fact because you need clothes. But
12             you can cover yourself in a plastic bag. But you cannot
13             run around naked. You need clothes to cover the body. To
14             protect it from snakes and so on.
```

In excerpt 2, the student groups posted their contribution to *Talkwall*, and the teacher asked a group to share the topic that they had discussed the most. One group member responded that it was clothes. The teacher then displayed their *Talkwall* contribution on the whiteboard and encouraged her to tell the whole class about this discussion (line 1). The student then pointed out that clothes could be an opinion because you can survive without them, but conversely, they could be a fact because we need to protect the body. The student then concluded that it depends on where you are in the world (lines 2–7). In *Talkwall*, the group wrote that they are a fact when it is cold. The contribution was displayed to the whole class on the whiteboard, and other students signalled to the teacher that they wanted to comment on this contribution. The teacher selected one student to comment, who said that clothes are a fact because you cannot run around naked (line 13) and that you need clothes to protect yourself from, for example, snakes (line 14). Thus, the student in this turn elaborated on what the other student had said and *built on* the *Talkwall* contribution.

In this excerpt, the teacher used the third position in the IRF structure to include other students to comment on the *Talkwall* contribution. What the student then did was to build on the ideas expressed in the contribution and elaborate on the reason that clothes are a necessity. *Talkwall* was a central starting point for the discussions in this activity, both in the groups and the whole-class discussion. In the group activity, the students discussed and agreed on how to hashtag their opinions about the five things they could not live without. In the whole-class discussion, the groups' contributions were available for everyone to read; thus, they had the possibility to read all the opinions of their peers. One of the rules of the lesson was to build on each other's ideas. The *Talkwall* technology made this possible by reifying the students' ideas in written text, thus making the contributions visible to all and available to build on.

Conclusion and further research

This paper explored how students in a Norwegian 7th grade classroom are taught dialogic skills through their teacher's modelling and explicit focus on *'how to talk'.* Through an examination of two excerpts, the paper sought to allude to examples of a practice that can enhance the development of students' dialogic skills. By paying attention to the third position in the IRF structure, this paper explored the usefulness of the third turn in, for instance, making visible the focus of the teaching point, such as explicating how to build on each other's contributions (Gardner, 2013).

Another aspect was how the microblogging technology can be integrated as a resource to elucidate both how to build on each other's thinking *and* to enhance engagement and increase participation (Gao et al., 2012; Luo & Gao, 2012). The technology in the microblogging tool *Talkwall* opens up the possibility for more students to participate, thus increasing the potential for building on the ideas of others. To be beneficial, the use of technology in the classroom needs to be integrated into the teacher's curriculum and task design (Dillenbourg et al, 2009). *Talkwall* mediates in a hybrid manner, a combination of oral and written contributions, which permits the tool to be integrated with the task design and allows for other resources to be included. In the examples presented in the analysis, the teacher's role of modelling the use pf multiple resources represents how students can be taught dialogic skills. The teacher in this study used *Talkwall* as a tool to support both whole-class and group discussions. The way it was used in this teacher's practice illustrates the potential of using this type of hybrid tool because it can be integrated into face-to-face discussions and enhance the dialogic aspect of the activity.

References

Alexander, R. (2004). *Towards dialogic teaching: Rethinking classroom talk.* Cambridge: Dialogos.

Alexander, R. (2012). *Improving oracy and classroom talk in English schools: Achievements and challenges.* Retrieved from http://www.robinalexander.org.uk/wp-content/uploads/2012/06/DfE-oracy-120220-Alexander-FINAL.pdf

Anderson, T., & Shattuck, J. (2012). Design-based research: A decade of progress in education research? *Educational Researcher, 41*(1), 16–25.

Applebee, A., Langer, J., Nystrand, M., & Gamoran, A. (2003). Discussion-based approaches to developing understanding: Classroom instruction and student performance in middle and high school English. *American Educational Research Journal, 40*(3), 685–730.

Cazden, C. B. (2001). *Classroom discourse: The language of teaching and learning* (2nd ed.). Heinemann: Portsmouth.

Dillenbourg, P., Järvelä, S., & Fisher, F. (2009). The evolution of research on computer-supported collaborative learning: From design to orchestration. In N. Balacheff, S. Ludvigsen, T. De Jong, A. Lazonder, & S. Barnes (Eds.), *Technology-enhanced learning: Principles and products* (pp. 3–20). New York: Springer.

Edwards, D., & Mercer, N. (1987). *Common knowledge. The development of understanding in the classroom.* London: Methuen.

Erickson, F. (1982). Classroom discourse as improvisation: Relationships between academic task structure and social participation structure in lessons. In L. Wilkinson (Ed.), *Communicating in the classroom* (pp. 153–181). New York: Academic Press.

Flitton, L., & Warwick, P. (2013). From classroom analysis to whole-school professional development: Promoting talk as a tool for learning across school departments. *Professional Development in Education, 39*(1), 99–121.

Gamoran, A., & Nystrand, M. (1991). Background and instructional effects on achievement in eighth-grade English and social studies. *Journal of Research on Adolescence, 3*(1), 277–300.

Gao, F., Luo, T., & Zhang, K. (2012). Tweeting for learning: A critical analysis of research on microblogging in education published in 2008–2011. *British Journal of Educational Technology, 43*(5), 783–801.

Gardner, R. (2013). Conversation analysis in the classroom. In J. Sidnell & T. Stivers (Eds.), *The handbook of conversation analysis* (pp. 593–611). Oxford: Wiley-Blackwell.

Hepburn, A., & Bolden, G. B. (2013). The conversation analytic approach to transcription. In J. Sidnell & T. Stivers (Eds.), *The handbook of conversation analysis* (pp. 57–76). Oxford: Wiley-Blackwell.

Howe, C., & Abedin, M. (2013). Classroom dialogue: A systematic review across four decades of research. *Cambridge Journal of Education, 43*, 325–356.

Jefferson, G. (2004). Glossary of transcript symbols with an introduction. *Pragmatics and Beyond New Series, 125*, 13–34.

Junco, R., Elavsky, C. M., & Heiberger, G. (2013). Putting twitter to the test: Assessing outcomes for student collaboration, engagement and success. *British Journal of Educational Technology, 44*(2), 273–287.

Kuhn, D. (2015). Thinking together and alone. *Educational Researcher, 44*(1), 46–53.

Lawerence, J. F., & Snow, C. (2010). Oral discourse and reading comprehension. In M. Kamil, D. Pearson, E. Moje, P. Afflerback, & P. Mosenthal (Eds.), *Handbook of reading research* (pp. 320–337). London: Routledge.

Lee, Y.-A. (2007). Third turn position in teacher talk: Contingency and the work of teaching. *Journal of Pragmatics, 39*, 1204–1230.

Lemke, J. L. (1990). *Talking science: Language, learning, and values.* Norwood, NJ: Ablex Publishing Corporation.

Li, J., & Greenhow, C. (2015). Scholars and social media: Tweeting in the conference backchannel for professional learning. *Educational Media International, 52*(1), 1–14.

Lund, A., & Rasmussen, I. (2008). The right tool for the wrong task? Match and mismatch between first and second stimulus in double stimulation. *International Journal of Computer-Supported Collaborative Learning, 3*(4), 25–51.

Luo, T. (2015). Instructional guidance in microblogging-supported learning: Insights from a multiple case study. *Journal of Computing in Higher Education, 27*(3), 173–194.

Luo, T., & Clifton, L. (2017). Examining collaborative knowledge construction in microblogging-based learning environments. *Journal of Information Technology Education: Research*, 16, 365–390.

Luo, T., & Gao, F. (2012). Enhancing classroom learning experience by providing structures to microblogging-based activities. *Journal of Information Technology Education: Innovations in Practice, 11.* Retrieved from

https://www.researchgate.net/publication/255786378_Enhancing_Classroom_Learning_Experience_by_Providing_Structures_to_Microblogging-based_Activities

Mercer, N. (2002). *Words and minds: How we use language to think together*. London and New York: Routledge.

Mercer, N. (2008). The seeds of time: Why classroom dialogue needs a temporal analysis. *The Journal of the Learning Sciences, 17*(1), 33–59.

Mercer, N. (2013). The social brain, language, and goal-directed collective thinking: A social conceptual of cognition and its implications for understanding how we think, teach, and learn. *Educational Psychologist, 48*(3), 148–168.

Mercer, N., & Howe, C. (2012). Explaining the dialogic processes of teaching and learning: The value and potential of sociocultural theory. *Learning, Culture and Social Interaction, 1*(1), 12–21.

Mercer, N., & Littleton, K. (2007). *Dialogue and the development of children's thinking: A sociocultural approach*. London and New York: Routledge.

Mercier, E., Rattray, J., & Lavery, J. (2015). Twitter in the collaborative classroom: Micro-blogging for in-class collaborative discussions. *International Journal of Social Media and Interactive Learning Environments, 3*(2), 83–99.

Murphy, P. K., Wilkinson, I. A. G., Soter, A. O., & Hennessey, M. N. (2009). Examining the effects of classroom discussion on students' comprehension of text: A meta-analysis. *Journal of Educational Psychology, 101*(3), 740–764.

Rasmussen, I., & Hagen, Å. (2015). Facilitating students' individual and collective knowledge construction through microblogs. *International Journal of Educational Research, 72*, 149–161.

Rasmussen, I., & Ludvigsen, S. R. (2010). Learning with computer tools and environments: A sociocultural perspective. In K. Littleton, C. Wood, & J. K. Staarman (Eds.), *International handbook of psychology in education* (pp. 399–433). London: Emerald Group Publishing Limited.

Rasmussen, I., & Lund, A. (2015). Læringsressurser og lærerrollen – et partnerskap i endring? *Acta Didactica Norge*.

Rasmussen, I., Lund, A., & Smørdal, O. (2012). Visualisation of trajectories of participation in a Wiki: A basis for feedback and assessment? *Nordic Journal of Digital Literacy, 1/2012*, 21–35.

Rojas-Drummond, S., Pérez, V., Vélez, M., Gómez, L., & Mendoza, A. (2003). Talking for reasoning among Mexican primary school children. *Learning and Instruction, 13*, 653–670.

Sacks, H. (1992). *Lectures on conversation* (Vols. I & II) Oxford: Backwell.

Scardamalia, M. (2004). CSILE/Knowledge Forum®. In A. Kovalchick & K. Dawson (Eds.), *Education and technology: An encyclopedia* (pp. 183–192). Santa Barbara: ABC-CLIO.

Scardamalia, M., & Bereiter, C. (2014). Knowledge building and knowledge creation: Theory, pedagogy, and technology. In R. K. Sawyer (Ed.), *Cambridge handbook of the learning sciences* (pp. 397–417). New York: Cambridge University Press.

Scardamalia, M., Bereiter, C., & Lamon, M. (1994). The CSILE project: Trying to bring the classroom into World 3. In K. McGilley (Ed.), *Classroom lessons: Integrating cognitive theory and classroom practice* (pp. 201–228). Cambridge, MA: MIT Press.

Scardamalia, M., Bereiter, C., McLean, R. S., Swallow, J., & Woodruff, E. (1989). Computer-supported intentional learning environments. *Journal of Educational Computing Research, 5*(1), 51–68.

Thoms, B. (2012). Student perceptions of microblogging: Integrating Twitter with blogging to support learning and interaction. *Journal of Information Technology Education, 11*, 179–197.

Wells, G. (1993). Reevaluating the IRF sequence: A proposal for the articulation of theories of activity and discourse for the analysis of teaching and learning in the classroom. *Linguistics and Education, 5*, 1–37.