Supporting Critical Thinking Skills: Analyzing Teachers' Situated Instructional Activities in Relation to Students' Uptake, Use of Sources, and Talk with Peers

Ingeborg Krange (corresponding author), Kristiania University College, Department of Management and Organization, P.O. Box 1190 Sentrum, NO-0107 Oslo, Norway, mob: +47 91615131, ingeborg.krange@kristiania.no

Ingvill Rasmussen, University of Oslo, Department of Educational Research, University of Oslo, P.O.Box 1092, NO-0317 Oslo, Norway, mob +47 41292451, ingvill.rasmussen@iped.uio.no

Leila Ferguson, Kristiania University College, Department of Management and Organization, P.O. Box 1190 Sentrum, NO-0107 Oslo, Norway, mob: +47 93865459, leila.ferguson@kristiania.no

Hildur Bakkene, Borge Junior High School, Borgeveien 74, 1654 Sellebakk, Norway, mob +47 91646185, e-post: hilbak@fredrikstad.kommune.no

Word count including keywords, references, acknowledgements is 8740

Word count excluding keywords, references, acknowledgements is 7208

Ingeborg Krange is Professor. She has in more than a decade been working with issues regarding science education and how different digital and analogue resources are used to support sense making and teaching. Krange has several publications in international journals linked to science education, medical training, art history and history. Krange works with qualitative methods to explore the transformational role of technologies and media in knowledge practices. Krange is now affiliated with Department of Management and Organization, Kristiania University College, Norway.

Ingvill Rasmussen is professor at Department of Education, University of Oslo. Her research focus on how has digital technology changed the ways that we communicate, make sense of our world and learn from our experiences. Her research includes studies of the role of technology in supporting educational dialogue. Rasmussen has, in collaboration with teachers and computer scientists, designed computer tools. One of the main outcomes of this work is the microblogging tool Talkwall.net especially designed to support participation and dialogues in the classroom.

Leila E. Ferguson is professor of education at the Department of Management and Organisation, Kristiania University College, Oslo, Norway. Her research concerns learning and teaching, specifically focusing on beliefs about knowledge and knowing (epistemic beliefs), multiple text comprehension, critical thinking and teacher beliefs.

Hildur Bakkene finished her general teacher training in 2013 and her master's in educational sciences in 2017. Bakkene's master thesis is a qualitative study of how teachers guide students during their work with a writing assignment involving multiple sources. She has worked as a research assistant in a major research project with a focus on qualitative data. The project scrutinized how teachers use different learning resources in the classroom. Currently, Bakkene works as a teacher in a junior high school, where she teaches Norwegian and religion.

Abstract: The aim of this article is to highlight challenges teachers face when helping students develop critical thinking skills in high school history classes. Emphasizing disciplinary interactions, sociocultural theory is used as an analytical lens to investigate teachers' instructional activities in relation to students' uptake, use of sources, and talk with peers. The data were gathered from two history classes led by two different teachers. Our analysis shows that, while many students manage with the help of teachers, peers, and sources, others apparently accomplish very little. Based on these findings, we discuss challenges and implications teachers must face when supporting critical thinking skills in a diverse student population. We emphasize the need to expand on teachers' pedagogical repertoire to help students partake in our information-rich society.

Keywords: Critical thinking skills, instructional activities, productive disciplinary interactions, history education, interaction analysis

Introduction

This paper focuses on the challenges teachers face when helping students develop critical thinking skills in history. The need to teach students to think critically is more evident now than ever due to the amount of information citizens face and highly varied quality of this information (Ferguson & Bubikova-Moan, 2018). Without sufficient critical thinking skills—that is, special expertise in source identification, source assessment, and the ability to integrate information across sources, including those that do not support one's own assumptions—citizens are more vulnerable to manipulation today than they were just a couple of decades ago. The lack of skills needed to take a critical stance in relation to (unreliable) information, 'fake news', and 'alternative facts' may hamper citizens' decisions about what and whom to trust. We focus on teachers' work in guiding students' construction of knowledge and understanding (Mercer, 1995) in this important area by analyzing talk between teachers and students, students' use of sources, and students' talk with peers.

The current and future challenge of critically making sense of different kinds of sources is central to the subject of history. Central to history education is learning how to read, question, contextualize, and analyze multiple sources, since different source offer different stories about the same event (Wineburg, 1991). However, studies have shown that achieving such skills in history is not at all straightforward. There is no longer one book defining what students are meant to read; rather, students are expected to identify relevant sources on the internet (which can be challenging) and to develop strategies to evaluate these identified sources. In a recent study, van Boxtel and van Drie (2013) documented that it is not sufficient to identify multiple relevant sources because students find it hard to integrate this information. Therefore, students' knowledge tends to remain at a factual level, such that they believe learning history is about remembering facts, rather than reasoning and making sense of facts.

Research on the interactional accomplishments required to support the development of critical thinking skills has not received much attention, and even less consideration has been directed towards interactions with and between students who are not highly motivated or engaged in identifying and evaluating different sources for school projects in history. In this paper, we take a sociocultural approach to scrutinize students' development of critical thinking skills because this approach emphasizes an interactional focus (Vygotsky, 1978; Wertsch, 1991). This allows us to not only follow teacher–student and student–student interactions, but also explore how students identify and make sense of potential sources. To accomplish our objectives, we analyzed interactions between two teachers and their students from two high school history classes working on a four-week project designed to develop the students' critical thinking skills.

The article is structured as follows. We begin by clarifying our socio-cultural approach to sense-making and learning and follow up by clarifying our position on critical thinking skills (Abrami et al., 2015). In this section, we clarify some of the concepts we use to approach the development of critical thinking skills and how our work addresses gaps in previous studies. We argue for the relevance of research investigating what are called *productive disciplinary interactions* (Krange, 2007a, 2007b; Stenning et al., 2002), a term that refers to interactions that are productive because the students are making disciplinary progress during their problem-solving activities. Thereafter, we clarify our methodological considerations and conduct an in-depth study of two different orientations towards teachers' instructional activities, students' use of sources, and students' talk with peers. The analyses are followed by a discussion of the challenges and implications teachers face when supporting critical thinking skills in a diverse student population and a call to expand teachers' pedagogical repertoire to help students partake in our information-rich society.

A Sociocultural Approach to Critical Thinking Skills

The sociocultural interpretation emphasizes that learning is fundamentally social and commonly explores learning as an interactional accomplishment mediated by various cultural tools. In this article, we build on the works of Cole (1996) and Holland et al. (1998), who emphasize that students and their teachers bring different identities, motivations, and expertise into the learning setting. Students' sense-making is informed by who they are, their previous experiences, and how they orient to their teachers' instructional activities, disciplinary issues, available sources, and their peers. Within this kind of interpretation, one fundamental question concerns how critical thinking skills emerge as a mutual activity.

Thinking as Dialogue

Based on our socio-cultural and dialogical position, teaching critical thinking is not "one size fits all" (Krange et al., in press); rather, it is dependent on the teacher, the student, and their shared efforts in making previous experiences and cultural tools relevant during problem solving. In short, successful instruction is not simply a matter of adopting "correct" instructional processes and, thus, producing a desired outcome in student learning. However, some teaching strategies are more promising than others when teaching critical thinking skills. For example, in their meta-analysis of strategies for teaching students to think critically, Abrami et al. (2015) identified some useful generic techniques such as dialogue, authentic situations, and mentorship. Dialogue can occur between individuals, in groups, and in whole-class settings, in which the involved actors may discuss some sort of problem. Authentic situations might include ethical dilemmas, role-play, or real-life problems relevant to the students. Finally, mentoring addresses the need for interactions between experts and novices and can include both typical teacher–student relations and interactions between more and less competent peers. Further, there is a distinction between generic techniques for fostering critical thinking skills and the need for subject-specific guidance, in which generic techniques inform subject-specific ones and the teacher's role involves making the generic relevant in a didactic setting. Considering critical thinking skills in history, this points towards challenges in making sense of different sources, such as multimodal and multiple texts.

Educational research has shown that the metaphor of thinking dialogue is productive (Wegerif, 2018). This approach to teaching critical thinking lies behind several programs that have been successful (see Howe & Aberdeen, 2013; Resnick & Schantz, 2015). *Dialogue* and discussion can stimulate contrasting ideas and foster a focus on the most relevant issues in the encountered information sources. Several researchers have empirically investigated the teaching of critical thinking skills, arguing for a dialogic approach as a way of increasing learning opportunities (e.g. Howe & Abeden, 2013; Murphy et al., 2016). For example, research on *exploratory talk*, in which participants are encouraged to engage critically but constructively with one another's ideas, suggests that peer-group interactions can be developed to improve students' *critical thinking skills* (Kumpulainen & Wray, 2002; Mercer et al., 2004; Rajala et al., 2012),

Literacy research, which focuses on readers' sense-making when faced with several information sources that address a single issue (as is often the case in the domain of history), has documented that comprehending multiple texts is challenging for students in schools and universities alike (see Strømsø, Bråten, Britt, & Ferguson, 2013). Students struggle to identify key information within and across text(s), reconcile conflicting information, or use information sources in their own texts. The extant research unanimously documents that students need explicit instruction on how to use source information and integrate information from different texts, underlining the crucial role of the teacher in fostering such skills (Anmarkrud, Bråten, & Strømsø, 2014; Braasch et al., 2013; Stahl et al., 1996).

Productive Disciplinary Interactions

Research on productive disciplinary interactions focuses on how students problematize disciplinary issues, take authority to do so, or become disciplinarily accountable in different ways (Engle, 2006, 2007; Engle & Conant, 2002; Krange, 2007a, 2007b; Rasmussen, Krange, & Ludvigsen, 2003; Stenning et al., 2002). Despite some differences, all these interpretations emphasize the need for systematic training in thinking skills and stress the importance of educating students in how to verify claims. They also emphasize that teachers' role in the development of these skills is crucial throughout students' learning trajectories, particularly in technology-rich learning environments, due to both the extensive amount and the varied quality of the information students find online (Arnseth & Krange, 2016; Braasch et al., 2013; Furberg & Rasmussen, 2012; Krange & Ludvigsen, 2008). Moreover, it is important to emphasis that productive disciplinary interactions cannot be decided a priori. Rather, these types of interactions emerge gradually throughout students' problem-solving activities. Studies have found, for example, that students use half of the available time just to understand a task (Krange, 2007a; Rasmussen, Krange, & Ludvigsen, 2003). However, it is important to mention that, although this first part of students' problem solving might appear unfocused, it actually involves several important delimitations and the testing of different strategies for solving the task.

Aim and Research Questions

The aim of this article is to investigate the challenges teachers face when helping students develop critical thinking skills. Following a sociocultural perspective, we analyze teachers' situated instructional activities and how critical thinking skills emerge as a mutual process that involves both 'teaching' and 'learning', asking the following questions:

How do students interpret, follow, challenge, or struggle to make sense of teachers' instructional activities, and how do students identify, make sense of, and elaborate on sources with their peers?

Data and Methods

Participants

The study sample comprised two teachers and 56 students equally divided between the two classes. All students had completed vocational education and were, at the time of the study, attending a one-year supplementary program particularly developed for students with this background to obtain a general university and college admission certification. The studied year is considered a challenging year for many, and the dropout rate is higher than in other study

programs (Utdanningsdirektoratet, 2014). Analyses have suggested that the high dropout rate is linked to a higher degree of weak junior high school results among the students taking part in this study program (Markussen, 2010; Markussen & Sandberg, 2005). The data are part of a larger project (Gilje et al., 2016).

Task

The project we follow occurred at the end of the study year and was designed to prepare the students for their final exam, which was due in two months' time. The teachers collaborated on both the instructional design and the task design. The overall theme was to develop the students' critical thinking skills, the topic chosen to accomplish this was the Interwar Period, and the task was to write an individual essay. The students were expected to develop an understanding of an ideology (e.g. capitalism, communism, or Nazism) and to identify and interpret at least two sources (online or in the school library) to illustrate it. Within the essay, they were to discuss both how their assigned ideology was expressed in the sources and whether they found the sources to be reliable representations of the specific ideology. The students had four weeks to complete and submit their essay.

The practical set-up for the project period was similar for the two classes. Together, the teachers introduced the theme, the task, and practical aspects of the project. For the rest of the project, the two classes followed separate trajectories. Each class had nine sessions lasting 55 or 110 minutes (total time across both classes = 1600 minutes). Practically, it is worth noting that all students in Norwegian upper secondary schools have their own laptop with internet access, upon which our participants completed the task.

Data

The data were collected as part of a large-scale project called ARK&APP (Paper & Application) (Gilje et al., 2016). The project collected a rich set of data, including: field notes, video recordings, interviews, students' essays, and pre- and post-tests. The *field notes* described the ongoing activities, how much time the teachers and students spent on each activity, and the sources they employed. The *videos* documented the interactional activities in the classrooms. All 1600 minutes of instruction time were video recorded. One camera followed the teachers, and one camera followed the group or individual work. The *students' essays* were submitted at the end of the project period and evaluated by the teachers, who gave a summative evaluation and a final grade. The *pre- and post-test* were developed through a collaboration between the researchers and the teachers. The test consisted of four tasks that asked the students to describe what an ideology is using examples, describe their "project ideology," explain what a source is using examples, and finally describe how they would perform a source critique. The students

had 15 minutes to complete the test, and they were informed that the results would not impact their final mark. After the project period, a third, independent history teacher evaluated the tests according to the scoring rubric, which clarified how many points the students could receive for each sub-task in the test. In total, 34 out of 56 students completed both the pre- and post-tests. This relatively low number is representative of attendance for this student group.

Given that our analytical focus is on the interactional work between teachers and students and the variation in students' uptake, referring to how students manage to ask for and make their teachers' supervision meaningful as part of their problem solving, we base our in-depth analyses on the observations documented in the video recordings supplemented by the students' essays. The remaining data are used to frame our analyses and will be explicitly mentioned when used.

Analytical Approach

In an initial analysis, Nvivo was used to store, sort, and identify themes by making and connecting nodes across field notes, video recordings, interviews, and students' essays. Using so-called thematic analysis (Braun & Clarke, 2006) as an analytical tool, we gradually identified two themes concerning teacher–student interactions and how students deal with teachers' contributions during supervision. These themes included students who exhibited productive uptake of supervision and students who struggled with uptake when working to develop their critical thinking skills.

In this paper, we want to take the analyses one step further to scrutinize the actual student–teacher interactions, opening each of the thematic patterns, considering how interactions evolved in connection to the identification and interpretation of sources (e.g. texts, pictures, illustrations, and objects) and eventual discussions with peers, and exploring the implications of these evolutions for the students' final submissions: namely, the essays. To perform this analysis, we draw on a long tradition of interaction analysis supporting an identification of how interactions between participants and available sources evolve moment-to-moment (Derry et al., 2010; Jordan & Henderson, 1995). The selection of episodes follows thematic patterns, and we have carefully chosen what must be considered typical examples of each pattern. Episodes of talk and interactions were translated into English and transcribed using Mercer's (1995) strategy, making the talk and interactions as non-technical as possible to "make them accessible to audiences outside the community of language researchers" (pp. vii–viii).

Finally, we used the students' essays to scrutinize the ways in which the students followed up on the teacher's guidance concerning source criticism when writing about sources. In this part of the analysis, we searched the essays for the use of certain keywords that had been explicitly articulated during the supervision episodes.

Analyses and Findings: Teacher Guidance and Student Uptake

In the following analyses, we zoom in on the three episodes selected for closer examination. Two are meant to illustrate typical student uptake within each of the thematic patterns (episode 1 and 3), and an additional episode is used to exemplify how students with productive uptake manage to elaborate their work with peers (episode 2).

Productive Uptake

Now, we are going to meet Steinar. He is in the back row of the classroom. Based on the analysis of the video data and our field notes, it is reasonable to describe him as engaged in the subject. For example, he initiates conversations following up on topics initiated by the teacher. He also frequently takes part in whole-class discussions. Steinar is supervised four times during the learning trajectory, each time focusing on source use. He writes about capitalism and is looking for sources that can negatively and positively enlighten this ideology. The essay is written during the very last days of the project period. Steinar gets the best grade possible on his essay.

We enter the data at the first time Steinar takes part in supervision. This is the third lecture of project period. Steinar has found a source on internet and shares the source with the teacher.

Figure 1 Steinar's source on capitalism gathered from an internet site called EnglishRussia.com

Episode 1: It is not that difficult to see

1	Steinar:	That is one of my sources.
2	Teacher:	Yes, yes, yes. Very well. Where is that source from?
3	Steinar:	Is that difficult to see?
4	Teacher:	It is difficult to see.

5	Steinar:	Mm, eh …
6	Teacher:	Well, but that is part of your challenge, that it preferably should be a source that you can trace back. Is this from the interwar period, or is it contemporary?
7	Steinar:	*Interrupts the teacher* It is contemporary because it is from this website. *Short pause while Steinar finds the website where he found the picture* (*EnglishRussia).*
8	Teacher:	What is the name of the site, what is written?
9	Steinar:	EnglishRussia.com *Laughing*
10	Teacher:	Yes. What can that tell you about the source's origin and trustworthiness? And presentation?

This short talk starts with Steinar sharing a source with his teacher (utterance 1). The teacher confirms its relevance and asks where the source is from (utterance 2). Steinar replies by questioning whether that information is difficult to see (utterance 3), and the teacher says that it is (utterance 4). Steinar seems to hesitate a bit, waiting for the teaches to continue (utterance 5), and the teacher elaborates, saying that the source needs to be traceable and dated (utterance 6). Steinar interrupts eagerly, claims that the source is contemporary, and identifies the website (utterance 7). The teacher continues to add questions to help Steinar identify the source, asking for the name of the website (utterance 8). Steinar replies by noting the name of the website (utterance 9). The teacher confirms again and further specifies his questions about the source, including its origin, its trustworthiness, and whether there is something peculiar about its presentation (utterance 10).

This short extract is about source criticism. Steinar and the teacher have a friendly tone, and the teacher pushes Steinar to consider the quality of the source by sharing different clues about how to consider quality without giving the right answer. The key phrases concern where the source is from, the importance of using traceable sources, the date of the source, the name of the website, what its origin is, whether the source is trustworthy, and whether there is something peculiar with the presentation. Steinar, as a representative for the students with productive uptake of teachers' instructional activities, elaborated on the teacher's utterances by confirming and further developing them. Moreover, in how he builds on the teacher's utterances, Steinar makes sense of the input and advice he has received and shows that he is familiar with this type of talk through how he acknowledges the teacher and contributes to the utterances by questioning, confirming, and contributing with source information. It is not clear from this short episode what Steinar knows about capitalism beforehand; however, he demonstrates that the educational situation is authentic and recognizable to him. Finally, it is worth highlighting how close the teacher is to Steinar's topic and source identification. All the teacher's guidance takes the selected source as a point of departure to make the more generic criteria for source criticism relevant to Steinar's individual project.

However, from this short sequence, it is not possible to say whether Steinar followed up on these clues. Therefore, we turned to Steinar's submitted essay to see whether he used the picture and whether he employed some of the criteria for source criticism to evaluate the source. Steinar writes: "The Soviet image is a subjective view on capitalism, seen from one side. Several pages with Russian text had this kind of view, so it is fairly sure that it at least is Russian." Steinar does not know anything about the source's origin or background, but he is

aware that the source is subjective and unilateral in its view on capitalism. He continuous to write:

> The source presents capitalism as a greedy society where people only care about themselves and their people. The trustworthiness of the source is really discussable, because there are both greedy capitalists who only want to maximize what is best for themselves, and capitalists like Bill Gates that gives LARGE amount of their wealth to poor people and to research. I would suggest that it is correct in some incidents.

Steinar's uptake from the supervision is obvious. He discusses the source origin and whether it is trustworthy; then, based on this discussion, concludes that this source's view on capitalism is fair in some cases, but not all. Steinar problematizes disciplinary issues, takes authority to evaluate different validity issues regarding the source, and becomes disciplinarily accountable when working with the essay.

Typically, students who are productive in their uptake of the teachers' instructions also later clarify and develop the ideas discussed with the teachers in collaboration with peers. Episode 2 is selected to illustrate such an interactional setting. Sander and Jens are sitting next to each other, and both are going to write about Nazism. Sander has just had a productive talk with the teacher clarifying some issues regarding sources and narrowing his focus, while Jens has listened. We enter the data immediately after the teacher has left.

Episode 2: How should we do it?

1	Sander:	Should we explain how we are going to solve the task ... what it means or what it has been or what ... how are we going to do it?
2	Jens:	Ehm, identify all the information you can from that picture, right.
3	Sander:	Yes, yes, yes.
4	Jens:	And then you use ... for example, you use his speech to show how Hitler ... really got the power to manipulate, using his words to manipulate further. Or how he used, for example, symbols, historical symbols like that eagle …
5	Sander:	Mm …
6	Jens:	… to make some recognition through history and such kinds of things, how he always had ... he had the people behind, the assembly, right.
7	Sander:	Yes ... yes ...

Sander turns to his peer, Jens, to further confirm how to solve the task (utterance 1). Jens builds on what the teacher has said and explains that they need to identify all the information they can get from the picture (utterance 2). Sander confirms, but does not contribute to any further interpretations (utterance 3). Jens, on the other hand, continuous to explain and exemplify with a possible interpretation of Hitler as a speaker and a discussion of how Hitler used symbols to substantiate his position (utterance 4). Again, Sander simply confirms (utterance 5). Jens follows up from the previous statement and gives details about how symbols can be used across historical events fostering meaning for the people (utterance 6). Sander confirms Jens' interpretation (utterance 7).

Two aspects are particularly worth noting. Sander continues the talk he has had with the teacher and invites Jens to further interpret the best way to solve the task. It is Jens who builds on what the teacher has just shared with them, demonstrates his uptake of the teacher's instructions by elaborating on this advice, and continues interpreting the meaning of certain symbols. Further, this short conversation is also interesting because it demonstrates how two equitable peers work together to develop a more elaborate understanding of the problem. They problematize disciplinary issues, gradually take the authority to do so, and become more disciplinarily accountable.

To summarize, the students in this study who follow up on the teacher's supervision also exhibit the competence to partake in productive disciplinary interactions. They manage to make the actual situation authentic, at least with respect to the expectations they meet in supervision settings and how they—at least in this case—have already identified a relevant source by the time the teacher comes over to foster their interpretations. Further, the challenges the teacher faces fit well with his teaching orientation towards the students. By this, we mean that the teacher's questions and how he develops the disciplinary-oriented talk together with the students stimulates the students' productive uptake. Together, they elaborate the interpretation of sources and how to narrow their focus. It is also worth highlighting how close the teacher is to Steinar's topic and source identification. All the teacher's guidance takes the selected source as a point of departure to make the more generic criteria for source criticism relevant to Steinar's individual project. Thus, the teacher's repertoire for teaching works very well for the students with strong uptake. Finally, it is important to mention that other students also become a resource for students with strong uptake, as we see in Sander's and Jens's talk, and can use each other to elaborate on, for example, instructional suggestions or interpretations of sources.

Students Struggling

Emilie represents the group of students who struggle to mobilize engagement and agency. She is often seated in the back row of the classroom. Our observations document that she is among the students using her laptop to do things other than schoolwork (e.g., sneak watch TVseries and video clips, check social media, etc.). Throughout the learning trajectory, Emile is supervised five times one-to-one by the teacher. Independently of when they appear in the trajectory, these conversations are mostly about Emilie not knowing what to do. She writes about communism, and she expresses insecurity about selecting relevant sources. Emilie submits an essay and receives a barely passing grade.

Emilie starts out by reading the pages in the textbook that describe her theme, communism, and follows up by writing some notes in her notebook. When we enter the data, Emilie is in the third week of the project, the 12th day, and is having her last one-to-one talk with the teacher

during the project period. The deadline is coming closer, and she has a week to write up a final version of the essay. The teacher is walking around the class supervising different students, and Emilie asks him for help.

Episode 3: But what should I do about it, then?

1	Emilie:	Can't you just choose something I should write about, then? Just choose something! Then it will be easier for me. That's just something I pressed. *Referring to the data screen.*
2	Teacher:	You have fascism or Nazisme.
3	Emilie:	No, communism.
4	Teacher:	You have communism? *Sounds surprised.*
5	Emilie:	Mm. I have. *The teacher is leafing through the textbook. It becomes silent for about 30 seconds.*
6	Teacher:	There are quite many sources to use here. Eh—this is in Russian, so it is not so easy to understand. But here, we see how Lenin takes away all these capitalists, right. Just away. That can be an example of a view on capitalism. *The teacher is referring to the textbook that they are looking at together. He then turns a page.* Here, we can see the communist view on religion. Here, they simply enter and rob a church and take what is there.
7	Emilie:	*Sigh.* What shall I do with that, then? *Sounds despairingly.*
8	Teacher:	But you have read everything that is written here?
9	Emilie:	Yes
10	Teacher:	Okay, but there was nothing you thought that this is something I like to learn more about?
11	Emilie:	No.

At the beginning of the episode, Emilie receives the teacher's attention and, with her question, reveals that she, after two and a half weeks, still has not started to write up her essay. Her question shows that she is really in the beginning of her work, struggling to identify sources to interpret and use to enlighten her theme (utterance 1). The teacher attempts to recall what theme Emilie had, fascism or Nazism (utterance 2). Emilie rejects his suggestions and corrects them, saying that her theme is communism (utterance 3). The teacher confirms and sounds surprised (utterance 4). Emilie approves (utterance 5). Then, something very concrete happens: something that addresses Emilie's initial question asking for help to identify what to choose. Together, they look through the textbook, and the teacher identifies two potential sources referring to pictures or illustrations—respectively, sources on "Lenin" and "religion"—and starts interpreting each of them (utterance 6). In a despairing voice, Emilie asks what she should do with the issues the teacher offers (utterance 7). The teacher asks if Emilie has read the textbook (utterance 8), and Emilie confirms that she has (utterance 9). The teacher continues and asks if there is something there that she wants to learn more about (utterance 10), and Emilie replies "no" (utterance 11).

This short extract reveals two main themes related to the teacher's use of sources and Emilie's comprehension of the teacher's advice. When the teacher and Emilie start talking, Emilie has still not identified a source. Therefore, the teacher cannot use a source as a starting point for the conversation, as he did with Steinar. First, he needs to clarify what ideology Emilie is supposed to research. This is interesting because it is the fifth time the teacher and Emilie have had a one-to-one talk, and it seems that Emilie's lack of interest "infects" the teacher. However, once the topic is clarified, the teacher turns to the textbook—a source whose validity is easier

for Emilie to interpret than, for example, those of sources identified on the internet. Then, the teacher identifies and starts interpreting different sources, such as sources on Lenin and religion, and exemplifies how they can be used to make sense of communism as an ideology. Emilie, on the other hand, partakes in the talk, but leaves doubt concerning whether she really understands how to make the information and sources in the textbook relevant for her ideology project. Though she has read the pages and the teacher has identified and begun to interpret examples that could work as sources, Emilie still expresses that she does not understand how to make use of the teacher's help. Throughout the project period, Emilie shows limited development in her understanding of what sources are and how their quality can be evaluated. She does not build on the teacher's suggestions concerning how to define and describe communism using references from the textbook.

However, from this short episode, it is not possible to say whether Emilie later followed up on the teacher's suggestions for how to approach communism as an ideology and how to consider the quality of different sources in her essay. Therefore, we turned to her submitted text to scrutinize the ways in which she followed up on the teacher's input. What we found was that she did not build further on the teacher's suggestions. Rather, she performed some new searches on internet and included some uncommented copied-and-pasted text and pictures as if they were her own work. At the end of the essay, she offers some reflections on the quality of the sources she has used and highlights that one of the websites refers to an acknowledged publication house.

It is evident that Emilie struggles with her uptake. She does not follow up on the teacher's suggestions in either the talk or her submitted essay, despite asking him to select sources for her. Rather, she delivers a text that primarily consists of cut-and-pasted elements gathered from two internet sources. The clip arts are not discussed or integrated into the greater argument and are left uninterpreted in the essay. More specifically, while she presents some disciplinary issues, these are not problematized; she demonstrates limited authority when she evaluates the sources; and she does not become disciplinarily accountable while working with the essay. She receives a poor grade.

To summarize, as a representative for the students who struggle with the uptake of the teacher's supervision, Emilie engages in talk characterized by a one-way orientation, in which she fails to elaborate on new facts introduced by the teacher. Typically, students who struggle with uptake have not completed the task of finding sources by the time they talk to the teacher; therefore, when the teacher shows up, they have no shared object to use as a point of departure. When the teacher compensates for this by offering suggestions for validated sources in the curriculum book and proposing that the student could interpret one of these, he receives a limited response, which is only natural when one feels inadequate or faces a challenge. Following guidance in such a situation is difficult, and the interactional work of the teacher is challenging. In our case, Emilie does not follow up on the teacher's advice; rather, she opens the task again and starts over, searching for new sources on internet. For students struggling

with uptake, the teacher's questions, identifications of potential sources, and initial interpretations of these sources do not help to develop their disciplinary knowledge sufficiently or, at least, in a productive direction. Moreover, these students fail to elaborate and further develop ideas or arguments with their peers, implying that they have fewer resources on which to build their knowledge than the more successful students. The challenges the teacher faces do not fit as well with the needs of the students in this group as they do with the needs of those who achieve productive uptake from the supervision.

Discussion: The Need for an Extended Repertoire

This study has focused on the challenges teachers face when supporting students in developing critical thinking skills in history. To accomplish this objective, we have examined how students follow up on teachers' instructional activities, how they identify and make sense of sources, and how they expand on this work and collaborate with their peers. We have demonstrated that the students are divided into two main patterns with respect to how they follow up on their teachers' guidance for developing critical thinking skills: those who respond well and those who struggle to respond.

Understanding the Task

Understanding the task is crucial to solving the task (Krange, 2007a; Rasmussen, Krange, & Ludvigsen, 2003). This finding is supported by our analysis sup the interviews with the students, which showed that they found interpreting sources in history demanding. Interestingly, all students spent most of their time identifying and interpreting the sources describing their ideologies. It was only at the end of the project that they started to write up their essays. The difference between the students who succeeded in their uptake and those who struggled became evident both during problem-solving and in their final essays. The successful students shared their reflections about choice of source(s), potential strengths and weaknesses, and how these were linked to an ideology as part of their talk with the teacher and their peers before writing up their thoughts and findings in their final essays. The struggling students, on the other hand, documented limited reflections concerning the criteria for selecting sources and offered few interpretations of sources both during problem solving and in their essays. Not surprisingly, the first group of students were more successful in making use of the teacher's supervision than those who struggled. It is tempting to speculate that the stronger students' systematic work over time to make sense of the teachers' scaffolds contributed to their development of critical thinking skills, while the struggling students demonstrated few or no such skills.

Participation, engagement and effort are necessary to develop knowledge (Furberg & Rasmussen, 2012) and critical thinking skills (Ferguson & Bubikova-Moan, 2018). Even the student who struggled asked for help and handed in her essay, thus demonstrating a will to solve the task.

In terms of the nature of the task, it seems clear that the students who struggled would gain more in terms of learning strategies through more recipe-formulated tasks with a clearly decided theme and pre-selected relevant sources ready to be interpreted (Bakkene, 2017; Gil, Bråten, et al., 2010). These students would also probably improve by following explicit instructions for how to interpret the sources (Anmarkrud, Bråten, & Strømsø, 2014; Bakkene, 2017). Finally, these students would likely benefit from a predefined essay template from which to structure their work, marking out what types of pictures or illustrations they need and indicating where to add different types of texts explaining and discussing their sources. However, recipes and templates also need to be interpreted and made sense of, and these issues need to be scrutinized further to identify how students who struggle with uptake can be supported in their learning activities. The teacher's contributions to guiding and supporting these students is crucial, and a focus on how students make sense of different types of learning materials may help expand teachers' repertoire for helping these students develop their critical thinking skills.

Individual Relevance

The students' observed engagement varied. However, all students experienced challenges using knowledge presented in whole-class settings in their individual projects (Bakkene, 2017; Rasmussen et al., 2014). This is a well-documented finding in history education. For example, van Boxtel and van Drie (2013) argue that students generally find it challenging to interpret identified sources in history. Students are dependent on their teachers' help to link the more generic interpretation criteria with the disciplinary issues found in the identified sources. Source validation criteria, such as origin, traceability, timeliness, and trustworthiness, are examples of such generic criteria, and to make sense of these, students need help linking these criteria with the sources they are interpreting (List & Alexander, 2017). However, students who succeeded in their uptake managed to make use of this supervision in a completely different way than those who struggled.

Our findings suggest that students who have productive uptake also overcome the challenges of interpreting identified sources simply by using their teachers' supervision and elaborating on suggestions with their peers. In so doing, these students succeed in partaking in disciplinary-oriented dialogue (Abrami et al., 2015), and their talk becomes an integral part of their problem solving when engaging critically and constructively with their teachers' and peers' ideas (Wegerif, 2018). As Stenning et al. (2002) suggested, these students problematize disciplinary issues, take authority when working with these issues, and become disciplinarily accountable.

However, as Anmarkrud et al. (2014) argued, explicit teaching and facilitation are not necessarily sufficiently productive for all students when struggling to develop critical thinking skills. Our analysis indicates that "talk-intensive pedagogies" are only productive for those students who succeed in their uptake; those who are struggling need other types of teacher initiations and follow-up interactional activities. What types of pedagogies these could be must be scrutinized further.

The Danger of Negative Cumulative Development

Productive disciplinary interactions are characterized by a cumulative process in which students take on the authority to be disciplinarily accountable. Our analysis shows that those students who had problems making sense of the teachers' guidance seem to be in danger of a rather different learning trajectory and a negative cumulative development (as also discussed in Bakkene, 2017). These students risked lagging more and more behind their peers in their disciplinary knowledge. These students also struggled to partake in the dialogue, build on the teachers' utterances, bring in new and more specific issues, challenge interpretations, or use these interpretations to say something about an ideology. Their talk tended to remain at the factual level, including few, if any, explorative elements (Wegerif, 2018).

The students' limited subject knowledge led to a mismatch between the students' zone of proximal development and the scaffolding offered by the teacher (van der Pol, Volman, & Beishuizen, 2010; Vygotsky, 1978; Wood, Bruner, & Ross, 1976). When the students hardly know anything about the interwar period and its ideologies or sources, while simultaneously demonstrating that they struggle to mobilize the necessary effort, teachers must take on a different type of repertoire to foster and frame the activity in which the students are meant to partake. The ideologies and sources that are supposed to be starting points to develop critical thinking skills offer no resonance to authentic situations for these students. Moreover, these students demonstrate few meta-cognitive strategies for learning (Anmarkrud, Bråten, & Strømsø, 2014): strategies that could help them endure the challenges of making sense of different types of learning resources (e.g. textbooks or the internet). We argue that teachers need new, alternative strategies to support this group of students and that these strategies need to be further tested and investigated. If not, several students will not be able to take part in the normative educational aim of in-depth learning.

Concluding Remarks and Further Research

The aim of this study has been to identify and discuss the challenges teachers face when helping students develop critical thinking skills in history. By taking a sociocultural approach to learning, we have opened two interactional patterns: students who follow up on their teachers'

guidance and students who have problems doing so. We have also scrutinized how these different orientations influence students' activities and development of critical thinking skills in history. The analyses reveal that all students need teachers' help making disciplinary knowledge relevant for their individual tasks and linking criteria for critical thinking skills with specific aspects identified in their sources.

Students come to class with different motivations and expertise (Cole, 1996; Holland et al., 1998), and this has implications for how they orient to teachers' instructional activities, disciplinary issues, available sources, and peers. Those students who succeed in their uptake of the teachers' supervision are more likely to become part of emerging productive disciplinary interactions and to develop critical literacy skills in history than those who struggle to follow guidance. It is this group of students that raise concern because teachers' repertoire does not work sufficiently well to support this group's development of critical literacy skills in history as a mutually emerging activity.

By analyzing teaching as an interactional activity, we bring attention to the fact that teachers face very different challenges meeting students who succeed with their uptake compared to those who struggle to do so, and that they need different types of tools to succeed with both groups. This is critical because we witness a rather large group of students who do not take part in the normative, educational aim of in-depth learning, and we need to identify ways to break this negative pattern. There is a need to develop potentially new, alternative strategies to support this latter group of students' development of critical thinking skills in history and to further develop teachers' repertoires for supporting this group. These strategies need to improve the relation between teachers' scaffolding and students' zone of proximal development to make them a better match. These initiatives and how they are potentially taken up in interaction need to be systematically scrutinized in future research.

Acknowledgments

This research was funded by The Norwegian Directorate for Education and Training. We would like to thank Associate Professor Anniken Furberg at the Department for Teacher Education and School Leadership, University of Oslo, for fruitful discussions on early drafts.

Declaration of interest statement

There is no conflict of interest to be declared.

References

Abrami, P. C., Bernard, R. M., Borokhovski, E., Waddington, D. I., Wade, D. A., & Persson, T. (2015). Strategies for teaching students to think critically: A meta-analysis. *Review of Educational Research, 85*(2), 275–314.

Anmarkrud, Ø., Bråten, I., & Strømsø, H. I. (2014). Strategisk kildevurdering av multiple tekster: Utbytterikt, men krevende. [Strategic source evaluation of multiple texts: Profitable but demanding]. *Norsk pedagogisk tidsskrift* [Norwegian journal of educational sciences], *1,* 47–57.

Arnseth, H. C., & Krange, I. (2016). What happens when you push the button? Analyzing the functional dynamics of concept development in computer supported science inquiry. *International Journal of Computer-Supported Collaborative Learning, 11*(4), 479–502.

Bakkene, H. (2017). *Læringsforløp og arbeid med multiple kilder—En kvalitativ studie av hvordan en lærer veileder tre elever.* [Learning trajectories and work with multiple sources—A qualitative study of how teachers supervise three students]. Oslo, Norway: Universitetet i Oslo.

Braasch, J. L. G., Bråten, I., Strømsø, H. I., Anmarkrud, Ø., & Ferguson, L. E. (2013). Promoting secondary school students' evaluation of source features of multiple documents. *Contemporary Educational Psychology, 38,* 180–195.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101.

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112,* 155–159.

Cole, M. 1996. *Cultural psychology: A once and future discipline.* Cambridge, MA: Harvard University Press.

Derry, S. J., Pea, R. D., Barron, B., Engle, R. A., Erickson, F., Goldman, R., … Shering, B. L. (2010). Conducting video research in the learning sciences: Guidance on selection, analysis, technology, and ethics. *Journal of the Learning Sciences, 19,* 3–53.

Engle, R. A. (2007). Leadership in the dance of agency during productive disciplinary engagement. *Cultural Studies of Science Education, 2,* 210–218.

Engle, R. A. (2006). Framing interactions to foster generative learning: A situative explanation of transfer in a community of learners' classroom. *The Journal of the Learning Sciences, 15*(4), 451–498.

Engle, R. A., & Conant, F. R. (2002). Guiding principles for fostering productive disciplinary engagement: Explaining an emergent argument in a community of learners' classroom. *Cognition and Instruction, 20,* 399–483.

Ferguson, L. E., & Bubikova-Moan, J. (submitted). Argumentation as a pathway to critical thinking. *Proceedings of the International Society for Studies on Argumentation.*

Furberg, A., & Rasmussen, I. (2012). Faktaorientering og forståelsesorientering i elevers bruk av nettbaserte læringsomgivelser. [Fact-orientation and understanding-orientation in in students' use of netbased learning environments]. In T. E. Hauge & A. Lund (Eds.), *Små skritt eller store sprang? Om digitale tilstander i skolen* [Small steps or big jumps? About digital states in schools] (pp. 23–57). Oslo, Norway: Cappelen Damm Akademisk.

Gil, L., Bråten, I., Vidal-Abarca, E., & Strømsø, H. I. (2010). Summary versus argument tasks when working with multiple documents: Which is better for whom? *Contemporary Educational Psychology, 35(3),* 157–173.

Gilje, Ø., Ingulfsen, L., Dolonen, J., Furberg, A., Rasmussen, I. Kluge, A., … Skarpaas, K. (2016). *Med ARK&APP. Bruk av læremidler og ressurser for lærling på tvers av arbeidsformer*. [With ARK&APP. Use of learning materials and resources for learning across different working settings]. Oslo, Norway: Universitet i Oslo.

Greene, J. A., Copeland, D. Z., Deekens, V. M., & Yu, S. B. (2018). Beyond knowledge: Examining digital literacy's role in the acquisition of understanding in science. *Computer & Education, 117,* 141–159.

Holland, D., Lachiocotte, W., Skinner, D., & Cain, C. (1998). *Identity and agency in cultural worlds*. Cambridge, MA: Harvard University Press.

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

Jordan, B., & Henderson, A. (1995). Interaction analysis: Foundations and practice. *The Journal of the Learning Sciences, 4,* 39–103.

Krange, I., Silseth, K., & Pierroux, P. (in press). Students' sense-making processes on fieldtrips: A study of scaffolding conditions while interacting with epistemic exhibits. *Cultural Studies of Science Education.*

Krange, I., & Ludvigsen, S. (2008). What does it mean? Students' procedural and conceptual problem solving in a CSCL environment designed within the field of science education. *International Journal of Computer-Supported Collaborative Learning, 3*(1), 25–52.

Krange, I. (2007a). Students' conceptual practices in science education. Productive disciplinary interactions in a participation trajectory. *Cultural Studies of Science Education, 2*, 171–203.

Krange, I. (2007b). Sociocultural perspectives on learning. *Cultural Studies of Science Education, 2*, 218–233.

Kumpulainen, K., & Wray, D. (2002). *Classroom interaction and social learning.* London, England: Routledge.

List, A., & Alexander, P. A. (2017). Cognitive affective engagement model of multiple source use. *Educational Psychologist, 52*, 182–199.

Markussen, E. (Ed.) (2010). Frafall i utdanning for 16-20 åringer i Norden. [Drop-outs in education among 16-20's in Norden]. *TemaNord* [ThemeNorth], *2010:517*, 11-57.

Markussen, E., & Sandberg, N. (2005). Hvorfor velger ungdom bort videregående? *Tidsskrift for samfunnsforskning* [Journal of social sciences]. Why do not youth choose high-school?], *5*(2), 91–96.

Mercer, N., Dawes, L., Wegerif, R., & Sams, C. (2004). Reasoning as scientist: Ways of helping children to use language to learn science. *British Educational Research Journal, 30*(3), 359–377.

Mercer, N. (1995). *The guided construction of knowledge: Talk amongst teachers and learners.* Clevedon: Multilingual Matters.

Murphy, P. K., Firetto, C. M., Wei, L., Li, M., & Croninger, R. M. V. (2016). What REALLY works: Optimizing classroom discussions to promote comprehension and critical–analytical thinking. *Policy Insights from the Behavioral and Brain Sciences, 3*, 27–35.

Norwegian Directorate for Education and Training. (2009). *Curriculum in history—Joint subjects in study preparatory education programs: Purpose.* Retrieved from https://www.udir.no/kl06/HIS1-02/Hele/Formaal.

Rajala, A., Hilppö, J., & Lipponen, L. (2012). The emergence of inclusive exploratory talk in primary students' peer interaction. *International Journal of Educational Research, 53*, 55–67.

Rasmussen, I., Gilje, Ø., Ferguson, L., Ingulfsen, L., & Bakkene, H. (2014). *Kildearbeid, ideologier og oppgaveforståelse i historie—En casestudie i prosjektet ARK&APP, samfunnsfag, videregående*. [Source work, ideologies and task understanding in history – A case study in project ARK&APP, Social Studies, High School]. Oslo, Norway: Reprosentralen, UiO. Retrieved from www.udir.no

Rasmussen, I., Krange, I., & Ludvigsen, S. R. (2003). The process of understanding the task: How is agency distributed between students, teachers and representations in technology-rich learning environments? *International Journal of Educational Research, 39*, 839–849.

Resnick, L. B., & F. Schantz. (2015). Re-thinking intelligence: Schools that build the mind. *European Journal of Education—Research Development and Policy, 50*(3), 340–349.

Stahl, S. A., Hynd, C. R., Britton, B. K., McNish, M. M., & Bosque, D. (1996). What happens when students read multiple source documents in history? *Reading Research Quarterly, 31*, 430–456.

Stenning, K., Greeno, J. G., Hall, R., Sommerfeld, M., & Wiebe, M. (2002). Coordinating mathematical with biological multiplication: Conceptual learning as the development of heterogenous reasoning systems. In Brna, P., Baker, M., Stenning, K., & Tiberghien, A. E. (Eds.), *The role of communication in learning to model* (pp. 3–48). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.

Strømsø, H. I., Bråten, I., Britt, M. A., & Ferguson, L. E. (2013). Spontaneous sourcing among students reading multiple documents. *Cognition and Instruction, 31*(2), 176–203. Retrieved from http://www.tandfonline.com/doi/pdf/10.1080/07370008.2013.769994

van Boxtel, C., & van Drie, J. (2013). Historical reasoning in the classroom: What does it look like and how can we enhance it? *Teaching History, 150*, 44–52.

van der Pol, J., Volman, M., & Beishuizen, J. (2010). Scaffolding in teacher–student interaction: A decade of research. *Educational Psychology Review, 22*, 271–296.

Vygotsky, L. (1978). *Mind in society. The development of higher psychological processes*. Cambridge, MA: MIT Press.

Wegerif, R. (2018). A dialogic theory of teaching thinking. In L. Kerslake & R. Wegerif (Eds.), *Theory of teaching thinking. International perspectives.* (pp. 89–104). New York, NY: Routledge.

Wertsch, J. (1991). *Voices of the mind. A socio-cultural approach to mediated action.* Cambridge, MA: Harvard University Press.

Wineburg, S. (1991). Historical problem solving: A study of the cognitive processes used in the evaluation of documentary and pictorial evidence. *Journal of Educational Psychology, 83*, 73–87.

Wood, D., Bruner, J. S., & Ross, G. (1976). The role of tutoring in problem solving. *Journal of Child Psychology & Psychiatry & Allied Disciplines, 17*, 89–100.